



ORCHIDS OF NICARAGUA

FIELD GUIDE

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By
Eric P. van den Berghe
Biologist
and
Ivette Gurdíán de van den Berghe
Consultant

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Content

Presentation by the Minister of MARENA	1
Orchids of Nicaragua	3
Acknowledgments	3
Foreword	3
Orchid Pollination	4
Rescuing Orchids	5
How to Plant	5
Orchid Habitat	6
Checklist of Nicaraguan Orchids	7
The Orchids	25
Bibliography	150
Internet References	155
List of Recent Taxonomic Changes • Genera	156
List of Recent Taxonomic Changes • Species	157
Studied Areas	160
Glossary	162
Photos and Location Maps	169
Photo Credits	A215



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Acknowledgments

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Foreword

As part of the CAFTA-DR free trade agreement, the US Government is providing assistance to the Central American countries to address environmental concerns through an "Environmental Cooperative Agreement" (ECA). Under this agreement, specific resources are being provided by the U.S. Government to address Nicaraguan environmental priorities. In this context, in 2006, USAID worked with MARENA began the process of addressing priority projects identified by the Government of Nicaragua. Of the four components of the ECA is "Theme B" – which addresses Biodiversity and Conservation. In this area, MARENA identified the need to develop "Orchids of Nicaragua Field Guide".

The present book is intended as a general guide to identify orchids of Nicaragua and to help improve our understanding of their distributions in the country. After some deliberation, on how to organize the book for maximal utility, we have opted for alphabetical sequence following the (somewhat failed) example of Hamer (Vol. 1-6 1982-1985), and more successful (Hamer 2001) and more recently, Morales (2001), Holliman (2002), Puplin (2002, 2005), Muñoz and Velasquez (2006), Ossenbeger et al. (2007). This does not make a lot of taxonomic sense, (See Dressler 1981, 1986, 1993b) but simplifies locating particular species. The down side of this is, however, that orchid taxonomy is still evolving (Dodson, 1975, Rasmussen 1977, Renz 1980, Luer 1986a,b,c, 1988,1990, Pridgeon 1978,1982 Siegerist 1986,, Withner 1988a,b 1998, Romero 1990 Dressler 2003, Withner and Harding 2004, Ossenbeger et al. 2007), thus we attempt to integrate most of the recent taxonomic changes albeit in some groups, e.g Schomburgia/ Myrmecophilum, Pleurothallinae, stetis, there is not widespread agreement (Withner, 1991, Fanfani and Rossi 1999, Hamer 2001). Here, we try to incorporate most of the recent changes, and make reference to their previous status or to those synonyms that have seen recent usage, but we do not give a complete treatment of old synonyms and original descriptions; for this information we refer the reader to Hamer, (1982 a,b,1983 1984 a,b, 2001) and to Ames and Corell (1985).

Some popular botanical field guides arrange flowers by color which works for total neophytes, but splits up genera and even species which occur in yellow and purple or white and purple morph or even fresh vs. old flowers. We prefer to keep the variants of a single species together. Often it is necessary to identify species without a flower and here it is best if members of a genus are together. We also considered a division between epiphytic vs. terrestrial and alphabetic within each of those, but again decided that this might create confusion as some genera have terrestrial as well as epiphytic species, and we prefer to keep all members of one Genus together for ease of comparison. Another consideration was how much detailed description to include; here we opt for a middle ground, giving measurements and salient characters to supplement photos. Although

we have made an effort to include all species that have been reported for Nicaragua and to show flower, plant habit, and seed capsules for most, there are some cases where we strongly suspect that the original report may be mistaken, or what are reported as several species by different authors may be synonyms, we indicate this in the corresponding text, but remain faithful to species reported by recognized authorities. We have added about a dozen species not previously reported for Nicaragua, including some which previous authors consider to be synonyms, but others consider to be valid, and finally we include several entirely new species. We also include some non-native species which have established wild populations in Nicaragua and make a note of the non-indigenous origins of the species in the corresponding text. If anyone finds species not presently represented, please document it with photographs as well as retain tangible evidence such as flowers preserved in alcohol and/or a pressed specimen to deposit in a recognized herbarium (for Nicaragua: UCA-Managua, UNAN-Leon) for future study.

Species distributions are given to the extent they are known, green dots represent the authors' records. Red dots represent literature reports or records prior to 1980 and remain to be confirmed, not because of doubt on the identification, but rather, because the habitat has suffered degradation. We refrain from including specific locality information: for example "Datanli-El Diablo" or any other locality will include the peak and several kilometers in any direction so that really, we are talking some 25 square kilometers. We do this as past abuses of collectors and specifically exporters have harmed many wild populations, and there are still no adequate controls in place to assure that such abuses do not continue. In fact, financing for this work was inspired because the Nicaraguan customs branch and CITES personnel were frustrated by the lack of expertise on staff to adequately control the trade both at the national and international levels. It is with this in mind that we include not only the picture of the flower but also the plant habit and seed capsules, as many, if not most plants that are encountered will not conveniently be in flower. While it is not a problem to rescue orchids from fallen trees or limbs (see section dedicated to this), most orchids transplanted to collections at lower elevations eventually die, and even well kept collections can be entirely lost if they are neglected for a year. It is best if the plants are admired in nature and left. Even if the plant does not die outright, many plants that flower beautifully in the wild cease to flower when moved to slightly different conditions, or conversely, flower beautifully as a prelude to dying.

We comment on rarity but we caution that this is an entirely subjective assessment and many species that are rare in one place may be common elsewhere, or very common in a small area that is extremely vulnerable. It is safe however, to conclude that the more localities we report a species as occurring, the more common.

Although much emphasis focuses on collectors who abuse or even go so far as to cut down trees to access the orchids, far greater numbers are lost with the progression of the agricultural frontier, habitat degradation, and "range maggots" an accurate descriptor of cattle, sheep, and goats. Therefore, while it is important to control the pillage of commercial collectors,

it is even more critical to protect the habitat. Interestingly, in many of the advanced collections I visited, not only were the growers dividing plants as they out-grew pots etc, but also in several cases, hundreds of small plants could be seen growing on nearby trees, the result of seeds released by the orchids grown in captivity without fancy laboratories and agar cultures. On a national level, while there is no organized orchid society, there are dozens of collectors and several commercial retailers. The only commercial operation which grows orchids in greenhouses focuses on exotic species or hybrids that tend to have spectacular long-lasting flowers; these pose no threat to the indigenous species and are by far preferable over wild Nicaraguan orchids for those who want pretty flowers to display. Such operations should by all means be encouraged and their efforts to bring in additional varieties facilitated as this takes pressure off the wild indigenous species.

The other national commercial sellers vary in their ethical standards and levels of knowledge. Mostly, the focus is to get the plant, or lots of them, and make money with no regard to the well-being of the plant. This trade needs to be regulated and limited to individuals who can demonstrate 1) that they know how to care for the plants prior to sale, and 2) will make an effort advise clients on what the habitat requirements are of the plants they sell. Any seller whose plants are visibly suffering should not be in business. It is not our intention here to condemn any individuals in particular, but it is a real tragedy when one goes by a place one week and there is a spectacular plant on display at roadside only to see the same plant sun-burned and virtually dead a week or two later, or to see plants for sale that have been ruthlessly cut from their base with no regard for roots as these are likely to die despite best efforts and may take years to recover fully and prosper. One particularly ignorant seller in fact has two compost piles where the unsold and uncared-for plants go after a few weeks of display, or simply wind up there because it is small and does not much catch the fancy of this seller. Sadly, we have found no less than four examples of *Oncidium splendidum* – one of the rarest and most spectacular orchid species in the country languishing in said compost pile until we rescued them.

Doubtless there are still interesting discoveries to be made, as we make no pretense of having thoroughly investigated the country. In fact, several of the most promising areas such as the highest mountain in the country, Mogotón, have not been accessible for several decades due to land mines. Other areas that have been cleared of mines have also very rapidly been stripped of their vegetation, especially in the Cordillera de Dipilto. In yet other areas, such as Carazo, the large trees are felled much faster than they can be replaced, leading to gradual but insidious degradation. Documenting the diversity of Nicaragua is a race against time and one where diffusion of information is wanting. We hope the present work will provide an accessible baseline for amateurs, conservationists, park guides, customs agents, and tourists.

Orchid Pollination

Orchids are well known for their unusual, highly host-specific and elaborate pollination mechanisms, Darwin himself dedicated a book to the subject (Darwin, 1888). For a more thor-

ough treatment of the subject, we refer the reader to Roubik and Hansen 2004 (who also gives an additional 300 plus references on this fascinating subject) and to Alcock (2006). While we have not focused specifically on the study of these, we have taken advantage of those opportunities that presented themselves to document pollination which is typically only possible in situ – moving orchids to orchidariums outside the normal habitat of the species typically also eliminates the pollinators. The extreme host specificity sometimes limited to single species of euglossine bees, dipterans, coleoptera etc. is achieved largely with highly specific pheromones odorless to us (Kaiser 1993), but highly attractive to MALE target insects. Male bees are not known for their industriousness as gathering pollen or honey goes, so the orchid needs a delivery system to ensure that the pollen is carried between flowers. This is best observed in *Catacetrinae* (Romero and Nelson 1986) which produce separate male and female flowers. The plant typically produces many more male than female inflorescences and when the male flowers open they are literally mobbed by dozens of males from just after daybreak (fig --), peaking within an hour after daybreak and terminating two to four hours after dawn. Male flowers often last only a day or two and using a spring-loaded delivery system, attach pollinia to the thorax of a male bee. Each flower produces a single pollinium and after that has been delivered the flower withers in a day or two. The pollinia are adhesive and will ride on the bee for several days. Female flowers are far less common but remain attached and atrophy after pollination. Male bees will continue to visit them for several days post pollination. Other orchids, eg. *Lycaste*, *Gongora*, *Clowesia* etc. receive visits by solitary pollinators around midday. We are still not quite sure what was going on with *Encyclia chacaoensis* with dozens of Lepidoptera mobbing it for several days, the encyclias were pollinated, but we did not see the same phenomenon in other flowering plants of the same species in the general area. As the pollinators for most species are found only in-situ there is doubtless still a lot to be learned about pollination mechanisms.

Orchid pests: Aphids are common on inflorescences and can lead the plant to abort a flowering attempt or individual blossoms to drop. It is a good idea to inspect the developing inflorescence regularly for aphids which can be treated by spraying them with a solution of soapy water or manual removal. Hemipterans are more troublesome and may require fumigation with insecticides. Hemiptera damage is easy to recognize as it leaves characteristic scars pseudobulbs and leaves. Unlike aphids, the hemiptera are agile, disperse, run, fly, hide and can be quite common. They seem to be partial to the pseudobulbs of *Laelia*, *Prosthechea*, *Epidendrum*, *Catacetrinae* and to the leaves of *Stanhopniidae* and but also ravage other Genera. Other indications of problems: Rats can be partial to the bulbs of *Gongora* on one occasion, I saw a rat eat dozens of *Gongora* pseudobulbs and kill several plants in a few weeks.

Fungus and Bacteria are also threats, especially when moisture levels exceed the norm, and when there is fresh vegetative growth, and when there is root damage. Also when drainage is inadequate, roots and pseudobulbs decay. During the wet season, it may be necessary to move the more mesic plants to drier locations. When fresh growth is present, keep the new

shoot dry but water the roots. However roots in standing water will also rot. This is less a problem with special orchid pots than it is with regular flower pots that have only small drainage holes. These holes may become plugged from below simply by virtue of standing in soil. Untreated plants may perish; treatment consists of first reducing exposure to moisture, pruning the affected leaf or part of the plant, and fumigation with anti-fungal sulfur based spray.

Rescuing Orchids

While it is never advisable to remove orchids from trees where they are doing well, it is however a good idea to move or rescue epiphytic plants that have fallen to the forest floor as these are almost invariably doomed to die in a few weeks or months. Two factors come into play: light and water. Simply picking up the plant and propping it up in the nearest tree fork typically does not help much because plants that live in the canopy are exposed to high levels of light, which is virtually absent on the forest floor. The second problem is that the canopy plants receive frequent precipitation, but also dry out quickly, such that the roots are not accustomed to persistent high moisture levels as happens when in contact with the forest soil which rots the roots.

Choosing and handling the plants: On finding a plant with roots still attached to the original substrate, it is best not to damage the roots, thus, take it with the branch or the original substrate. Avoid as much as possible cutting roots as this will handicap the plant considerably by allowing a point of entry for pathogens and dehydration. Cloth or woven mesh bags are good for temporary storage or moving the plants, but plastic bags are a poor choice, as plastic bags left in the sun can cook the plants in a short time. Species found in cooler alpine environments are especially sensitive to temperature changes, especially small species. In general, the larger the plant and the better condition it is in, the more likely it will survive transplant. One also needs to be careful not to subject potted plants to excess humidity where excess humidity cannot escape, it is better for the plant to be too dry for a few days than to be soaked for an extended period.

How to Plant

a) Pot. Clay pots are preferable over plastic in the long run, but plastic has the advantage for subsequent transplants or divisions. Also, since the entire pot can be moved, it is easy to experiment and find the right combination of light and moisture. Good drainage is especially important for pots whose traditionally small holes easily get plugged up. The planting medium (with exception of terrestrial species) typically includes anything but soil. Styrofoam, lava rock, coconut husk, sphagnum, tree fern fiber, mica etc. In various combinations all achieve the same result in giving something to adhere to with minimal moisture retention and good aeration.

b) Epiphytic orchids don't typically adhere to just any tree, rather certain types are favored... smooth bark is difficult, whereas thick, rough, porous bark typically favors the adhesion of roots. Nonetheless, there are exceptions, for example *Compantia*, *Ionopsis* and *Leochilus* typically favor the smooth

bark of Guava trees albeit on the smaller branches, the roots wrap around. Initially, it may be necessary to help the plant adhere by tying or wiring the plant into place. The wire should not contact the plant tissue directly; a buffer of coconut husk is useful here. The disadvantage is that once the plant is mounted on a tree they are hard to move without damage to the plant. They may also be mounted on a piece of wood but the disadvantage of this is that, wood, once dead, decays in couple of years or the bark rots and the orchid roots die back and the plant goes downhill fast. Wire or string used on live trees, should be a temporary measure until the roots adhere, at which time they are removed so as not to strangle or cut into the host plant.

c) Another alternative are Spanish tile which are very durable and drain well, but not all orchids do well on them. It is also important especially among the Stanhopinidae and other species with pendulous inflorescence that grows down to allow for spaces in which the inflorescence can penetrate to grow downward and hang loosely. Sometimes it is useful to mount two halves back to back forming a ball which can be suspended and having the roots of the two halves grow together. This allows for maximal flexibility for the plant to bring forth flowers without obstacles.

The plant should be relocated at similar altitudes/climate to that where it was originally found. Abrupt climate changes are typically deleterious. Also, if the roots are damaged, more frequent watering is advisable to facilitate recovery during dry periods. Dead foliage and bulbs are best removed to prevent the spread of fungus and treatment with sulfur based fungicides is recommended to prevent spread. Some fungal attacks, once inside the plant are difficult to control.

For more detailed instructions on care of specific genera, dividing plants etc. we refer the reader to Ritterhausen and Ritterhausen (2000) or Suarez and Bolaños (2007).

Orchid Habitat

While different species of orchid can be found in a variety of habitats, and the standard for classifying this are the Holdredge life zones (Holdredge 1971, 1973), we present here a simplified scheme for the non-technical reader for the purposes of the present work. Below is a list of terms we use to describe habitat and a more detailed description of what we mean by each, in the text we just use the terms.

Roadside cuts: these are typically in full sunlight but steep, thereby protecting terrestrial plants from cattle, goats, and sheep which typically destroy any plant they can access.

Open fields/meadows: These are temporary to more-or less permanent clearings or abandoned fields typified by vegetation that is less than a meter tall for the most part.

Isolated trees: These are areas that were once forested but are now predominantly coffee plantations, open field, or even pasture.

Forest understory: On or near the ground, surviving in low light levels where a much higher canopy is blocking 70 to 90% of direct sunlight.

Forest canopy: These are the upper branches in a dense forest; these are typically exposed to a lot of light and wind on a regular basis.

Forest edge: Similar conditions to forest canopy, but closer to the ground and more accessible.

Atlantic rain forest: Typically receiving more than 1000- 2500 mm. of precipitation, characterized by tall straight evergreen trees, flat land, poor soil, and about 80% or more shade cover on the forest floor.

Cloud forest: Typically receiving 1000 - 2500 mm. or more as a combination of rain and mist, evergreen heavily laden with epiphytes.

Premontaine: This encompasses land typically receiving 500-1000 mm of rain, but unevenly spread. This typifies the western portion of Nicaragua where there is abundant moisture for four to six months of the year interspersed with fairly dry periods during which the trees shed their leaves. Epiphytes are present but scarce and typified by thick leathery leaves.

Pine-oak forest: 500-1000 mm rain, with characteristics that do not favor water retention, well drained, typically oak or pine with spanish moss (*Tillandsia sp.*), or rocky thorny scrub.

Dry forest/Savanna: Very open plains with sparse tree cover typified by low wide canopy, branching close to the ground and very spiny vegetation, dry with almost no rain for six months or more.

Gallery forest: Typically, ribbons of large trees along waterways surrounded by dry forest.

0-500 meters: This is the warmest zone with daytime temperatures often in the 30-40 C range.

500-1000 meters: Typically 3-5 degrees Celsius cooler than the above.

Above 1000 meter: Typical Daytime temperatures between 20 and 25 C i.e., another 5+ degree drop.

CHECKLIST OF NICARAGUAN ORCHIDS

Scientific Name	Author	Flower	Pod	Habitat
<i>Acianthera breedlovi</i>	Soto Arenas, Solano & Salazar 2002			
<i>Acianthera circumplexa</i>	(Lindl.) Pridgeon & M.W. Chase 2001			
<i>Acianthera cogniauxiana</i>	(Schltr.) Pridgeon & M.W. Chase 2001	•	•	•
<i>Acianthera hondurensis</i>	(Ames) Pridgeon & M.W. Chase 2001			
<i>Acianthera pantasmi</i>	(Rchb.f.) Pridgeon & M.W. Chase 2001	•	•	•
<i>Acianthera pubescens</i>	(Lindl.) Pridgeon & M.W. Chase 2001	•	•	
<i>Acianthera verecunda</i>	(Schltr.) Pridgeon & M.W. Chase 2001			
<i>Ada chlorops</i>	(Endres & Rchb.f.) N.H. Williams 1972	•	•	
<i>Arpophyllum alpinum</i>	Lindl. Benth & Pl. Hartw 1842	•	•	•
<i>Arpophyllum giganteum</i>	Lindl. 1840	•	•	•
<i>Arpophyllum spicatum</i>	Lex. 1825	•	•	•
<i>Arundina graminifolia</i>	(Dan.) Hochr. 1910.	•	•	•
<i>Aspasia epidendroides</i>	Lindl. 1834	•	•	•
<i>Aspasia principissa</i>	Rchb.f. 1852	•	•	•
<i>Barbosella dolichorhiza</i>	Schltr. 1920			
<i>Barbosella orbicularis</i>	Luer 1976	•		
<i>Barbosella prorepens</i>	(Rchb.f.) Schltr. 1919	•	•	
<i>Barbosella reichembachiana</i>	(Endres & Rchb.f. 1875)	•	•	
<i>Barkeria obovata</i>	(Presl.) Christenson 1988	•	•	•
<i>Barkeria spectabilis</i>	Batem. ex Lindl. 1842	?		
<i>Baskervilla colombiana</i>	Garay 1953	•		
<i>Benzyngia reichembachiana</i>	(Schltr.) Dressler 2005			
<i>Beloglottis costaricensis</i>	(Rchb.f.) Schltr. 1920	•	•	
<i>Beloglottis Hameri</i>	Garay 1981	•	•	
<i>Beloglottis mexicana</i>	Garay & Hamer	•	•	
<i>Bletia campanulata</i>	La Llave & Lex. 1825			
<i>Bletia purpurata</i>	A. Rich & Gal. 1845	•	•	
<i>Bletia purpurea</i>	(Lam.) DC. 1841	•	•	
<i>Bletia roezlii</i>	Rchb.f. 1877	•	•	•
<i>Brachiomidium folsomii</i>	Dressler 1982	•	•	•
<i>Brachiomidium valerioi</i>	Ames & Schweinf. 1930			
<i>Brachystele guyanensis</i>	(Lindl.) Schltr. 1920			
<i>Brassavola cucullata</i>	(L.) R.Br. 1813	•	•	•
<i>Brassavola grandiflora</i>	Lindl. 1839	•	•	•
<i>Brassavola nodosa</i>	(L.) Lindl. 1831	•	•	•
<i>Brassavola venosa</i>	Lindl. 1840	•	•	
<i>Brassia caudata</i>	(L.) Lindl. 1827	•	•	•

Scientific Name	Author	Flower	Pod	Habitat
<i>Brassia gireoudiana</i>	Rchb.f. & Warsz. 1854	•		
<i>Brassia maculata</i>	R.Br. 1813	•		
<i>Brassia signata</i>	Rchb.f. 1881	•		
<i>Brassia verrucosa</i>	Lindl. 1840	•	•	•
<i>Bulbophyllum aristatum</i>	(Rchb.f.) Hemsl 1883	•		
<i>Bulbophyllum pachyrachis</i>	(A. Rich) Hemsl. 1864	•	•	•
<i>Calanthe calanthoides</i>	(A. Rich. & Gal) Hamer & Garay 1974	•	•	
<i>Campylocentrum fasciola</i>	(Lindl.) Cogn. 1906	•	•	•
<i>Campylocentrum micranthum</i>	(Lindl.) Rolfe 1903	•	•	•
<i>Campylocentrum schiedei</i>	(Rchb.f.) Benth.ex Hemsl. 1884	•	•	•
<i>Catasetum integerrimum</i>	Hook 1840	•	•	•
<i>Catasetum maculatum</i>	Kunth 1822	•	•	•
<i>Caularthron bilamellatum</i>	(Rchb.f.) R.E.Schlut. 1958	•	•	•
<i>Chaubardiella subquadrata</i>	(Schltr.) Garay 1969	•		
<i>Chelyorchis ampliata</i>	(Lindl.) Dressler & N.H Williams 2000	•	•	•
<i>Chondylorhyncha estrellensis</i>	Ames 1923			
<i>Chysis bractescens</i>	Lindl. 1840	•		
<i>Chysis bruennowiana</i>	Rchb.f. & Warsz. 1857	•		
<i>Chysis laevis</i>	Lindl. 1840	•	•	•
<i>Chysis tricotata</i>	Schltr. 1923	•	•	•
<i>Clowesia russeliana</i>	(Hook.) Dodson 1975	•	•	•
<i>Coccinorchis bracteosa</i>	(Ames & C.Schweinf.) Garay 1982			
<i>Coccineorchis standleyi</i>	(Ames) Garay 1982	•	•	
<i>Coccineorchis warszewicziana</i>	Szlach. Rutk.& Mythik 2004			
<i>Cochleanthes flabelliformis</i>	(Sw.) R.E. Schult & Garay 1959	•	•	•
<i>Coelia macrostachya</i>	Lindl. 1842	•	•	
<i>Cohniella ascendens</i>	(Lindl.) Christenson 1999	•	•	•
<i>Cohniella cebolleta</i>	(Jacq.) Christenson 1999	•	•	•
<i>Cohniella nuda</i> ssp. <i>stipitata</i>	(Lindl.) Dressler & N.H.Williams 2003/?			
<i>Comparettia falcata</i>	Poepp.& Endl. 1835	•	•	
<i>Corallorhiza bulbosa</i>	A.Rich.&Gal. 1845			
<i>Corallorhiza odontorhiza</i>	(Willd.) Nutt. 1818			
<i>Coryanthes gracilis</i>	Gerlach 1993	•	•	
<i>Coryanthes picturata</i>	Rchb.f. 1862			
<i>Corymborkis forcipigera</i>	(Rchb.f.) L.O. Williams 1946	•	•	•
<i>Cranichis ciliata</i>	(Kunth.) Kunth. 1822			
<i>Cranichis diphylla</i>	(Kunth.) Kunth. 1822			
<i>Cranichis resoluta</i>	Hamer&Garay 1982	•		
<i>Cranichis sylvatica</i>	A.Rich.&Gal. 1845			
<i>Cranichis wagneri</i>	Rchb.f. 1876	•	•	•
<i>Crossoglossa fratum</i>	(Schltr.) Dressler 1994	•	•	
<i>Crossoglossa tipuloides</i>	(Lindl.) Dodson 1994	•	•	•

Scientific Name	Author	Flower	Pod	Habitat
<i>Cryptarrhena guatemalensis</i>	Schltr. 1911	•		
<i>Cryptarrhena lunata</i>	R. Br. 1816	•		
<i>Cryptocentrum latifolium</i>	Schlechter 1923	•		
<i>Cuitlauzina anceps</i>	Schltr. 1923			
<i>Cuitlauzina egertonii</i>	(Lindl.) Dressler & N.H. Williams 2003			
<i>Cuitlauzina pulchella</i>	(Batem.ex Lindl.) Dressler & N.H.Williams 2003			
<i>Cyclopogon comosa</i>	(Rchb.f.) Burns-Bal. & E.W. Greenw. 1986	•	•	•
<i>Cyclopogon cranichoides</i>	(Griseb.) 1920	•	•	
<i>Cyclopogon elatus</i>	(Sw.) Schltr. 1919	•	•	
<i>Cyclopogon miradorensis</i>	Schltr. 1925	•	•	
<i>Cyclopogon obliquus</i>	(J.J.Sm.) Szlach. 1994	•	•	
<i>Cyclopogon prasophyllus</i>	(Rchb.f.) Schltr. 1920	•	•	•
<i>Cynoches egertonianum</i>	Batem. 1842	•	•	•
<i>Cynoches guttulatum</i>	Schltr. 1922	•		
<i>Cynoches pachydactylon</i>	Schltr. 1922			
<i>Cynoches stenodactylon</i>	Schltr. 1922	•	•	•
<i>Cynoches ventricosum</i>	Batem. 1837	•	•	•
<i>Cyrtorchiloides ochmatochila</i>	(Rchb.f.) N.H.Williams & M.W. Chase 2001			
<i>Cyrtopodium macrobulbon</i>	(La Llave & Lex.) G.A. Romero & Carnevali 1999	•	•	
<i>Deiregyne hemichrea</i>	(Lindl.) Schltr. 1920	•	•	•
<i>Dichaea brachypoda</i>	Rchb.f. 1866	•	•	
<i>Dichaea dammeriana</i>	Krzel. 1923			
<i>Dichaea fragrantissima</i> ssp. <i>eburnea</i>	Dressler & Pupulin 2001	•	•	•
<i>Dichaea glauca</i>	(Sw.) Lindl. 1833	•	•	•
<i>Dichaea graminoides</i>	(Sw.) Lindl. 1833	•	•	
<i>Dichaea hystricina</i>	Rchb.f. 1865	•	•	•
<i>Dichaea morrisii</i>	Fawc. & Rendle, J. 1910	•	•	
<i>Dichaea muricatoides</i>	Hamer & Garay 1974	•		
<i>Dichaea neglecta</i>	Schltr. 1918	•	•	
<i>Dichaea panamensis</i>	Lindl. 1833	•	•	
<i>Dichaea pendula</i>	(Aubl.) Cogn., 1903	•	•	•
<i>Dichaea poicillantha</i>	Schltr. 1923	•	•	
<i>Dichaea trichocarpa</i>	(Sw.) Lindl., 1933	•	•	
<i>Dichaea trulla</i>	Rchb.f., 1866	•	•	
<i>Dichaea tuerckheimii</i>	Schltr. 1916	•	•	•
<i>Dimerandra emarginata</i>	(G.F.W. Meyer) Hoehne , 1934	•	•	•
<i>Dimerandra lamellata</i>	Lindl. 1843	•		
<i>Dimerandra latipetala</i>	Siegerst 1985	•		
<i>Dinema polybulbon</i>	(Sw.) Lindl., 1831	•	•	•
<i>Domingoa purpurea</i>	(Lindl.) van den Berg & Soto Arenas 2007	•	•	•
<i>Dracula pusilla</i>	(Rolfe) Luer 1978	•	•	•
<i>Dracula vespertilio</i>	(Rchb.f.) Luer 1978	•	•	

Scientific Name	Author	Flower	Pod	Habitat
<i>Dresslerella hispida</i>	(L.O. Wms.) Luer. 1976	•	•	•
<i>Dresslerella pilosissima</i>	(Schltr.) Luer 1979			
<i>Dressleria dilecta</i>	(Rchb.f.) Dodson 1975	•	•	
<i>Dressleria eburnea</i>	(Rolfe) Dodson 1975			
<i>Dressleria helleri</i>	Dodson 1975	•		
<i>Dryadella guatemalensis</i>	(Schltr.) Luer 1978	•	•	
<i>Dryadella odontostele</i>	Luer 1996	•		
<i>Dryadella simula</i>	(Rchb.f.) Luer 1978	•	•	•
<i>Dryadella sororcula</i>	Luer 1996			
<i>Echinosepala lappiformis</i>	(A. Heller & L.O. Williams) Pridgeon & M.W. Chase 2002			
<i>Echinosepala uncinata</i>	(Fawc.) Pridgeon & Chase 2002	•	•	•
<i>Elleanthus alberti</i>	Schltr. 1923	•	•	•
<i>Elleanthus aurantiacus</i>	(Lindl.) Rchb.f. 1862	•	•	
<i>Elleanthus caricoides</i>	Nash 1907	•	•	•
<i>Elleanthus cynarocephalus</i>	(Rchb.f.) Rchb.f. 1862	•	•	•
<i>Elleanthus discolor</i>	(Rchb.f. & Warsz.) Rchb.f. 1863	•		
<i>Elleanthus graminifolius</i>	(Barb. Rodr.) Lojtnant, 1977			
<i>Elleanthus hymenophorus</i>	Rchb.f. 1862	•	•	
<i>Elleanthus linifolius</i>	Presl. 1827			
<i>Elleanthus poiformis</i>	Schltr. 1923	•	•	
<i>Elleanthus stolonifer</i>	Barringer 1985			
<i>Elleanthus tonduzii</i>	Schltr. 1910	•		
<i>Elleanthus wercklei</i>	Schltr. 1923	•		
<i>Eltroplectris roseo-alba</i>		•	•	•
<i>Empusella endotrachys</i>	(Rchb.f.) Luer 2004			
<i>Encyclia alata</i>	(Batem.) Schltr. 1914	•	•	•
<i>Encyclia amanda</i>	(Ames) Dressler & Pollard 1971	•		
<i>Encyclia ambigua</i>	(Lindl.) Schltr. 1914	•	•	
<i>Encyclia belizensis</i>	(Rchb.f.) Schltr. 1918			
<i>Encyclia ceratistes</i>	(Lindl.) Schltr., 1919	•		
<i>Encyclia chiapaensis</i>	Withner & D.G. Hunt 1994	•	•	•
<i>Encyclia cordigera</i>	(H.B.K.) Dressler. 1964	•	•	•
<i>Encyclia cordigera roseum</i>	(Batem.) H.G. Jones 1969	•		
<i>Encyclia diota</i>	(Lindl.) Schtr., 1918	•	•	•
<i>Encyclia gravida</i>	(Lindl.) Schltr. 1918	•	•	•
<i>Encyclia guatemalensis</i>	(Klotzsch) Dressler & G.E. Pollard 1971	•		
<i>Encyclia lineariloba</i>	Withner 2001			
<i>Encyclia microbulbon</i>	(Hook) Schltr. 1918			
<i>Encyclia mooreana</i>	(Rolfe) Schltr. 1914	•	•	
<i>Encyclia nematocaulon</i>	(A. Rich.) Acuña 1939			
<i>Encyclia oestlundii</i>	(Ames, F.T. Hubb. & C. Schweinf.) Hagsater & Stermitz 1983			

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<i>Encyclia papillosa</i>	(Batem.) Ag.- Olav 1987	•		
<i>Encyclia parviflora</i>	(Rabel) Withner 1998			
<i>Encyclia peraltensis</i>	(Ames) Withner 1998			
<i>Encyclia selligera</i>	(Lindl.) Schltr. 1914	•		
<i>Encyclia spatella</i>	(Rchb.f.) Schltr., 1914			
<i>Encyclia stellata</i>	(Lindl.) Schltr. 1914			
<i>Encyclia suaveolens</i>	Dressler 1971	•		
<i>Encyclia trachycarpa</i>	(Lindl.) Schltr. 1918	•		
<i>Encyclia tuerckheimii</i>	Schltr. 1918			
<i>Epidendrum aberrans</i>	Schltr. 1918			
<i>Epidendrum acuña</i>	Dressler 1959	•		
<i>Epidendrum alabastratum</i>	Pollard & Hagsater 1978	•	•	•
<i>Epidendrum anceps</i>	Jacq. 1763	•	•	•
<i>Epidendrum arbuscula</i>	Lindl. 1842	•	•	•
<i>Epidendrum barbeyanum</i>	Krzt. 1894	•	•	•
<i>Epidendrum baumanianum</i>	Schltr. 1920	•	•	
<i>Epidendrum brachyrepens</i>	Hagsater 1999	•	•	
<i>Epidendrum cardiophilum</i>	L.O.Williams 1940	•	•	
<i>Epidendrum cardiophorum</i>	Schltr. 1911			
<i>Epidendrum carolii</i>	Schltr. 1923	•	•	
<i>Epidendrum centropetalum</i>	Rchb.f. 1852			
<i>Epidendrum chloe</i>	Rchb.f. 1856	•	•	
<i>Epidendrum chlorycorymbos</i>	Schltr. 1923	•	•	•
<i>Epidendrum ciliare</i>	L. 1759	•	•	•
<i>Epidendrum circinatum</i>	Ames 1924	•	•	
<i>Epidendrum cnemidophorum</i>	Lindl. 1853	•		
<i>Epidendrum comayagüense</i>	Ames 1933	•	•	
<i>Epidendrum congestoides</i>	Ames & Schwein. 1930	•	•	
<i>Epidendrum coriifolium</i>	Lindley 1851	•	•	•
<i>Epidendrum coronatum</i>	Ruiz&Pav. 1898			
<i>Epidendrum criniferum</i>	Reichm. 1871	•	•	
<i>Epidendrum cruciforme</i>	Hagsater & E. Santiago 2006			
<i>Epidendrum cyclolobum</i>	Hagsater & E. Santiago 2006			
<i>Epidendrum cystosum</i>	Ames 1934			
<i>Epidendrum eburneum</i>	Rchb.f. 1867	•	•	•
<i>Epidendrum eustirum</i>	Ames, Hubbs & Schweinf. 1935			
<i>Epidendrum firmum</i>	Rchb.f. 1866	•		
<i>Epidendrum flexicaule</i>	Schltr. 1918			
<i>Epidendrum flexuosum</i>	G. Mey 1818	•	•	
<i>Epidendrum fruticosum</i>	Pavon & Lindl. 1853	•	•	•
<i>Epidendrum galeottianum</i>	A. Rich & Gal 1845	•		
<i>Epidendrum glumarum</i>	Hamer & Garay 1985	•	•	

Scientific Name	Author	Flower	Pod	Habitat
<i>Epidendrum hameri</i>	Hagsater & L.Sanchez 1993			
<i>Epidendrum hellerianum</i>	Hawkes 1966			
<i>Epidendrum hunterianum</i>	Schltr. 1922	•	•	
<i>Epidendrum isomerum</i>	Schltr. 1906	•	•	•
<i>Epidendrum lacustre</i>	Lindl. 1855	•	•	•
<i>Epidendrum lagenocolumna</i>	Hagsater, Sanchez & Soldaña 1993	•	•	
<i>Epidendrum laucheanum</i>	Rolfe & Bonhof 1892	•	•	•
<i>Epidendrum macroclinum</i>	Hagsater 1988	•		
<i>Epidendrum mesocarpon</i>	Hagsater 1999			
<i>Epidendrum misserimum</i>	Rchb.f. 1855	•		
<i>Epidendrum mixtum</i>	Schltr. 1912	•	•	
<i>Epidendrum mora-retanae</i>	Hagsater 1993			
<i>Epidendrum nicaragiense</i>	Hagsater 1993	•		
<i>Epidendrum nocturnum</i>	Jacq. 1760	•	•	•
<i>Epidendrum octomerioides</i>	Schltr. 1907	•	•	
<i>Epidendrum oerstedii</i>	Rchb.1852	•	•	
<i>Epidendrum pansamalae</i>	Schtr. 1912	•	•	•
<i>Epidendrum paranthicum</i>	Rchb. 1852	•	•	
<i>Epidendrum parkinsonianum</i>	Hook 1842	•	•	•
<i>Epidendrum peperomia</i>	Rchb.f. 1854	•	•	•
<i>Epidendrum phragmites</i>	Heller & L.O.Willams. 1968	•	•	
<i>Epidendrum physodes</i>	Rchb.f. 1873			
<i>Epidendrum piliferum</i>	Rchb.f. 1876	•	•	
<i>Epidendrum polyanthum</i>	Lindl. 1831	•		
<i>Epidendrum propinquum</i>	Rich. & Gal. 1845			
<i>Epidendrum pseudoramosum</i>	Schltr. 1912	•	•	
<i>Epidendrum pudicum</i>	Ames 1923			
<i>Epidendrum radicans</i>	Pav. ex. Lindl. 1831	•	•	•
<i>Epidendrum ramosum</i>	Jacq. 1760	•	•	•
<i>Epidendrum raniferum</i>	Lindl. 1831	•	•	•
<i>Epidendrum repens</i>	Cogn. 1909	•	•	•
<i>Epidendrum santaclareense</i>	Ames 1923			
<i>Epidendrum schlechterianum</i>	Ames 1924	•		
<i>Epidendrum scriptum</i>	A. Rich. & Gal. 1844	•	•	
<i>Epidendrum sculptum</i>	Rchb.f. 1854			
<i>Epidendrum segoviense</i>	A.H. Heller 1968			
<i>Epidendrum selaginella</i>	Schltr. 1906	•	•	
<i>Epidendrum stamfordianum</i>	Batem. 1838	•	•	•
<i>Epidendrum stangeanum</i>	Rchb.f. 1881	•	•	
<i>Epidendrum strobiliferum</i>	Rchb.f. 1858	•	•	•
<i>Epidendrum trachythece</i>	Schltr. 1907	•	•	
<i>Epidendrum trialatum</i>	Hagsater 1984			

Scientific Name	Author	Flower	Pod	Habitat
<i>Epidendrum tridens</i>	Poepp. & Ende. 1838	•	•	
<i>Epidendrum triangulabium</i>	Ames & Schweinf. 1930			
<i>Epidendrum turialvae</i>	Rchb.f. 1871	•	•	•
<i>Epidendrum vulcanicola</i>	Hamer 1983	•		
<i>Epidendrum verrucosum</i>	Sw. 1799	•	•	•
<i>Erycina crista-galli</i>	(Rchb.f.) N.H.Williams. & M.W.Chase 2001	•	•	•
<i>Erycina gnomia</i>	(Kraenzl) N.H.Williams. & M.W. Chase 2001	•	•	
<i>Erycina pumilio</i>	(Rchb.f.) N.H.Williams. & M.W.Chase 2001			
<i>Erycina pusilla</i>	(L.) N.H.Williams. & M.W.Chase 2001	•	•	•
<i>Eulophia alta</i>	(L.) Fawc. & Rendle 1910	•	•	
<i>Eurystyles ananassocomus</i>	(Rchb.) Schltr. 1925	•	•	
<i>Galeandra dives</i>	Rchb.f.1854	•	•	•
<i>Galeottia grandiflora</i>	A.Rich. 1845	•	•	
<i>Góngora armeniaca</i>	(Lindl. & Paxton) Rchb.f. 1854	•	•	
<i>Góngora aromatica</i>	Rchb.f. 1854			
<i>Góngora cassidea</i>	Rchb.f. 1864	•	•	
<i>Góngora claviodora</i>	Dressler 1972	•	•	•
<i>Góngora leucochila</i>	Lem. 1845	•	•	•
<i>Góngora truncata</i>	Lindl. 1843	•	•	
<i>Góngora unicolor</i>	Schltr. 1923	•	•	
<i>Goniochilus leochilinus</i>	(Rchb.f.) M.W. Chase 1987	•	•	•
<i>Goodyera bradeorum</i>	Schltr. 1923	•	•	
<i>Goodyera erosa</i>	(Ames & Schweinf.) Ames 1934			
<i>Goodyera major</i>	Ames & Corell 1942	•	•	
<i>Govenia liliacea</i>	(La Llave & Lex.) Lindl. 1831	•	•	•
<i>Govenia mutica</i>	Rchb,f, 1852	•	•	•
<i>Govenia pupusii</i>	Schltr. 1918			
<i>Govenia utriculata</i>	(Sw.) Lindl. 1839	•	•	•
<i>Gracielanthus pyramidalis</i>	(Lindl.) R. Gonzalez & Szlach 1995			
<i>Guarianthe aurantiaca</i>	(Batem.+Lindl.) Dressler & W.E. Higgins 2003	•	•	•
<i>Guarianthe pattinii</i>	(Cogn.) Dressler & W.E. Higgins 2003	•		
<i>Guarianthe skinneri</i>	(Batem.) Dressler & W.E.Higgins 2003	•	•	•
<i>Guarianthe s. guatemalensis</i>	(T.Moore) W.E.Higgins 2004	•		
<i>Habenaria alata</i>	Hook. 1826			
<i>Habenaria clypeata</i>	Lindl. 1835			
<i>Habenaria distans</i>	Griseb. 1866	•	•	
<i>Habenaria entomantha</i>	(Lex.) Lindl. 1835	•	•	
<i>Habenaria eustackya</i>	Rchb.f. 1885	•	•	
<i>Habenaria floribunda</i>	Lindl. 1835	•	•	
<i>Habenaria jaliscana</i>	S. Watson 1887			
<i>Habenaria mesodactyla</i>	Griseb. 1864			
<i>Habenaria monorrhiza</i>	(Sw.) Rchb 1885	•	•	

Scientific Name	Author	Flower	Pod	Habitat
<i>Habenaria novemfida</i>	Lindl. 1842	•		
<i>Habenaria odontopetala</i>	Rchb.f. 1844	•		
<i>Habenaria oerstedii</i>	Rchb.f. 1855			
<i>Habenaria pringlei</i>	B.L. Rob. 1894			
<i>Habenaria quinqueseta</i>	(Michx.) Eaton 1829	•		
<i>Habenaria repens</i>	Nutt. 1818	•		
<i>Habenaria strictissima</i>	Rchb.f. 1844			
<i>Habenaria trifida</i>	Kunth 1815	•		
<i>Habenaria umbratilis</i>	Ames & L.O. Williams 1941			
<i>Habenaria wercklei</i>	Schltr. 1923			
<i>Haplorchis lineatus</i>	(Lindl.) Schltr. 1920			
<i>Helleriella nicaraguensis</i>	Hawkes 1966	•	•	
<i>Heterotaxis crassifolia</i>	Lindl. 1826	•	•	•
<i>Heterotaxis discolor</i>	(Lodd. ex. Lindl.) Ojeda & Carnevali 2005	•	•	•
<i>Heterotaxis maleolens</i>	(Schltr.) Ojeda & Carnevali 2005	•		
<i>Heterotaxis valenzuelana</i>	(Nash) Ojeda & Carnevali 2005	•	•	•
<i>Homalopetalum pumilio</i>	(Rchb.f.) Schltr. 1923	•		
<i>Houlettia tigrina</i> Linden ex.	Lindl. & Paxton 1853	•	•	•
<i>Huntleya burtii</i>	(Endres & Rchb.f.) Pfitzer 1889	•	•	•
<i>Ionopsis utricularoides</i>	(Sw) Lindl. 1821	•	•	•
<i>Ionopsis satyroides</i>	(Sw) Lindl. 1823	•		
<i>Isochilus aurantiacus</i>	Hamer & Garay 1981	•	•	
<i>Isochilus carnosiflorus</i>	Lindl. 1923	•	•	•
<i>Isochilus chiriquensis</i>	Schltr. 1922	•	•	
<i>Isochilus latebracteatus</i>	Rich. & Gal. 1845	•	•	
<i>Isochilus linearis</i>	(Jacq.) R. Br. 1813	•	•	•
<i>Isochilus major</i>	Cham. & Schltdl. 1831	•	•	
<i>Jacquinella cobanensis</i>	(Ames & Schltr.) Dressler 1966	•	•	
<i>Jacquinella equitantifolia</i>	(Ames) Dressler 1966	•	•	•
<i>Jacquinella globosa</i>	(Jacq.) Schltr. 1924	•	•	•
<i>Jacquinella teretefolia</i>	(Sw.) Britton & Wilson 1926	•	•	•
<i>Kefersteinia costarricensis</i>	Schltr. 1918	•	•	
<i>Kegelilla atropilosa</i>	L.O. Williams & Heller 1964	•	•	•
<i>Kraenzlinella erinacea</i>	(Rchb.f.) Luer 2004			
<i>Lacaena bicolor</i>	Lindl. 1843	•	•	
<i>Lacaena spectabilis</i>	(Klotzsch) Rchb.f. 1854	•	•	•
<i>Laelia rubescens</i>	Lindl. 1840	•	•	•
<i>Laelia superbiens</i>	Lindl. 1840	•	•	
<i>Leochilus johnsonii</i>	Ames & Corell 1843			
<i>Leochilus labiatus</i>	(Sw.) Kunze 1943	•	•	•
<i>Leochilus scriptum</i>	(Scheidw.) Rchb.f. 1843	•	•	•
<i>Lepanthes acuminata</i>	Schltr. 1912	•	•	

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<i>Lepanthes acuminata ssp. ernesti</i>	Salazar & Soto 1996			
<i>Lepanthes blepharistes</i>	Rchb.f. 1866	•	•	•
<i>Lepanthes costarricensis</i>	Schltr. 1923	?		
<i>Lepanthes distica</i>	(A. Rich & Gal.) Garay & R.E. Schluter 1959	•	•	
<i>Lepanthes edwardsii</i>	Ames 1933	•	•	
<i>Lepanthes exima</i>	Ames 1923	•	•	
<i>Lepanthes guanacastensis</i>	Ames & Schweinf. 1930			
<i>Lepanthes helleri</i>	A.D. Hawkes 1966	•	•	
<i>Lepanthes johnsonii</i>	Ames 1923			
<i>Lepanthes oreocharis</i>	Schltr. 1912			
<i>Lepanthes samacensis</i>	Ames 1923			
<i>Lepanthes stenophylla</i>	Schltr. 1912			
<i>Lepanthes turrialvae</i>	Rchb.f. 1855	•	•	
<i>Lepanthopsis floripectin</i>	Ames 1943			
<i>Liparis arnoglossophylla</i>	(Rchb.f.) Rchb.f. ex Hemsl. 1833	•	•	
<i>Liparis fantastica cordiformes</i>	(C. Schweinf.) L.O. Williams 1950			
<i>Liparis nervosa</i>	(Thunb. ex Murry) Lindl. 1830	•	•	
<i>Liparis vexillifera</i>	(Lex.) Cogn. 1895			
<i>Lockhartia amoena</i>	Endres & Rchb 1872	•	•	
<i>Lockhartia hercodonta</i>	Rchb, f. ex. Kraenzl. 1923	•	•	•
<i>Lockhartia micrantha</i>	Rchb.f. 1852	•	•	
<i>Lockhartia oerstedii</i>	Rchb.f. 1852	•		
<i>Lockhartia pittieri</i>	Schltr. 1913	•	•	
<i>Lophiaris altissimum</i>	(Jacq.) Braem 1993	•		
<i>Lophiaris aurosasinorum</i>	(Stadl. & L.O. Williams) Braem 1993	•	•	•
<i>Lophiaris carthagenense</i>	(Jacq.) Braem 1993	•	•	•
<i>Lophiaris luridum</i>	(Lindl.) Braem 1993	•		
<i>Lycaste angelae</i>	Oakeley 2008	•	•	
<i>Lycaste aromatica</i>	(Graham ex. Hook) Lindl. 1843	•	•	•
<i>Lycaste bradeorum</i>	Schltr. 1923	•	•	•
<i>Lycaste candida</i>	Lindl. ex. Rchb.f. 1866			
<i>Lycaste cochleata</i>	Lindl. 1851	•	•	•
<i>Lycaste consobrina</i>	Rchb.f. 1852			
<i>Lycaste deppei</i>	(Lodd.) Lindl. 1843			
<i>Lycaste dowiana</i> Endres &	Rchb.f. 1874	•	•	•
<i>Lycaste macrophylla</i>	(Poepp & Emdl.) Lindl. 1843	•		
<i>Lycaste macrophylla desboisiana</i>	Cogn. 1897	•		
<i>Lycaste suaveolens</i>	Summerhayes 1931			
<i>Lyroglossa pubicaulis</i>	(L.O. Williams) Garay 1982			
<i>Macradenia brassavolae</i>	Rchb.f. 1852	•	•	•
<i>Macroclinum bicolor</i>	(Lindl.) Dodson 1984			
<i>Macroclinum paniculatum</i>	(Ames & Schweinf.) Dodson 1984	•		

Scientific Name	Author	Flower	Pod	Habitat
<i>Malaxis aurea</i>	Ames 1923			
<i>Malaxis brachyrhynchos</i>	(Rchb.f.) Ames 1922	•	•	
<i>Malaxis brachystachya</i>	(Lindl.) Rchb.f. 1861			
<i>Malaxis carnosia</i>	(Kunth.) C. Schweinf. 1941			
<i>Malaxis excavata</i>	(Lindl.) Kunze 1893	•	•	•
<i>Malaxis fastigiata</i>	(Rchb.f.) Kunze 1891	•	•	•
<i>Malaxis histionantha</i>	(Link., Klotzsch & Otto) Garay & Dunsterv. 1976	•		
<i>Malaxis insperata</i>	Dressler 2003			
<i>Malaxis majamthemifolia</i>	Cham. & Schltdl. 1831			
<i>Malaxis soulei</i>	L.O. Williams 1834	•	•	
<i>Malaxis unifolia</i>	Michx. 1803			
<i>Malaxis wendlandii</i>	(Rchb.f.) L.O. Williams 1946			
<i>Masdevallia attenuata</i>	Rchb.f. 1871			
<i>Masdevallia chontalensis</i>	Rchb.f. 1878	•	•	•
<i>Masdevallia floribunda</i>	Lindl. 1843			
<i>Masdevallia molossoides</i>	Kraenzl 1921			
<i>Masdevallia nicaraguyae</i>	Luer 1979	•	•	
<i>Masdevallia nidifica</i>	Rchb.f. 1878	•	•	
<i>Masdevallia tonduzii</i>	Woolward 1906	•	•	
<i>Masdevallia tubuliflora</i>	Ames 1908	•	•	
<i>Maxillaria acervata</i>	Rchb.f. 1858	•	•	
<i>Maxillaria aciantha</i>	Rchb.f. 1852	•	•	•
<i>Maxillaria alba</i>	(J.D.Hook.) Lindl. 1832	•	•	
<i>Maxillaria anceps</i>	Ames & Schweinf. 1930	•	•	
<i>Maxillaria angustisegmenta</i>	Ames, Hubb. & Schweinf. 1930	•		
<i>Maxillaria angustissima</i>	Ames, Hubb. & Schweinf. 1934	•		
<i>Maxillaria brachybulbon</i>	Schltr. 1923	•	•	•
<i>Maxillaria brunnea</i> Linden &	Rchb.f. 1854	•	•	
<i>Maxillaria caespitifolia</i>	Rchb.f. 1877	•	•	
<i>Maxillaria cobanensis</i>	Schltr. 1912			
<i>Maxillaria confusa</i>	Ames & Schweinf. 1925	•	•	
<i>Maxillaria cucullata</i>	Lindl. 1840	•	•	•
<i>Maxillaria curtipes</i>	Hook 1841			
<i>Maxillaria densa</i>	Lindl. 1835	•	•	•
<i>Maxillaria diuturna</i>	Ames & Schweinf. 1925	•	•	
<i>Maxillaria elatior</i>	(Rchb.f.) Rchb.f. 1863	•	•	
<i>Maxillaria endresii</i>	Rchb.f. 1863	•		
<i>Maxillaria friedrichsthalli</i>	Rchb.f. 1852	•	•	
<i>Maxillaria fulgens</i>	(Rchb.f.) L.O. Williams 1941	•	•	
<i>Maxillaria hedwigae</i>	Hamer & Dodson 1982	•	•	
<i>Maxillaria houttiana</i>	Rchb.f. 1858			
<i>Maxillaria mombachoensis</i>	A.H. Heller ex. J.T. Atwood 1981	•	•	

Scientific Name	Author	Flower	Pod	Habitat
<i>Maxillaria moralesii</i>	Carnevali & J.T. Atwood 1996	•	•	•
<i>Maxillaria nagellii</i>	L.O. Williams & Corell, 1948			
<i>Maxillaria nasuta</i>	Rchb.f. 1866	•	•	•
<i>Maxillaria neglecta</i>	(Schltr.) L.O. Williams 1942	•	•	
<i>Maxillaria nicaraguensis</i>	(Hamer & Garay) J.T. Atwood 1946	•		
<i>Maxillaria oreocharis</i>	Schltr. 1922	•	•	
<i>Maxillaria pachyacron</i>	Schltr. 1911	•	•	
<i>Maxillaria paleata</i>	(Rchb.f.) Ames & Corell 1943	•		
<i>Maxillaria porrecta</i>	Lindl. 1838	•		
<i>Maxillaria praestans</i>	Rchb.f. 1885	•	•	•
<i>Maxillaria punctostriata</i>	Rchb.f. 1877	•	•	•
<i>Maxillaria ramonensis</i>	Schltr. 1923			
<i>Maxillaria ramosa</i>	Ruiz & Pav. 1798			
<i>Maxillaria reichembachiana</i>	Endres & Rchb.f. 1871	•	•	
<i>Maxillaria ringens</i>	Rchb.f. 1863	•	•	•
<i>Maxillaria rufescens</i>	Lindl. 1836	•		
<i>Maxillaria sanguinea</i>	Rolfe 1895	•	•	
<i>Maxillaria schlechteriana</i>	J.T. Atwood 1994	•	•	•
<i>Maxillaria sigmoidea</i>	(C. Schweinf.) Ames & Corell. 1943	•		
<i>Maxillaria tenuifolia</i>	Lindl. 1837	•	•	•
<i>Maxillaria tigrina</i>	C. Schweinf. 1968	•		
<i>Maxillaria uncata</i>	Lindl. 1837	•	•	
<i>Maxillaria variabilis</i>	Batem. ex. Lindl. 1837	•	•	•
<i>Mendocella grandiflora</i>		•	•	
<i>Mesadenella tonduzii</i>	(Schltr.) Pabst & Garay 1952			
<i>Mesospinidium warszewiczii</i>	Rchb.f. 1862	•	•	
<i>Microchilus querticola</i>	(Lindl.) D. Dietr. 1852	•	•	
<i>Microchilus vescifer</i>	(Rchb.f.) Ormerod 2002			
<i>Monophyllorchis microstyloides</i>	(Rchb.f.) Garay 1962	•	•	•
<i>Mormodes doderoi</i>	Salazar 2008	•		
<i>Mormodes horichii</i>	Fowlie 1964	•	•	•
<i>Mormodes horichii ssp. helleri</i>	Salazar 2008	•		
<i>Mormodes skinneri</i>	Rchb.f. 1869	•		
<i>Mormodes sotoana</i>	Salazar 1992	•		
<i>Mormolyca ringens</i>	(Lindl.) Schltr. 1914	•	•	
<i>Myoxanthus hirsuticaulis</i>	(Ames & Schweinf.) Luer 1982	•		
<i>Myoxanthus octomeriae</i>	(Schltr.) Luer 1982	•	•	
<i>Myoxanthus octomerioides</i>	(Lindl.) Luer 1982			
<i>Myoxanthus scandens</i>	(Ames) Luer 1982	•	•	
<i>Myoxanthus speciosus</i>	(Luer) Luer 1982			
<i>Myoxanthus trachychlamys</i>	(Schltr.) Luer 1982			
<i>Myrmecolaelia fuchsia</i>	Hamer 1985			

Scientific Name	Author	Flower	Pod	Habitat
<i>Myrmecophila brysiana</i>	(Lem.) G.C. Kenn. 1985	•	•	•
<i>Myrmecophila christinae</i>	Carnevali & Gomez- Juarez 2001	•		
<i>Myrmecophila tibiscinis</i>	(Batem.) Rolfe 1917	•	•	•
<i>Myrmecophila wendlandi</i>	(Rchb.f.) G.C.enn 1979	•	•	
<i>Nidema boothi</i>	(Lindl.) Schltr. 1922	•	•	•
<i>Nidema ottonis</i>	(Rchb.f.) Brito. & Millsp.1920	•		
<i>Notylia pentachne</i>	Rchb.f. 1854	•		
<i>Notylia trisepala</i>	Lindl. 1852	•	•	•
<i>Octomeria costarricensis</i>	Schlechter 1923	•	•	
<i>Octomeria graminifolia</i>	(L.) R. Br. 1813	•		
<i>Oeceoclades maculata</i>	(Lindl.) Lindl. 1833	•	•	•
<i>Oestlundia luteorosea</i>	(A. Rich. & Gal.) W.E. Higgins 2001	•	•	•
<i>Oncidium bracteatum</i>	Warcz. & Rchb.f. 1852	•	•	•
<i>Oncidium cheiophorum</i>	Rchb.f. 1852	•	•	•
<i>Oncidium cheiophorum v. excauriculatum</i>	Hamer & Garay 1974			
<i>Oncidium ensatum</i>	Lindl. 1842	•	•	
<i>Oncidium guttulatum</i>	Rchb.f. ex. Lindl. 1855			
<i>Oncidium incurvum</i>	Barker ex. Lindl. 1840			
<i>Oncidium leucochilum</i>	Bateman ex. Lindl. 1837			
<i>Oncidium maculatum</i>	(Lindl.) Lindl. 1841			
<i>Oncidium oliganthum</i>	(Rchb.f.) L.O. Williams ex. Correll 1947	•	•	•
<i>Oncidium ornithorhynchum</i>	Kunth 1815	•		
<i>Oncidium planilabre</i>	Lindl. 1851			
<i>Oncidium sphacellatum</i>	Lindl. 1841	•	•	•
<i>Oncidium splendidum</i>	A. Rich ex. Duch. 1862	•	•	•
<i>Oncidium stenoglossum</i>	(Schltr.) Dressler & N.H. Williams 1975			
<i>Oncidium stenotis</i>	Rchb.f. 1877	•	•	•
<i>Oncidium subcruciforme</i>	(Heller) Garay & Stacy 1974			
<i>Ornithocephalus bicornis</i>	Lindl. 1843	•	•	
<i>Ornithocephalus gladiatus</i>	Hook 1824	•	•	•
<i>Ornithocephalus inflexus</i>	Lindl. 1840	•	•	•
<i>Ornithocephalus lankesteri</i>	Ames 1923			
<i>Ornithocephalus numenius</i>	Toscano & Dressler 2000			
<i>Palmorchis silvicola</i>	L.O. Williams 1970	•	•	
<i>Palmorchis trilobata</i>	L.O. Williams 1941			
<i>Pelexia congesta</i>	Ames & Schweinf. 1930			
<i>Pelexia funckiana</i>	(A. Rich & Gal.) Schltr. 1918			
<i>Pelexia laxa</i>	(Poepp & Endl.) Lindl. 1840			
<i>Pelexia olivacea</i>	Rolfe 1891			
<i>Pelexia smithi</i>	(Rchb.f.) Garay 1982			
<i>Phragmepedium existaminodium warscewiczianum</i>	Dressler 2005	•		

Scientific Name	Author	Flower	Pod	Habitat
<i>Physosiphon deregularis</i>	(Barb. Rodr.) Luer 1978	•		
<i>Physosiphon tubulatus</i>		•	•	
<i>Platystele compacta</i>	(Ames) Ames 1922	•	•	
<i>Platystele lancilabris</i>	(Rchb.f.) Schltr. 1923			
<i>Platystele oxyglossa</i>	(Ames & Schweinf.) Garay 1974			
<i>Platystele stenostackya</i>	(Rchb.f.) Schweinf. 1962	•	•	•
<i>Plakythelys vaginata</i>	(Hook.) Garay 1977			
<i>Plakythelys venustula</i>	(Ames) Garay 1977	•	•	
<i>Pleurothallis abbreviata</i>	Shltr. 1912			
<i>Pleurothallis abbreviata var. alleni</i>	L.O.Williams 1940			
<i>Pleurothallis angustifolia</i>	Lindl. 1835			
<i>Pleurothallis barbae</i>	Schltr. 1923			
<i>Pleurothallis barbulata</i>	Lindl. 1859	•		
<i>Pleurothallis cardiothallis</i>	Rchb.f. 1857	•	•	•
<i>Pleurothallis chontalensis</i>	A.H. Heller & A.D. Hawkes 1966	•		
<i>Pleurothallis corniculata</i>	(Sw.) Lindl. 1842			
<i>Pleurothallis dolichopus</i>	Schltr. 1922	•	•	
<i>Pleurothallis fuegii</i>	Rchb.f. 1866			
<i>Pleurothallis helleri</i>	Hawkes 1966			
<i>Pleurothallis homalanthia</i>	Schltr. 1923			
<i>Pleurothallis lewisae</i>	Ames 1931	•	•	
<i>Pleurothallis luctuosa</i>	Rchb.f. 1876			
<i>Pleurothallis matudiana</i>	C. Schweinf. 1938	•	•	•
<i>Pleurothallis nemorum</i>	Schltr. 1923	•	•	•
<i>Pleurothallis obovata</i>	Lindl. 1842			
<i>Pleurothallis pansamalae</i>	Schltr. 1912			
<i>Pleurothallis phyllocardioides</i>	Schltr. 1923	•	•	•
<i>Pleurothallis platystylis</i>	Schltr. 1922	•	•	
<i>Pleurothallis pruinosa</i>	Lindl. 1842	•	•	
<i>Pleurothallis racemiflora</i>	(Sw.) Lindl. 1824	•	•	
<i>Pleurothallis sclerophylla</i>	Lindl. 1835			
<i>Pleurothallis segregatifolia</i>	Ames & C. Schweinf. 1925	•		
<i>Pleurothallis seratularoides</i>	(Sw.) Spreng. 1826	•	•	
<i>Pleurothallis simmleriana</i>	Rendle 1900	•	•	
<i>Pleurothallis testaeifolia</i>	(Sw.) Lindl. 1858	•	•	
<i>Pleurothallis tubata</i>	(G. Lodd.) Steud. 1841			
<i>Pleurothallopsis reichembachianus</i>	(Endres ex. Rchb.f.) Pridgeon & M.W. Chase 2001			
<i>Pleurothallopsis ujarensis</i>	(Rchb.f.) Pridgeon & M.W. Chase 2001	•	•	
<i>Polystackya clavata</i>	Lindl. 1842	•	•	
<i>Polystackya concreta</i>	(Jacq.) Garay & H.R. Sweet 1974	•	•	
<i>Polystackya foliosa</i>	(Hook.) Rchb.f. 1863	•	•	•
<i>Polystackya lineata</i>	Rchb.f. 1869	•	•	

Scientific Name	Author	Flower	Pod	Habitat
<i>Polystackya masayensis</i>	Rchb.f. 1855	•	•	•
<i>Ponera graminifolia</i>	Lindl. 1839			
<i>Ponera striata</i>	Lindl. 1842	•	•	•
<i>Ponera subquadrilabia</i>	Corell. 1941	•	•	
<i>Ponthieva brenesii</i>	Schltr. 1923	•		
<i>Ponthieva ephippium</i>	Rchb.f. 1857			
<i>Ponthieva racemosa</i>	(Walt.) Mohr. 1909	•	•	
<i>Ponthieva tuerckheimii</i>	Schltr. 1923	•	•	
<i>Prescottia oligantha</i>	(Sw.) Lindl. 1840	•	•	
<i>Prescottia stackyodes</i>	(Sw.) Lindl. 1836	•	•	•
<i>Prosthechea abbreviata</i>	(Schltr.) W.E. Higgins 1997	•	•	•
<i>Prosthechea baculus</i>	(Rchb.f.) W.E. Higgins 1997	•	•	•
<i>Prosthechea brassavolae</i>	(Rchb.f.) W.E. Higgins 1997	•	•	•
<i>Prosthechea chacaoensis</i>	(Rchb.f.) W.E. Higgins 1997	•	•	•
<i>Prosthechea chondylobulbon</i>	(A. Rich & Gal.) W.E. Higgins 1997			
<i>Prosthechea cochleata</i>	(L.) W.E. Higgins 1997	•	•	•
<i>Prosthechea crassilabia</i>	(Poepp & Endl.) Carnevali & I. Ramirez 2003			
<i>Prosthechea fragrans</i>	(Sw.) W.E. Higgins 1997	•	•	•
<i>Prosthechea livida</i>	(Lindl.) W.E. Higgins 1997			
<i>Prosthechea ochracea</i>	(Lindl.) W.E. Higgins 1997	•	•	•
<i>Prosthechea pygmaea</i>	(Hook.) W.E. Higgins 1997	•	•	•
<i>Prosthechea radiata</i>	(Lindl.) W.E. Higgins 1997	•	•	•
<i>Prosthechea rhynchophora</i>	(A. Rich. & Gal.) W.E. Higgins 1997			
<i>Prosthechea valenzuelana</i>	(Schltr.) W.E. Higgins 1997	•	•	•
<i>Prosthechea varicosa</i>	(Batem.) W.E. Higgins 1997			
<i>Psilochilus macrophyllus</i>	Lindl. 1922	•	•	•
<i>Psilochilus modestus</i>	Barb. Rodr. 1882	•	•	
<i>Psychopsis krameriana</i>	(Rchb.f.) H.G. James 1975	•	•	
<i>Pteroglossa roseoalba</i>	Rchb.f. Salazar & Chase 2002			
<i>Restrepia muscifera</i>	(Lindl.) Rchb.f. ex. Lindl. 1859	•	•	
<i>Restrepia ophiocephala</i>	(Lindl.) Garay & Dunsterv. 1966	•	•	
<i>Rhyncholaelia digbyana</i>	(Lindl.) Schltr. 1918	•	•	
<i>Rhyncholaelia glauca</i>	(Lindl.) Schltr. 1918	•		
<i>Rhynchosele beloglossa</i>	(Rchb.f.) Dressler & N.H. Williams 2002	•	•	
<i>Rhynchosele cordata</i>	(Lindl.) Soto, Arenas & Salazar 1993			
<i>Rhynchosele rossii</i>	(Lindl.) Soto, Arenas & Salazar 1993			
<i>Rodriguezia compacta</i>	Schltr. 1923	•	•	
<i>Sarcoglottis acaulis</i>	(Sm.) Schltr. 1923	•	•	
<i>Sarcoglottis hunteriana</i>	Schltr. 1919	•		
<i>Sarcoglottis rossulata</i>	(Lindl.) P.N. Don 1845	•	•	
<i>Sarcoglottis sceptroides</i>	(Rchb.f.) Schltr. 1920	•	•	
<i>Sarcoglottis schaffneri</i>	(Rchb.f.) Ames 1905	•	•	

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<i>Sarcoglottis smithii</i>	(Rchb.f.) Schltr. 1922			
<i>Scaphiglottis amparoana</i>	(Schltr.) Dressler 1964	•		
<i>Scaphiglottis behrii</i>	(Rchb.f.) Beneth., J.D. Hook ex. Helms. 1883	•	•	
<i>Scaphiglottis bidentata</i>	(Lindl.) Dressler 2002	•	•	
<i>Scaphiglottis bilineata</i>	(Rchb.f.) Schltr. 1918	•		
<i>Scaphiglottis boliviensis</i>	(Rolfe) B.R. Adams 1988	•	•	
<i>Scaphiglottis confusa</i>	(Schltr.) Ames & Corell 1942	•	•	
<i>Scaphiglottis crurigera</i>	(Batem.) Ames & Corell 1942	•	•	
<i>Scaphiglottis fasciculata</i>	Hook 1840	•	•	•
<i>Scaphiglottis graminifolia</i>	(Ruiz & Pav.) Poepp. & Endl. 1836	•		
<i>Scaphiglottis imbricata</i>	(Lindl.) Dressler 2002	•	•	•
<i>Scaphiglottis laevilabia</i>	Ames 1921	•	•	
<i>Scaphiglottis lindeniana</i>	(A. Rich & Gal.) L.O. Williams 1941	•	•	
<i>Scaphiglottis livida</i>	(Lindl.) Schltr. 1918	•	•	
<i>Scaphiglottis longicaulis</i>	S. Wats. 1888	•	•	
<i>Scaphiglottis micrantha</i>	(Lindl.) Ames & Corell 1942	•	•	•
<i>Scaphiglottis minutiflora</i>	Ames & Corell 1942	•	•	
<i>Scaphiglottis prolifera</i>	Cogn. 1898	•	•	
<i>Scaphiglottis subulata</i>	Schltr. 1910	•	•	
<i>Scaphiglottis tenella</i>	L.O. Williams 1941	•		
<i>Scaphosepalus microdactylum</i>	Rolfe 1893	•		
<i>Schelochilus tuerckheimii</i>	Schltr. 1911			
<i>Schiedeela Amesiana</i>	Garay 1982			
<i>Schiedeela llaveana</i>	(Lindl.) Schltr. 1920			
<i>Schiedeela parasitica</i>	(A. Rich & Gal.) Schltr. 1920			
<i>Schiedeela trilineata</i>	(Lindl.) Burns Bal. 1981			
<i>Schiedeela wercklei</i>	(Schltr.) Garay 1982			
<i>Sievingia suavis</i>	Rchb.f. 1871	•		
<i>Sigmatostalix guatemalensis</i>	Schltr. 1911	•	•	•
<i>Sobralia atropubescens</i>	Ames & Schweinf. 1930	•		
<i>Sobralia bletiae</i>	Rchb.f. 1852	•	•	
<i>Sobralia bouchei</i>	Ames & Schweinf. 1930	•	•	
<i>Sobralia bradeorum</i>	Schltr. 1923	•	•	•
<i>Sobralia chatoensis</i>	A.H. Heller & A.D. Hawes 1966			
<i>Sobralia chrystosoma</i>	Batem. 1841	•	•	•
<i>Sobralia decora</i>	Batem. 1841	•	•	•
<i>Sobralia fragrans</i>	Lindl. 1853	•	•	•
<i>Sobralia helleri</i>	Hawkes 1966	•		
<i>Sobralia leucoxantha</i>	Rchb.f. 1866			
<i>Sobralia luteola</i>	Rolfe 1898	•	•	•
<i>Sobralia macrantha</i>	Lindl. 1839	•	•	•
<i>Sobralia mucronata</i>	Ames & Schweinf. 1925	•	•	

Scientific Name	Author	Flower	Pod	Habitat
<i>Sobralia warscewiczii</i>	Rchb.f. 1852	•		
<i>Sobralia wilsoniana</i>	Rolfe 1890			
<i>Specklinia alexii</i>	(Heller) Pridgeon & M.W.Chase 2001	•	•	
<i>Specklinia brighami</i>	(S.Watson) Pridgeon & M.W.Chase 2001	•	•	
<i>Specklinia echinata</i>	(L.O.Williams) Soto Arenas & Solano 2002			
<i>Specklinia exesilabia</i>	(A.H. Heller & A.D.Hawkes) S.A. Solano 2002			
<i>Specklinia fulgens</i>	(Rchb.f.) Pridgeon & M.W. Chase 2001			
<i>Specklinia geminiflora</i>	(Ames, Hubb. & Schweinf.) Pridgeon & Chase 2001	•		
<i>Specklinia glandulosa</i>	(Ames) Pridgeon & M.W.Chase 2001	•	•	
<i>Specklinia grobyi</i>	(Batemm.ex. Lindl.) Pridgeon & M.W. Chase 2001	•		
<i>Specklinia guanacastensis</i>	(Ames & Schweinf.) Pridgeon & MW Chase 2001	•	•	•
<i>Specklinia hastata</i>	(Ames) Pridgeon & M.W. Chase 2001	•	•	
<i>Specklinia microphylla</i>	(A.Rich. & Gal.) Pridgeon & M.W. Chase 2001			
<i>Specklinia periodica</i>	(Ames) Pridgeon & M.W.Chase 2001			
<i>Specklinia tribuloides</i>	(Sw.) Pridgeon & M.W.Chase 2001	•	•	
<i>Specklinia yucataensis</i>	(Ames & Schweinf.) Pridgeon & M.W. Chase 2001			
<i>Spiranthes torta</i>	(Thunb.) Garay & H.R. Sweet 1974			
<i>Stanhopea cirrhata</i>	Lindl. 1850	•		
<i>Stanhopea confusa</i>	Gerlach & Beeche 2004	•		
<i>Stanhopea costarricensis</i>	Rchb.f. 1860	•	•	•
<i>Stanhopea ecornuta</i>	Lem. 1846	•	•	
<i>Stanhopea gibbosa</i>	Rchb.f. 1869	•	•	•
<i>Stanhopea graveolens</i>	Lindl. 1840	•	•	
<i>Stanhopea oculata</i>	(G. Lodd.) Lindl. 1832	•	•	
<i>Stanhopea wardii</i>	Lindl. 1838	•		
<i>Stelis aemula</i>	Schltr. 1918			
<i>Stelis aprica</i>	Lindl. 1836	•		
<i>Stelis argentata</i>	Lindl. 1842	•	•	
<i>Stelis bracteata</i>	Lindl. 1850			
<i>Stelis carnosilabia</i>	(Heller & Hawkes) Pridgeon & M.W.Chase 2001	•	•	
<i>Stelis catharinensis</i>	Lindl. 1836			
<i>Stelis chihobensis</i>	Ames 1922	•		
<i>Stelis ciliaris</i>	Lindl. 1836			
<i>Stelis cleistogama</i>	Schltr. 1918			
<i>Stelis cobanensis</i>	(Schltr.) Pridgeon & M.W. Chase 2001			
<i>Stelis conmixta</i>	Schltr. 1918			
<i>Stelis convallaria</i>	(Schltr.) Pridgeon & M.W. Chase 2001	•		
<i>Stelis crescenticola</i>	(Schltr. 1920)			
<i>Stelis cucullata</i>	Ames 1923			
<i>Stelis deregularis</i>	Barb. Rodr. 1882			
<i>Stelis despectans</i>	Schltr. 1910			
<i>Stelis gelida</i>	(Lindl.) Pridgeon & M.W.Chase 2001	•	•	•

Scientific Name	Author	Flower	Pod	Habitat
<i>Stelis gigantea</i>	Pridgeon & M.W.Chase 2001			
<i>Stelis glossula</i>	Rchb.f. 1870			
<i>Stelis gracilis</i>	Ames 1908	•	•	
<i>Stelis guatemalensis</i>	Schltr. 1899	•	•	•
<i>Stelis hymenantha</i>	Schltr. 1912			
<i>Stelis immersa</i>	(Linden.& Rchb.f.) Pridgeon & M.W.Chase 2001	•	•	•
<i>Stelis inaequalis</i>	Ames 1923			
<i>Stelis longipetiolata</i>	Ames 1922			
<i>Stelis megachlamys</i>	(Schltr.) Pupulin 2002	•	•	•
<i>Stelis ovatilabia</i>	Schltr. 1918			
<i>Stelis pachyglossa</i>	(Lindl.) Pridgeon & M.W.Chase 2001			
<i>Stelis parvula</i>	Lindl. 1858	•	•	
<i>Stelis powellii</i>	Schltr. 1922	•	•	
<i>Stelis propinqua</i>	Ames 1923			
<i>Stelis purporascens</i>	A.Rich. & Gal. 1845	•	•	
<i>Stelis quadrifida</i>	(Llave + Lex.) Lind. 1842	•	•	
<i>Stelis rubens</i>	Schltr. 1910			
<i>Stelis segoviensis</i>	(Rchb.f.) Pridgeon & M.W.Chase 2001	•	•	•
<i>Stelis superbis</i>	Lindl. 1858			
<i>Stelis wercklei</i>	Schltr. 1923			
<i>Stelis williamsii</i>	Ames. 1922			
<i>Stenorrhynchos aurantiacum</i>	(LaLlave & Lex.) Lindl. 1840	•	•	•
<i>Stenorrhynchos lanceolata</i>	(Aubl.) Rich. 1826	•	•	•
<i>Stenorrhynchos speciosum</i>	(Jacq.) Spreng. 1826	•	•	
<i>Stenotyla lendyana</i>	(Rchb.f.) Dressler 2005	•		
<i>Stenotyla helleri</i>	(Fowlie) Pupulin 2007			
<i>Telipogon helleri</i>	(L.O.Williams) N.H. Williams & Dressler 2007			
<i>Teuscheria pickeriana</i>	(Schltr.) Garay 1959			
<i>Ticoglossum krameri</i>	(Rchb.f.) Halb. 1983	•		
<i>Ticoglossum krameri smithianum</i>	(Rchb.f.) Christensen 1991	•	•	
<i>Trevoria glumacea</i>	Garay 1970	•	•	
<i>Trevoria zahlbruckneriana</i>	(Schltr.) Garay 1970	•	•	•
<i>Trichopilia marginata</i>	Henft 1851	•		
<i>Trichopilia galeottiana</i>	Rich. 1845	•		
<i>Trichopilia subulata</i>	(Sw.) Rchb.f. 1865			
<i>Trichopilia tortilis</i>	Lindl. 1836	•	•	•
<i>Trichopilia turrialvae</i>	Rchb.f. 1853	•	•	
<i>Trichosalpinx blaisdellii</i>	(S.Watts) Luer 1983	•	•	•
<i>Trichosalpinx cedraensis</i>	(Ames) Luer 1983	•		
<i>Trichosalpinx ciliaris</i>	(Lindl.) Luer 1983	•		
<i>Trichosalpinx dura</i>	(Lindl.) Luer 1983			
<i>Trichosalpinx memor</i>	(Rchb.f.) Luer 1983	•	•	

Scientific Name	Author	Flower	Pod	Habitat
<i>Trichosalpinx orbicularis</i>	(Lindl.) Luer 1983	•		
<i>Trigonidium egertonianum</i>	Batem. 1838	•	•	•
<i>Trigonidium seemanni</i>	Rchb.f. 1854	•	•	•
<i>Triphora debilis</i>	Schltr. 1921			
<i>Triphora trianthophora</i>	(Sw.) Rydb. 1993	•		
<i>Tropidia polystachya</i>	(Sw.) Ames 1922	•	•	
<i>Vanilla hartii</i>	Rolfe 1899			
<i>Vanilla helleri</i>	Hawkes 1966	•		
<i>Vanilla inodora</i>	Schiede 1829	•	•	
<i>Vanilla odorata</i>	Presl. 1827	•	•	•
<i>Vanilla planifolia</i>	G. Jackson 1868	•	•	
<i>Vanilla pompona</i>	Schiede 1829	•	•	•
<i>Warrea costarricensis</i>	Schltr. 1920	•	•	
<i>Wulfschaegella aphylla</i>	(Sw.) Rchb.f. 1863			
<i>Xylobium elongatum</i>	(Lindl. & Paxton) Hemsl. 1885	•	•	•
<i>Xylobium foveatum</i>	(Lindl.) G. Nicholson 1887	•	•	•
<i>Xylobium pallidiflorum</i>	(Hook.) G. Nicholson 1887	•		
<i>Xylobium powellii</i>	Schltr. 1922			
<i>Xylobium sulfurinum</i>	(Lindl.) Lindl. 1918	•		
<i>Zhukowskia cerina</i>	(Lindl.) Szlach, R. Gonzalez & Rurk. 2000			
<i>Zhukowskia richardiana</i>	(Schltr.) Szlach, R. Gonzalez & Rurk. 2000			
<i>Zhukowskia smithii</i>	(Rchb.f.) Szlach, R. Gonzalez & Rurk. 2000			
<i>Zootrophion endresianum</i>	(Kraenzl.) Luer 1982	•	•	•
<i>Zootrophion hypodiscus</i>	(Rchb.f.) Luer 1982			
<i>Zootrophion gracilentum</i>	(Rchb.f.) Luer 1982	•		
<i>Zootrophion moorei</i>	(Rolfe) Luer 1982			

THE ORCHIDS

Acianthera circumplexa

(Lindley) Pridgeon & M.W. Chase 2001

■ **Description:** Up to 25 cm. tall. Secondary stems are triangular, sulcate, unifoliate, up to 14 cm. Leaves to 10 cm., retuse, with an apicule on the sinus, conspicuously carinate dorsally. Peduncle is joined with the leaf and hidden within it, 4 cm., conduplicate spathe, 1.2 cm., with approximately 10 olive green to yellowish flowers. Floral bract is 4 mm. Sepals are trinerved, concave; dorsal sepal is 6 mm; lateral sepals united forming a sub-orbicular lamina, 3.5 mm. Petals are oblique, acute, irregularly serrate on top, 3 mm. Lip is fleshy, with obtuse and serrate apex, 3 mm, with a linear callus on each side of the disc from the lateral lobes to the intermediate lobe. Column is 3.5 mm, with a conspicuous foot.

Habitat: Epiphyte in cloud forest.

Flowering season: December.

Observations: We have found this species only once in Boaco near Santa Lucia on exposed mountaintops where was locally common.

Acianthera cogniauxiana

(Schlechter) Pridgeon & M.W. Chase 2001

■ **Description:** 20 cm. tall, thickened rhizome. Secondary stems are rigid. Leaves are coriaceous, 12 cm., with an acuminate and acute apex. Racemose Inflorescence with 2 to 14 dictic flowers, from a 1 cm. spathe, raceme is 5 cm., including the short peduncle. Flowers are greenish, with big red patches on the lateral sepals and few on the dorsal sepal. Lip is yellow-greenish, with a red nail. Floral bract is small. Dorsal sepal is 1.2 cm., with 3 green nerves; lateral sepals are completely connate, with retuse apex, 9 mm., wavy edges and a verrucose chin; the interior of the sepals with verrucose patches. Petals are translucent white with red patches and red nerves, 4 mm. Lip is fleshy, with obtuse apex, dentate edges with a pair of erect lobes, rounded in the basal half, with 2 auricles at the base; verrucose disc, with a pair of dentate calli in the center. Column is 3 mm. long, with curved wings and a conspicuous foot.

Habitat: Epiphyte in cloud forest.

Flowering season: October, November.

Observations: Rare in Nicaragua, we found it as solitary plants a couple of times in Matagalpa and Jinotega.

Acianthera hondurensis

(Ames) Pridgeon & M.W. Chase 2001

■ **Description:** Up to 30 cm. tall. Secondary stem is thick, to 15 cm., patent to pendant due to the leaf weight. Leaves

are fleshy, 12 cm., attenuate towards both sides, purple, with retuse apex, with a small apicule on the sinus. Racemose Inflorescence, shorter than the leaf, 7 cm., with up to 7 flowers; peduncle is thin, 3 cm. long. Flowers are inverted with lateral sepals pointing upwards, magenta due to the wide nerves with the same color over a green-yellowish base. Floral bract is 2 mm. Dorsal sepal is 9 mm., concave, with reflexed apex and three red nerves; lateral sepals are connate, each with three red nerves that form a conspicuous chin with the foot of the column. Petals are 3 mm., white, with a red conspicuous nerve. Lip with a tooth on each side of the nail over which grows a small lobe; the outside has 3 elevated and red nerves, the inside is cream except for the wide red-violet edge which is 3 mm; disc with fleshy and thickened edges. Column is 2 mm., with a foot that has the same length, winged at the apex.

Habitat: Epiphyte; grown on rainy plains.

Flowering season: November.

Observations: We have not seen this species; information from Hamer (2001).

Acianthera pantasmi

(Reichembach f.) Pridgeon & M.W. Chase 2001

■ **Description:** Secondary stem is arched, fleshy, terete at the base, laterally compressed from the base up to 15 cm. Leaf is fleshy, 8 cm., dorsally carinate and tridentate at the apex. The plant has 1 to 3 short Inflorescences with 2 to 4 fasciculate flowers; peduncle is 4 mm. long, hidden in a 5 mm. spathe. Flowers are fleshy and red-brown. Floral bract is inflated, acute, less than 2 mm. long. Dorsal sepal is emarginate, with 5 nerves, 5 mm., outside is pubescent, inside is rugose; lateral sepals are connate, retuse at the apex, 4.5 mm. Petals are thin, 2.7 mm. Lip is fleshy, arched, with thin curved lobes on the basal portion, 2.4 mm; disc with a elevated lateral callus from the base to over the middle. Column is 2.5 mm., with a 1 mm. Foot, lateral wings and a dentate apex.

Habitat: Epiphyte; grows in wet areas.

Flowering season: December to February.

Observations: We have seen this species only in Nueva Segovia at 900 m., near Dipilto, Epiphyte on branches.

Acianthera verecunda

(Schlechter) Pridgeon & M.W. Chase 2001

■ **Description:** with creeping rhizome, stem is black-purple, up to 10 cm. and covered with scarious to fibrous sheaths, the lower half terete and sulcate on the apical half. Leaves are 11 cm., with 3 acuminate and conspicuous teeth at the apex,

dorsally carinate. Racemose Inflorescence, short, 4.2 cm. long, including the 1 cm. petiole, with 5 to 8 imbricate and successive flowers. Flowers are green, with intense red-brown patches. Floral bract is 2 mm. Sepals are trinerved; dorsal sepal is 8.6 mm., apical half is reflexed, obtuse and fleshy; lateral sepals are connate up to the bifid apex, acute, 8 mm. Petals are translucent, 3 mm., with a fleshy base. Lip with two auricles on either side of the nail, obtuse apex; on each side of the base an erect triangular tooth; the entire lip is 4 mm., fleshy, purple with a white nail; disc is sulcate, white, thick, with a pair of elevated carinae from the lateral lobes. Column is 3 mm., arched, winged and dentate at the apex.

Habitat: Epiphytic in wet forest.

Flowering season: March to July.

Observations: We have not seen this species; information from Hamer (2001).

Ada chlorops

(Endres and Reichenbach) 1873

■ **Description:** This plant can grow up to 30 cm. high. It has a 60 cm. Inflorescence with up to 10 flowers. The flower of this plant has green sepals and petals in young flowers (yellowish in old flowers) with red stripes, yellow lip, and green column and antenna contained in the lip.

Habitat: Epiphytic in the understory cloud forest.

Flowering season: June to October.

Observations: Not common in Nicaragua; we have seen 3 isolated plants, not easy to recognize without the flower, previously known from one report (Hamer 2001). It was found on Mt. Goviado, and near a tourist center in Datanli-Diablo, and for sale at roadside in Matagalpa.

Arpopyllum alpinum

Lindl. Benth & Pl. Hartw 1842

■ **Description:** Plant is up to 60 cm. high, leaves are typically 30 cm. by 2cm; it flowering seasons in clusters measuring 2-6 cm. long; it has 15-30 purple to pale pink flowers per Inflorescence; The sepal has 3 nerves, apex is recurved with a nerve and the column possesses a very short foot. Rhizome is creeping.

Habitat: Epiphytic in the cloud forest canopy approximately 1300 or 1500 m. above sea level; very common in the Datanli-Diablo protected area.

Flowering season: January to March.

Observations: Similar to *A. spicatum* but smaller and the Inflorescence is shorter than in *A. spicatum*.

Arpopyllum giganteum

Hartwig ex. Lindley 1840

■ **Description:** 90 cm. high, it has a dense elongate columnar Inflorescence. Its rhizome is creeping and the stem can measure up to 22 cm. long. Leaves fleshy, up to 60 cm. long, 4 cm. wide. Small 3mm. purple to pink flowers. It possesses sepals

with five nerves and the lip has a more intense color. Rounded apex and an erect column with three teeth at the apex.

Habitat: Epiphytic plant on the main branches of big trees in the canopy of the wet forest, approximately 1200 or 1500 m. above sea level.

Flowering season: January to March

Observations: This species requires low temperatures and great moisture; it does not prosper out of its natural habitat. The flowers are similar to *A. spicatum*, but the plant is fifty percent bigger and the flowers are more numerous, typically more than a hundred, compared with less than sixty in *A. spicatum*.

Arpopyllum spicatum

Lex. 1825

■ **Description:** Creeping rhizome Plant is up to 50 cm. high, leaves are typically 30 cm. by 2cm; it flowering seasons in clusters measuring 2-6 cm. long; it has 30 to 50 purplish flowers per Inflorescence; The sepal has 3 nerves, apex is recurved with a nerve and the column possesses a very short foot.

Habitat: Epiphytic in the cloud forest canopy approximately 1300 or 1500 m. above sea level; common around Datanli-Diablo.

Flowering season: January to March.

Observations: Intermediate between *A. alpinum* and *A. giganteum* in same habitat.

Arundina graminifolia

(Dan) Hochr.

■ **Description:** Up to 3m high with 9 cm.-wide apical flowers, pink-purple lip similar to *Sobralia*; clear pink sepals. Unlike *Sobralia*, it has more abundant leaves, thin as grass, up to 30 cm. long by 1 wide, produces several flowers consecutively at every apex.

Habitat: Open fields, gardens, from sea level to 1400 m.

Flowering season: Year-round.

Observations: This species is native of South East Asia, commonly introduced in ornamental gardens; in some areas like Rio Blanco and Mombacho they have also established wild plants, which has lead to confusion and its appearance on the cover of Werner's book (2001). Due to our suitable climate and the fact that well developed plants flower almost constantly it is one of the best species for beginners.

Aspasia epidendroides

(Lindley) 1843

■ **Description:** Epiphytic with green pseudobulbs laterally compressed, possesses one or two Inflorescences simultaneously successive which can be up to 25 cm. long. From 4 to 8 successive aromatic flowers flowering season, the sepal is fleshy and green yellowish and purple-brown blotches in the edges and in some cases purple – dark brown, we have observed much variation in the flower color of the species.

Habitat: Grows in hot climate, generally in the coastal plain. It also grows in broad leaf forest. In addition reported on metamorphic rocks (Hamer 2001) but we have not confirmed this report.

Flowering season: October to March

Observations: We have found that this species requires relatively undisturbed forest and grows on trunks near the floor. It differs from *A. principissa* in the sepal coloration being spotted as opposed to longitudinally striped on *A. principissa*.

Aspasia principissa

Reichembach 1852

■ **Description:** This plant possesses laterally compressed pseudobulbs to 10cm, 40 cm. with leaves. Flowers green - yellow, petals and sepals with longitudinal brown stripes, without color variants. The lip is white, turning yellow as the flower ages. The column measures from 1 to 1.2 cm..

Habitat: Epiphyte near the base of trees in

Flowering season: March, September and October.

Observations: Hamer (1984) has a single distributional point in the Pacific Ocean by the Cosiguina Volcano, while in his text (Hamer 2001), states that there is only one report from the San Juan River. We have found this species at several points in forest along the San Juan River and consider the Cosiguina Volcano point to be erroneous.

Barbosella dolichorhiza

Schlechter 1920

■ **Description:** Plant to 7 cm. high, with creeping rhizome; secondary stems are 5 cm. long unifoliate. Inflorescence with 7 cm.-long peduncle, generally has a solitary flower. Flower patent, yellow with one brown-reddish stripe on the center of the lip. Sepals with verrucose edges. Leaves are 20-30 mm. long canaliculate.

Habitat: Epiphyte, 1500 m. above sea level.

Flowering season: October and November.

Observations: We have not seen this species so we based our description on Hamer (2001).

Barbosella orbicularis

Luer 1976

Descripción: Small 6 cm., creeping; leaves rounded green, 6 cm diameter flowers solitary on a thin which rises above the leaves that lie flat against the trunk, sepals and petals thickened at the apices.

Hábitat: Epiphytic plant in Atlantic rain forest flowering season unknown.

Floración: Se desconoce.

Observations: We have not seen this species in Nicaragua. Its small size and creeping nature render it very inconspicuous when not in flower, probably difficult to cultivate. The round leaves distinguish it from its Nicaraguan congeners.

Barbosella orbicularis

Luer 1976

■ **Description:** Small 6 cm., creeping alternate round green leaves about 6 mm. diameter. Flower solitary on end of thin green stem, rising well above the flat leaves, with petals and sepals thickened apically.

Habitat: Epiphyte in cloud forest.

Flowering season: Not known.

Observations: We have not seen this species in Nicaragua. Small size and creeping nature most likely a canopy Epiphyte makes it very inconspicuous when not in flower, moreover likely difficult to cultivate in warmer areas of Nicaragua. Round leaves distinct.

Barbosella prorepens

(Reichembach) 1877

■ **Description:** Plant measures up to 5 cm. long, leaves caniculate. filiform Inflorescence, solitary flower, peduncle 6 mm. long. The flowers are cleistogamous (they open little), have a pale yellow color with a pink stripe in the center of the lip. Sepals are long and acuminate; fleshy apex and 3mm. column.

Habitat: Epiphyte that grows at the base of mountains or cloud forests

Flowering season: December

Observations: Inconspicuous and uncommon; we have seen it only once in Boaco on a trunk in the forest edge.

Barbosella reichenbachiana

(Endres & Reichembach) 1875

■ **Description:** Plant with a single flower on a peduncle that measures 5.5 cm. in length. The flowers are patent, yellow, with a red nerve. The inside is purple and the underside of the lip possesses a red nerve. The sepal measures 1 cm. in length, the dorsal sepal has three red nerves; the lateral sepal possesses two carinate nerves and a conspicuous nerve. This plant possesses a short rhizome.

Habitat: Epiphyte in well preserved wet broadleaf forest in the montane zones.

Flowering season: Throughout the year.

Observations: We found this species only once.

Barkeria obovata

(Presl.) Christenson 1988

■ **Description:** Up to 60cm, flowering leafless, articulated leaves with green sheaths. Terminal inflorescence, clusters of 4 to 50 flowers; a 12-15 cm. long peduncle, which is brown in the area where it is not covered with sheaths. The majority of the flowers are cleistogamous, they are white, the lip has purple nerves, the column is green-yellowish with purple anthers. Long, white carinate sepals in the lower side. White petals and lip shortly acuminate.

Habitat: Epiphyte, grows on mountains, low, deciduous vegetation, trees and bushes, and citric trees.

Flowering season: December to March.

Observations: Common on farms with citrus trees in Carazo but few flowers open properly. Synonym: *B. chinensis*

Barkeria spectabilis

Bateman ex Lindley. 1842

■ **Description:** Up to 60cm; leaves green to purple. Roots very thick. Terminal Inflorescence, with a raceme of two to ten pendulous flowers. Its flowers are large and very bright white, pale-purple or dark purple. Petals violet. Lip violet, with irregular, dark purple spots. Column is 1.5 cm. long, green inside, outside with purple spots. The sepals have the same color as the petals.

Habitat: Epiphyte, it is found in dry climate places.

Flowering season: March and May.

Observations: Thicker roots than *B. obovata* and the flower is easy to recognize by its size, color and acuminate lip. Reported once on the road to Leon, but we have not seen it in Nicaragua.

Baskervilla colombiana

Garay 1953

■ **Description:** Plant with a dense 12-15 cm cluster of flowers. Flowers, white. Roots are extended, with up to 50 cm. of long. Turgid 8 cm. leaves, lip is 8mm. long and 4mm. wide, attached to the base of the column.

Habitat: Terrestrial plant; grows in cool wet climate at 1100 or 1200 m. above sea level.

Flowering season: November.

Observations: We have not found this species; information taken from Hamer (2001).

Beloglottis costaricensis

(Reichembach) 1855

■ **Description:** This plant can measure up to 25 cm. Olive green leaves, with wavy edges and 19 cm. long. Inflorescence to 15 cm. high. It has small white flowers with green central nerves. The base of the petals and sepals are green. Lip has a short and wide nail. Apex recurved.

Habitat: Terrestrial in mountains to 1000 m.

Flowering season: February and March.

Observations: We found this species only once in Boaco at 900 m. near Santa Lucia.

Beloglottis hameri

Garay & Hamer 1981

■ **Description:** Plant with thick, fleshy roots. Inflorescence occurs in a cluster. White flowers with green petals and a green

central nerve. The floral bracts are acute, 7 mm. long. This plant can measure up to 20 cm. high. Column, short, 2.5 mm. long.

Habitat: Terrestrial, Atlantic slope, 80 to 1300 m.

Flowering season: March.

Observations: We have not seen this unusual species; according to Hamer it is conspicuous; information taken from Garay & Hamer (1981), Hamer (2001).

Beloglottis mexicana

Garay & Hamer 1981

■ **Description:** Plant that measures 15 cm. high with acute 3 cm. leaves. The Inflorescence has 10 to 15 flowers. The roots are thick and fleshy. The flowers are small greenish-white. The column is very short.

Habitat: Terrestrial plant that grows in montane cloud forest, and according to Hamer (2001), also in pine forest.

Flowering season: March, and according to Hamer (2001) in September.

Observations: We have found some samples that correspond to the description of Hamer and Garay (1981) in the humid base of the Mt. Maderas, only one collection is reported from Mombacho Volcano.

Benzingia reichembachiana

(Schlechter) Dressler 2005

■ **Description:** Reduced pseudobulbs. Articulated leaves with their sheaths, 20 cm. long. Lateral, solitary Inflorescence. Flowers are pale yellow or yellow. Dorsal sepal is 18 mm. long and laterals are 20 mm long, obliquely united. Obtuse petals, with reflexed apex, the apical edges are slightly wavy, 20 mm long. Tubular lip with lateral edges that surround the column. Column is bent and truncated at the apex.

Habitat: Epiphyte in cloud forest 1000-1200 m.

Flowering season: June to August.

Observations: Species is rare, plant without flowers it is not easy to recognize. We found it once near the top of Cerro Apante and in a collection by Cerro Diablo.

Bletia purpurata

Rich & Gal 1845

■ **Description:** Generally this plant has two leaves and one small leaf in form of sheath in the basal portion, has longitudinal nerves and of variable. This plant can measure up to 70 cm. high. Inflorescence of approximately 70 cm. long, with purple peduncle covered with sheaths, with 3 to 6 flowers. Purple flowers, when the flowers are young in the outside they are green-yellowish, rarely opening. Sepal measures 32 mm. long, it is purple with a white base, the outside is warty, especially at the apex. The petals are 30 mm. long, purple. Lip has wavy edges, the center of the lip is purple and white, with purple edges. The column is 30 mm. long.

Habitat: Terrestrial plant, grows in cool climate with pine forests.

Flowering season: July and August

Observations: We have not seen nicaraguan specimens but have found it in Mexico.

Bletia purpurea

(Lam.) 1791

■ **Description:** 80 cm. high, with leaves that measure up to 80 cm. Short bulbs wider than high, up to 6 cm. Lateral Inflorescence, the flower grows before the leaves have developed, can have many successive flowers. Lateral multi flowered Inflorescence of the bulb up to 1m. of length. Pink-purple, flowers. The column is bent, has 15 mm. of long, with a short foot.

Habitat: Terrestrial plant grows in lava flows and in open fields on rocky hills and between rocks. It grows in open fields, mainly out of reach of cattle, locally common 100 to 1400 m. high.

Flowering season: February to May.

Observations: Size of the plant is variable according to soil conditions.

Bletia purpurea alba

Ariza & Jimenez 1960

■ **Description:** The flowers are white with a yellow disc on the lip, with greenish sepals. Dorsal sepal has seven carinate nerves, with a recurved apex. The petals have three nerves, and the central nerve carinate. Column 10 mm. long with a 3 mm. long foot.

Habitat: Terrestrial plant that grows in humid mountain meadows.

Flowering season: July

Observations: Although *B. purpurea* is the most common the Bletias in Nicaragua the white form is considerably less common although we once found a group of a dozen plants, all with white flowers.

Bletia roezlii

Reichembach 1877

■ **Description:** Relatively small plant (20cm) with leaves that are green on top and purple on the underside. Bulb elongate, 1.5 cm. The Inflorescence measures 20 to 30 cm. in length, it has up to 3 flowers, which are green-yellowish. Sepal red; the column is 10 mm. long with a yellowish white inside and a red outside.

Habitat: Terrestrial plant that grows occasionally on rocks, in dead vegetation and pine and oak forests.

Flowering season: May to August

Observations: Because it grows between vegetation, it is inconspicuous and difficult to detect. We found it once in the Dipilto mountain range at 1200 m.; in an open field associated with *Eulophia alta* and *B. purpurea*.

Brachiomidium folsomii

Dressler 1982

■ **Description:** Plant with creeping rhizome. Stems short, up to 25 mm, and covered with imbricate and unifoliate sheaths. The leaves are elliptical, peduncle to 30 mm. long, growing near the stem apex, with a solitary flower. The flowers are big, with greenish sepals and petals, purple lip. The petals have fine ciliated edges, with a 7 mm. long extension. Lip measures 3.5 mm, with the sides bent, acute apex up to apicule, with a fleshy centered callus at the base. The column is short.

Habitat: Epiphyte amid moss in Cloud forest.

Flowering season: March and April.

Observations: We found a solitary plant in flower near the top of Mt. Musun in January.

Brachionidium valerioi

Ames & Schweinfurth 1930

■ **Description:** Plant with creeping rhizome. Stems short, up to 25 mm, and covered with imbricate and unifoliate sheaths. The leaves are elliptical, peduncle to 30 mm. long, growing near the stem apex, having a solitary flower. The flowers are big, with greenish sepals and petals, purple lip. The petals have fine ciliated edges, with a 7 mm. long extension. Lip measures 3.5 mm, with the sides bent, acute apex up to apicule, with a fleshy centered callus at the base. The column is short.

Habitat: Epiphyte grows on wet climate.

Flowering season: March and April

Observations: We have not seen this plant in the wild; information taken from Hamer (2001)

Brachystele guayanensis

(Linley) 1840

■ **Description:** Small plant with thick roots, leaves are absent during flowering. Short, cylindrical and multiple flower spike. The stem has tubular acuminate sheaths. Concave floral bract, 4 to 6 mm. long. The flowers are small, green, with white lip. Acute to acuminate sepals. The petals are rounded at the apex. Lip is bent-reflexed, in natural position it is 2.5 mm. long. Short, turgid column, 1 mm. long.

Habitat: Plant grows in open abandoned fields.

Flowering season: May and June

Observations: We have not seen this plant in the wild; information taken from Hamer (2001).

Brassavola cucullata

(L.) 1763

■ **Description:** Plant with secondary green stems, when the plant is young the stems are surrounded by rough sheaths, rarely bifoliate. Acute, fleshy, channeled leaves in the upper side, to 30 cm. long. The Inflorescence is usually solitary but can have

two to three flowers. The flowers are white-yellowish, big and bright, with white lip; at night has a very pleasant scent. Sepal is green-yellowish, soft and hanging, 9.5 cm. long, edges and underside with brown spots. Petals 9.5 cm. long and have the same color as sepals. Lip is 8 cm. long, lateral lobes are reflexed and imbricate, white with brown apex. Column is 16 mm. long and white. Leaf is finely acute, 30 cm. to 7 mm. wide.

Habitat: Epiphyte; grows in open dry forests, on trees and very dry and sunny rocks. To about 600 m. elevation.

Flowering season: May to August

Observations: The imbricate margin of the lip separate the flower from others in the genus; the seed capsule is also very striking, 30 cm. long, very acuminate.

Brassavola grandiflora

Lindley. 1839

■ **Description:** Leaves are 17 cm. long, fleshy and flattened. Inflorescence in cluster with 2 to 3 flowers. White flowers, with approximately 15 cm. diameter. Sepals are 9 cm. long and green-yellowish; petals are 8 cm. long and have the same color as the sepals. White lip, with a nail that embraces the column. The column is small, 7 mm. long and green.

Habitat: Epiphyte; grows in moist places and lowland forests.

Flowering season: Intermittent all year.

Observations: There is confusion between this species and *B. venosa*. We have observed a change in the shape of the leaves when moving the plant to a new location hence the shape and length of the leaf seems partially influenced by the environment. Specimens in Costa Rica have a very long stem with flowers. On the Corn Island we found specimens with spots in the neck interspersed with plants lacking the spots, but otherwise identical, the two may thus be synonymous.

Brassavola nodosa

(L.) 1753

■ **Description:** Plant with secondary stems 5 cm. long. Leaves 12 to 15 cm. long, green. Inflorescence terminal in cluster of 2 to 4 flowers. White flowers. Green-yellowish sepals, 5 to 6 cm. long; petals have the same color as sepals. White lip with brown spots in the inner basal portion. Column short, 6mm. long, surrounded in the nail of the lip.

Habitat: Epiphyte, from sea level to 1100 m. in dry forest.

Flowering season: Mainly from April to September, but if watered it blooms all year.

Observations: Popularly known for its nocturnal scent. It differs from *B. venosa* and *B. flora grandis* in purple spots in the neck of the flower which are absent in the other two species. Hamer (2001) considers that they may be synonymous, but in almost all the populations we have found, we see one or other phenotype of flower, except on Corn island we find both interspersed.

Brassavola venosa

(Lindley) 1840

■ **Description:** Plant with secondary stems 10 to 12 cm. long. Leaves 15 to 22 cm., fleshy, flat and canaliculate. Inflorescence in clusters, with 2 to 4 flowers. White-yellowish flowers with white lip. Column is small, 7 mm. long, green.

Habitat: Epiphyte; grows in rocks and uninhabited islands at sea level or in wet tropical forests.

Flowering season: Any season depending on water availability.

Observations: It may be synonymous of *B. flora grandis*; even though there are differences, the leaf characteristics are plastic according to the environment.

Brassia caudata

(L.) 1824

■ **Description:** Plant can measure up to 40 cm. Green 20 cm. leaves. Inflorescence up to 50 cm. long with up to 12 flowers. Green-yellowish flowers with brown spots. Sepals vary in length. Lip is 20 mm. long, yellow with few spots around the callus, disc with 2 papillous calli 5 mm. long. Short column 4 mm. long.

Habitat: Epiphyte; grows in broad-leaf evergreen forests.

Flowering season: April to June.

Observations: Variations exist in the number and intensity of the spots around the neck. We have observed this species in cultivation only.

Brassia gireoudiana

Reichenbach f. & Warsz. 1854

■ **Description:** Plant with 10 cm. laterally compressed green unifoliate pseudobulbs. Leaves green, 25 to 30 cm. long, conduplicate at the base. Lateral Inflorescence, cluster with 5 to 12 flowers. The flowers are 18 cm. long, green-yellowish and purple spots. Dorsal sepal is 7.5 cm. long, the lateral sepal is 48 mm. long and green-yellowish, with brown to purple spots. Lip is 2.8 cm. long, green-yellowish with green or brown spots and with two yellow calli at the base. Short, thick column 5 mm. long.

Habitat: Epiphyte; grows in non deciduous forests.

Flowering season: May to July

Observations: There is variation in the number and intensity of spots around the neck. We have only seen this species in cultivation.

Brassia maculata

R. Br. 1813

■ **Description:** Plant with 10 cm. laterally compressed green unifoliate pseudobulbs. Leaves green, 25 to 30 cm. long, conduplicate at the base. Lateral Inflorescence, cluster with 5 to 12 flowers. The flowers are 10 cm. long, green-yellowish and purple spots. Dorsal sepal is 42 mm. long, the lateral sepal is 48 mm. long and green-yellowish, with brown to purple spots.

Lip is 2.8 cm. long, green-yellowish with green or brown spots and with two yellow calli at the base. Short, thick column 5 mm. long.

Habitat: Epiphyte; grows in wet lowland forests.

Flowering season: May to July

Observations: We have not seen this species so we refer to Hamer (2001).

Brassia signata

Reichembach f. 1881

■ **Description:** Plant with thick roots, unifoliate pseudobulbs, compressed, slightly caniculate, covered with imbricate sheaths. Leaves 12 cm. long, short, conduplicate at the base. Inflorescence is lateral, arched, 40 cm. long and approximately 10 flowers which are small for the genus. Flowers are pale yellow-greenish. Dorsal sepal is 19 mm. long and lateral sepals are 25 mm. long. Petals are 20 mm. long with 15mm. lip, reflexed and with wavy edges, the disc has a double callus. Short, thick column.

Habitat: Epiphyte; known from one report in Nicaragua (Hamer 2001) near the top of Mt. Quiabu on the forest edge of the top, 1500 m.

Flowering season: May.

Observations: Very similar to *Ada chlorops*. Formerly reported as *Brassia mexicana*.

Brassia verrucosa

Lindl 1840

■ **Description:** Plant with oval laterally compressed 4-10 cm. pseudobulbs, bifoliate 30 cm. long. Leaves acute, conduplicate at the base 10 to 20 cm. long and green. Inflorescence, up to ten evenly spaced flowers on a 30 to 40 cm. long, purple peduncle. The flowers are showy, sepals and petals are pale green, with brown spots in the basal portion. White lip with warty green spots and red spots in the base, 20 mm. long, acuminate with a reflexed apex and wavy edges, disc with yellow callus. Short, green column.

Habitat: Epiphyte; or lithophile, grows also grows among dry rocks where it can form large colonies.

Flowering season: May to July

Observations: We have seen several populations of this species in very hot places, in direct sun in Matagalpa and isolated individuals in the oak forest in Estelí at 1100 m. It is easy to differentiate it from the other *Brassia* by its warty lip with green spots. And bifoliate pseudobulb. for this plant to bloom better, it is recommended to pass a dry period.

Bulbophyllum aristatum

(Reichembach) 1866

■ **Description:** Plant with creeping rhizome 5 mm. long, pseudobulbs are 4 cm. long. Leaves are approximately 15 cm. dark green upperside, pale green ventrally. Inflorescence is lateral and grows at the base of pseudobulbs with a 35 cm. long

spike, including the cluster of the flowers that is 9 cm. long. Small, green and purple flowers. Dorsal sepal is 6 mm. long and lateral sepal is adnate on the foot of the column, green outside with purple spots. Very fleshy and articulated lip with the foot of the column, which has a yellow base, the rest is dark purple and 3 mm. long. Column is 2 mm. long with a 1.5 mm. Foot is yellow with purple edges.

Habitat: Epiphyte; grows in Atlantic rain forest.

Flowering season: October

Observations: According to Hamer (2001) the species is rather common in Atlantic slope forest, but we have not found it or seen examples in collections.

Bulbophyllum pachyrachis

(A.Rich) 1850

■ **Description:** Plant with bifoliate quadrangular 2-4 cm. pseudobulbs. Leaves are 15 to 20 cm. long and green. Thick stemmed fleshy pendulous Inflorescence 15 to 20 cm. long. Green-yellowish flowers, the outside of the sepals have red spots and two great red spots inside the lateral sepals. Sepal has many nerves in the outside, with bent edges. Petals with a single elevated vein, obtuse rounded apex, fleshy in the basal portion. fleshy and bent lip, rounded and warty inside throughout apical half, with a small nail. Small column with three teeth, both lateral teeth turgid and longer than the back tooth that is 2 mm. long and a foot in U shape 1 mm. long.

Habitat: Epiphyte in evergreen broadleaf forests.

Flowering season: March.

Observations: We have not seen this species so we refer to Hamer (2001) for the species information.

Calanthes calanthoides

(Rich & Gal) 1845

■ **Description:** Plant that has a reduced stem to abbreviated rhizome. Leaves are green and 45 cm. long, acute and with many longitudinal nerves. Inflorescence with multiple flowers spread along raceme. Peduncle is 25 cm. tall, pale green, floral bract, green and 15 mm. Dorsal sepal is 11 mm. and lateral sepals are 12 mm. long, white with acutely reflexed edges and apex. Petals are 7 mm. long, white, sometimes greenish, fleshy lip, approximately 1 cm. long, yellowish green with purple spots. Short, thick column, 3 mm. long.

Habitat: Terrestrial; grows in humid places on fallen trees; generally grows at the base of the trees.

Flowering season: May to July

Observations: We have seen this species in cultivation without known origin.

Campylocentrum fasciola

(Lindley) 1840

■ **Description:** Plant without leaves, with elongated roots up to 30 cm. long with or without abbreviated stem. Cespitose peduncle, several times is numerous with multiple flowers. The

flowers are small, pale green, can be pale yellow in old specimens. Single nerved sepals and petals, 1.5 mm. long, lateral sepals are 1.4 mm. long. Lip with conspicuous spur, with wide and triangular-oval laminates 1.4 mm. long and wide. Short column.

Habitat: Epiphyte; in cloud forest, lowland rain forest pastures.

Flowering season: Unknown.

Observations: Very inconspicuous without leaves, reported only once, but not necessarily uncommon as the flowers and the plant are exceedingly cryptic. We found it growing on guava twigs.

Campylocentrum micranthum
(Lindley) 1836

■ **Description:** Short stems, completely covered with sheaths. Leaves are leathery and bilobed at the apex, 2 to 8 cm. long. Inflorescence comblike, numerous dense flowers arranged in two rows, small and white-creamy flowers sometimes pink. Similar acute sepals and petals, dorsal sepal is 4 mm. long and lateral sepal is 4.5 mm. long. Petals are 3.2 mm. long, lip is 3.6 mm. long, and with rounded apex that embraces the column. Column, thick, 1 mm. long.

Habitat: Epiphyte; grows 100-700 m. in premontane open forest on the Atlantic slope

Flowering season: Almost all year; mainly March and April.

Observations: Looks like a small epidendrum when not flowering, the most common campylocentrum in Nicaragua.

Campylocentrum schiedeii
Reichembach 1850

■ **Description:** Plant with aerial roots, up to 30 cm. long. Leaves 4.5 cm. long, green. Inflorescence grows underneath the roots, comblike floral spike with two dense rows of small white flowers, floral spike, 4 cm. long. Pale green and white flowers. White lip, 3 mm. long. Sepals at the base are pale green, white towards the apex. White, rounded petals, 1.5 mm. long. Column is 1 mm. long, thick, and white.

Habitat: Epiphyte of open mountainous regions. Also in coffee plantations, small plants that look like Epidendrum, but generally less than three meters above the ground, generally 700-1200 m. above sea level.

Flowering season: October-November.

Observations: Not common, we found it only once at 1200 m. in a branch of a dense Juniper.

Catasetum integerrimum
Hook 1849

■ **Description:** Pseudobulbs are 15-20 cm. long, which when young, are covered in leaves up to the apex; when the pseudobulbs are old they shed the leaves exposing smooth green surface with rings where the leaves fastened, as the dry season pro-

gresses the smooth surface becomes shriveled, especially the older bulbs. Leaves thin with 3 longitudinal green nerves, 20 cm. long. Lateral Inflorescence with 2 to 5 flowers. Male flowers are 5 cm. in diameter. Dorsal sepal is 40 mm. and lateral sepal has the same length but varies in width, inside is green-yellowish, underside with purple spots. Petals are 40 mm. long, same color as the sepals. fleshy lip, green-yellowish in the interior and more or less covered with purple spots. Column is 36 mm. long, with two 25 mm. long anthers in the front. The female flowers have green sepals with white edges. The column is short, thick and 10 mm. long without anthers.

Habitat: Epiphyte, rarely terrestrial; grows in old rotten trees in tropical lands and on fence poles, less common but present at higher altitude up to 1300 m.

Flowering season: Mainly May to October

Observations: Very variable flowers even within the same gender. Male flowers are more common than female flowers. Plants lose their leaves in the dry season.

Catasetum maculatum
Kunth. 1822

■ **Description:** Plant to 60 cm. long, plicate and acute leaves, up to 40 cm. long, articulated with its sheaths. Big flowers that are unisexual male and female produced in separated scapes. Male flowers are more frequent and grow in racemes of up to 14 flowers. Green sepals and petals stained purple or red brown. fleshy, green lip with purple and red brown spots or blotches. The female flowers are relatively rare with two to five flowers and short lip, with fewer purple spots.

Habitat: Epiphyte; grows in the lowlands of dry and moist tropical forests, less common at elevations of up to 1300 m. In higher places it is found on the edge of the forest or isolated trees in windbreaks and especially old fence posts.

Flowering season: May to November.

Observations: Like other Catasetinae, it loses its leaves during the dry season to grow a new pseudobulb with leaves. Flowers of this species are distinguished of those of *C. integerimum* in that those of integerimum have the lip plain while *C. maculatum* has the inside edge hairy.

Caularthron bilamellatum
(Reichembach) 1862

■ **Description:** Fusiform, hollow pseudobulbs to 30 cm. long, sometimes with purple nerves, with two or three leaves. Inflorescence of 6 to 10 flowers. White flowers with a tinge of pink. White and 12 mm. long sepals, with warty apex in the outside. White and 12 mm. long petals. Lip is 9 mm. long, white, with a fleshy, yellow callus. Column is 8 mm. long, white, with wings at the apex.

Habitat: Epiphyte; grows approximately at 300 to 1000 m. above sea level. Mainly in sunny places, isolated trees in open fields, uncommon in closed forest.

Flowering season: January to April.

Observations: These plants produce inflorescences which in smaller plants generally self pollinate without opening the flower. In bigger plants, they open well, with only a few flowers self-pollinating.

Chaubardiella subquadrata

(Schlechter) Garay 1969

■ **Description:** Plant 12 -17 cm. with fleshy roots, without pseudobulbs; leaves green three to five blades from a single base, outer leaves smaller than innermost ones, elongate, lanceolate. Inflorescence unifloral with short stem, much shorter than the leaves; flower uniform yellow, sometimes with red stippling, flower revolute, with lip up, sepals like petals 15-16mm. Lip concave, cordate.

Habitat: Epiphyte in Atlantic rain forest.

Flowering season: June.

Observations: Recently reported for the San Juan River (Diaz 2008) from undisturbed forest.

Chelyorchis ampliata

(Lindley) Dressler & N.H Williams 2000

■ **Description:** With very compressed pseudobulbs, verrucose, up to 12 cm., green-yellowish with small red-brown patches, bifoliate. Leaves are coriaceous, conduplicate, up to 40 cm. long, light green to green yellowish, obtuse to round. Lateral Inflorescence up to 75 cm. long, a muti flower panicle with up to 30 flowers, light green peduncle with purple patches and with small sheaths. Flowers are showy, yellow with red brown patches. Sepals are 9 mm. long, concave, spatulate, rounded on the apex, yellow with big brown or red brown patches. Petals are 11 mm. long, unguiculate, rounded on the apex, same color as the sepals. Lip is patent, unguiculate, 19 mm. long, with small lateral lobes; intermediate lobe is big, deeply emarginate and bilobed apex, with somewhat wavy edges, yellow with few red brown patches, consists of two big teeth and 3 small teeth. Column is short, with 2 dentate auricles and a dentate lobe at the apex.

Habitat: Epiphyte on wet to semi-arid areas with elevated temperatures, usually less than 600 m.

Flowering season: January to March.

Observations: Not very common, it can grow into big plants. Morphologically, it is very different under shade and sunlight. Under sunlight it develops very big pseudobulbs, short leaves, wide and fleshy; while under shade the pseudobulb is small, leaves are long, coriaceous and very vulnerable to direct sunlight.

Chysis bractencens

Lindley 1840

■ **Description:** Fusiform pseudobulbs, 15 cm. long, compressed and sheathed. Leaves are 27 cm. long. Lateral Inflorescence, with cluster of 3 to 5 flowers, grows simultaneously with the new shoot from the base of the pseudobulb. White flowers with yellow spots and red stripes. Dorsal sepal is white

and 4.5 cm. long, lateral sepals have the same length but different width. Lip of the outside is pale yellow, underside is yellow with red stripes. Thick, short column.

Habitat: Epiphyte; grows in cloud forest above 1200 m.

Flowering season: December and January.

Observations: Reported only once in Jinotega; reported flowering season in December and January is surprising since other species begin to sprout during the rainy season.

Chysis bruennowiana

Reichembach f. & Warsz. 1857

■ **Description:** Fusiform pseudobulbs 26 cm. long, when young they are with rough sheaths. Leaves up to 40 cm. long, relatively thin, attenuated towards the base and articulated with the sheaths. Lateral Inflorescence that grows after the shoot, 30 cm. long with 3 to 6 flowers. The flowers are big and showy, gold-yellowish with red stripes, lip with five elevated teeth in center. Dorsal sepal is 35 mm, yellowish, underside is golden and warty; lateral sepals are 25 mm. long. Petals, 30 m. m, same color as the sepals. Short, thick column, outside is white-yellowish, inferior inside is golden with purple spots.

Habitat: Epiphyte; on slopes with humid climate

Flowering season: March and April

Observations: Several species with five teeth show no obvious differences based on the descriptions: *C. aurea*, *C. costarricensis* and *C. laevis*. Among the group, *C. laevis* was the first described, hence we assign the plants that we have seen to this species.

Chysis laevis

Lindley. 1840

■ **Description:** up to 1 m long, pseudobulbs are 60 cm. long. Leaves are 40 cm. long. Lateral Inflorescence, with up to 8 showy flowers. The flowers are fleshy, sepals and petals are yellow-orange, can also be green-yellowish with orange spots; lip is yellow stained with red and with red stripes between and to the sides of the white callus, species with five teeth on the lip. Dorsal sepal is 5 cm. long, lateral sepal is 3 cm. long, Petals are 4.5 cm. long; lip is 3.5 cm. long. Bent column is 1.5 cm. long.

Habitat: Epiphyte; grows on mountains with high humidity at forest edge, 800 m.

Flowering season: April-November

Observations: Similar to *C. costarricensis* and *C. aurea* which all have almost identical flowers and variable pseudobulbs. Both samples we have seen come from the same forest and both have very thin pseudobulbs where the new ones grow about 7-8 cm. From the base of the previous pseudobulb, with up to 10 leaves per pseudobulb. Although it does not correspond to the classic description and it is difficult to assign these plants to one species; we put *C. laevis* because it is the oldest of the three names and we have not seen sufficient material to justify either synonymy nor naming of another one.

Chysis tricostata

Schlechter 1923

■ **Description:** Up to 50 cm. long, with pseudobulbs are up to 30 cm. long, 5-6 leaves 25 cm. long. Inflorescence grows from the base of pseudobulbs with flower clusters of up to 10 flowers. Yellow-orange sepal with red spots and three teeth in the lip. Falcate petals, with reflexed apex. Column is bent, extended towards the apex, clear yellow with red spots.

Habitat: Epiphyte; grows at forest edges in cloud forest at approximately 1000 to 1500 m.

Flowering season: March to May.

Observations: It can grow in lowlands and survive growing at 500 m., but it rarely blooms at low elevation apparently requiring cool temperatures as a cue. This species seems to be the most common in Nicaragua; nevertheless is not common, we have always found it as isolated plants or in small populations of two two or three. Three teeth instead of five is the diagnostic character.

Clowesia russelliana

(Hook) 1840

■ **Description:** Elliptical and conical pseudobulbs 10 cm. long, when young covered in foliar sheaths, with 6 to 8 leaves, when they age they become dark green, shed leaves leaving behind cross-sectional rings. Leaves are 40 cm. long, green and with three longitudinal main nerves. Pendulous lateral inflorescence from the base of bulb up to 40 flowers and 30 cm. long. Hermaphroditic flowers, light-green with dark-green stripes. Dorsal sepal is 35 mm. long and lateral sepal is 40 mm. long, white with longitudinal dark-green stripes, few cross-sectional stripes of paler color. Petals are 35 mm. long, lip is 22 mm. long, light green with dark-green stripes. Column is 2 cm. long, green and without antennae.

Habitat: Epiphyte, grows in open forest between dry forest and premontane forest from sea level to 600 m. in the Pacific slope.

Flowering season: July to September

Observations: Less common and very similar to the *Catacetrum*; less common in the same habitat as *Catacetrum*, but shorter robust pseudobulbs.

Coccineorchis standleyi

(Ames) 1925

■ **Description:** Up to 35 cm. tall, with fleshy roots, long and acute leaves up to 14 cm. long. Floral spike pendent up to 30 cm., partially hidden by long sheaths. Inflorescence in cluster. Yellow flowers, sepals are glabrous, acute and concave, 22 mm. long, falcate petals 22 mm. long, lip is 22 mm. long. Column is 2 cm. long, with glandular hairs in the anterior face.

Habitat: Epiphyte; cloud forest canopy. In Nicaragua it is only known on top of Maderas Volcano;

Flowering season: September-October

Observations: Showy flower but difficult to find out of its flowering time due to the abundance of other Epiphytes in cloud forest.

Cochleanthes flabelliformis

(Schw.) 1788

■ **Description:** Up to 30 cm. tall. Big leaves with prominent nerves, 30 cm. long. Lateral Inflorescence with cream peduncle, 10 cm. long with a single flower. Cream flowers; lip with purple stripes. Thick and acute sepals, dorsal sepal is 28 mm. long and lateral sepal is 33 mm. long. Petals with 5 nerves, 18 mm. long. Lip is 39 mm. long, disc with a callus in fan form, with numerous warty purple nerves. Column with a wide and long foot, short and erect spur in front of the base of lip, 15 mm. long.

Habitat: Epiphyte in cloud forest, grows on areas between 700 and 1400 m. above sea level.

Flowering season: August to November

Observations: Not very common, isolated individuals are found in several high points between Matagalpa and Peñas Blancas. Normally the plant is not very big, but we have seen a developed plant of 50x50 cm.

Coelia macrostachya

(Lindley) 1842

■ **Description:** 80 cm. plant; pseudobulbs with onion shape, up to 10 cm. Lateral Inflorescence many flowered inflorescence, has 3 to 6 leaves light purple flowers; sepals are pale red on the inside, warty and purple and on the external part, pale red, thin petals. Lip is purple with 9 mm. bent, purple apex. The column is 9 mm. long with two teeth at the apex.

Habitat: Terrestrial or epiphytic, in montane forest. In Jinotega, it grows mainly in sunny rocky outcrops where it produces big colonies; it grows above 600 m.

Flowering season: May to August.

Observations: Previously known from a single report (Hammer 2001), we have found it for sale in Esteli and Matagalpa without exact locality and we found wild samples south of the city of Jinotega at 1300 m., but we have not seen it flowering season. Some authors (Ames 1980) regard *Bothriochilus* as a synonym of *Coelia*.

Cobniella ascendens

(Lindley) Christenson 1999

■ **Description:** Generally leaves are pendant, terete, longitudinally sulcate, fleshy, up to 1.5 cm. wide 60 cm. long. Inflorescence is shorter than the leaves, approximately 35 cm., growing from the base of rudimentary pseudobulbs. Flowers are relatively small, yellow with fine red brown patches, 15 mm. Sepals are free, patent, with a small nail at the base. Petals are patent with wavy edges, obtuse, 5 mm. Lip is panduriform, trilobed, 8 mm; lateral lobes are erect, ligulate to slightly spatulate, obtuse; intermediate lobe is finely bilobed, transversely reniform, yellow; disc with a fleshy, big elevated callus with several tubers,

covering the entire isthmus. Column is 3 mm, with 2 arms or conspicuous wings, curved, acute.

Habitat: Epiphyte; wet areas, at 200 m - 1000m. above sea level.

Flowering season: March.

Observations: This is the most common *Cohniella* in premontane forest.

Cohniella cebolleta

(Jacq.) Christenson 1999

■ **Description:** Generally leaves are erect up to 3cm wide, terete, longitudinally sulcate, fleshy, up to 60 cm. Inflorescence is shorter than the leaves, approximately 35 cm., growing from the base of rudimentary pseudobulbs. Flowers are relatively small, yellow with red brown patches, 15 mm. Sepals are free, patent, with a small nail at the base. Petals are patent with wavy edges, obtuse, 5 mm. Lip is panduriform, trilobed, 8 mm; lateral lobes are erect, ligulate to slightly spatulate, obtuse; intermediate lobe is finely bilobed, transversely reniform, yellow; disc with a fleshy, big elevated callus with several tubers, covering the entire isthmus. Column is 3 mm, with 2 arms or conspicuous wings, curved, acute.

Habitat: Epiphyte; grows in dry forest from 0 to 800m. above sea level.

Flowering season: March.

Observations: This is the most common *Cohniella* in dry forest.

Cohniella stipitata

(Lindley) Dressler & N.H. Williams 2003

■ **Description:** Up to 1 m tall. Pseudobulbs are compressed, up to 12 cm., unifoliate, bases are covered with long sheaths having foliar limbs. Leaves are up to 40 cm., linear, obtuse, coriaceous. Inflorescence up to 1 m, including the peduncle with 2 to 3 branches at 7 cm. intervals; peduncle with white and scarious sheaths at the base of the branches. Flowers with brown-olive green sepals and petals, yellowish apex, lip with yellow lobes and a brown-red isthmus. Floral bract is white, scarious, tight, 8 mm. Sepals and petals with strongly wavy edges, acuminate; sepals are dorsally carinate near the apex; dorsal sepal is 16 mm; lateral sepals is almost parallel to the petals, falcate, unguiculate, 19 mm. Petals are shortly unguiculate, 16 mm. Lip is trilobed, with sub-quadrate lateral lobes, a relatively long, narrow isthmus; bilobed, with an apicule on the sinus; the entire lip is 1.6 cm.; intermediate lobe is 5 mm; disc with a callus consisting of 2 transverse teeth on each side near the base, ending on a central tooth which is accompanied by a divergent tooth on either side. Column with 2 short slightly bilobed triangular wings, slightly bilobed; anther with a verrucose lower half.

Habitat: Epiphyte in wet areas. 0-200m.

Flowering season: January to March.

Observations: Formerly known as *Oncidium teres*.

Comparettia falcata

Poepp & Emdl. 1835

■ **Description:** Small bulbs 8 mm. long, covered with 1 to 2 sheaths. Leaves are conduplicate at the base, 7 cm. long. Inflorescence from the base of the pseudobulb, has few flowers with reddish peduncle. Pink flowers with white nerves. Dorsal sepal is concave, 10 mm. long, lateral sepals jointed until the apex. Petals are 10 mm. long, reflexed and carinate. Lips are 17 mm. long; disc with a white callus. Stiff extended column.

Habitat: Epiphyte in humid mountains 900-1300 m., especially on guava trunks they can be locally common

Flowering season: Most of the year.

Observations: Take root in small to medium branches and have relatively short life; easily confused with *Ionopsis* and *Leochilus* if there are no flowers. Both can be in the same place, but generally, the *Comparettia* are a montane species, while *Ionopsis* grow in lowland, *Leochilus* in both.

Corallorhiza bulbosa

Rich & Gal 1845

■ **Description:** Underground rhizome without leaves, column 15 to 20 cm. tall. Inflorescence has 6 to 10 flowers. Flowers are probably green or purple and only partially open. 2 mm. long, obtuse sepals, with bent edges; similar petals. Lip is very similar to the sepals and petals; column is 1.2 mm. long.

Habitat: Terrestrial and saprophytic since it grows on decomposing organic material, also in humid mountains

Flowering season: October.

Observations: We have not seen this species, information taken from Hamer (2001).

Corallorhiza odontorhiza

(Willd.) 1805

■ **Description:** Leafless, with branched rhizome without roots. Thin, green-purple stem. Inflorescence in cluster with 6 to 15 flowers. Green-brown to purple flowers, with lip spotted purple, 2 to 3 mm. long. Jointed sepals and petals; sepals are 3.5 mm. long, short, concave, obtuse and single-nerved petals, 3.2 mm. long. Lip with a short nail, naturally bent, 3.5 mm. long, with wavy edges; discs with a pair of short and elevated calli in half of lip. Thin column, 2 mm. long.

Habitat: Terrestrial and saprophytic; grows on decomposing organic material, also in pine forests and rocks

Flowering season: December to February

Observations: Inconspicuous plant well camouflaged by the lack of showy leaves.

Coryanthes gracilis

Gerlach 1993

■ **Description:** Erect bifoliate pseudobulbs, 7 to 15 cm. long. Narrowly elliptical leaves, 35 to 55 cm. Inflorescence is pên-

dulous from the base of the pseudo bulb, 30 to 55 cm. long, with 2 to 5 flowers. The flowers are big and showy, pleasantly fragrant, yellow or green-yellowish, generally with red or purple spots. Reflective sepals and petals, dorsal sepal is acute to apiculate, 2 to 3.5 cm. long; lateral sepals widely falcate, 5 to 9 cm. long. Petal is twisted, 3 to 4 cm. long. Lip with a narrow nail, compressed. Column is expanded at the apex, 2 to 4 cm. long, with reflexed horns 7 to 10 mm. long.

Habitat: Epiphyte; we have found it repeatedly perched over water in Atlantic coast riveres which are not subject to large variation in water level.

Flowering season: Intermittently throughout the year

Observations: Pseudobulbs are easily recognized resemble greatly elongated Gongora. Myrmecophilous; requires acid environment provided by ants on the roots, without which it is difficult to adapt the plant.

Corymborkis forcipigera (Reichembach) 1854

■ **Description:** Relatively big, with thick, long, deep, root, the overall height is up to 120 cm. Short rhizome, distic leaves 25 cm. long, dark-green, with pronounced nerves. Inflorescence with up to 30 flowers in each group. Medium sized, green and white flowers. Sepal is 25 mm. long, green, somewhat thickened at the apex. Petals are 22 mm. long, white; white lip, 25 mm. long. Column is 23 mm. long, with two hooks in the expanded apical part.

Habitat: Terrestrial, grows on mountains with humid climate in dense forest with little sunlight.

Flowering season: July to August

Observations: Flowers take almost a month to develop. Plants without flowers are easily confused with Sobralital, but these are more delicate with darker green flowers. They rarely develop more than one or two stems on a plant.

Cranichis ciliata (Hbk.) 1816

■ **Description:** Fleshy roots. Generally two basal leaves with pedicel, 4 to 12 cm. long. Limb of the leaf is 10 cm. long, light-green and dark-green. Cylindrical ear, 35 cm. long, up to 40 flowers, the basal region is purple and in the apical region it is green and pilose, covered with green sheaths. Green and white flowers, light-green pedicel. Sepals are 4 mm. long, light-green; petals are 3.5 mm. long, white with green apex and ciliated edges. Concave lip, with bent edges, light-green color with dark green nerves on the disc. Column is 1.5 mm. long, white and acuminate.

Habitat: Terrestrial, grows in the shade of the cloud forest understory.

Flowering season: January

Observations: We have not seen this plant, information taken from Hamer (2001).

Cranichis diphylla

Sw. 1788

■ **Description:** Flexible hairy roots, 25 cm. tall, green leaf 5 cm. long. Petiole is 3 cm. long and a small leaf 2 cm. long. Floral ear is 20 cm. long. 3 cm. of long Inflorescence, with 6 to 10 flowers of green color. Small flowers, with pedicel 4 mm. long, covered with hairs. Greenish sepal 2.5 mm. long, dorsal sepal is concave and lateral sepal is oblique. Petals are 2.5 mm. long, green with rounded apex. Lip is 2.5 mm. long and straight, short glabrous column.

Habitat: Terrestrial in cloud forest.

Flowering season: March

Observations: We have not seen this species, information taken from Hamer (2001).

Cranichis revoluta

Hamer & Garay 1982

■ **Description:** Up to 60 cm. long. Green leaves with conduplicate petiole, 12 cm. long. Floral scape is 60 cm. surrounded by several acute and tight sheaths. Floral bract is 7 mm. long. Green flowers and sepals; white petals and lip. Lip is 10 to 12 mm. Dorsal sepal is reflexed, 7 mm; lateral sepal is 8 mm. with two prominent nerves and another small nerve. Petals with thin wavy edges; concave fleshy lip with thin and reflexed edges rounded to the apex with a central nerve from the base to the center without branches; branched lateral nerves which make up the tallest portion of the lip turning to the outer side; the whole lip is 7 mm. long. Short column, 3.2 mm. long with fleshy wings at the apex

Habitat: Terrestrial in premontane forest.

Flowering season: May to November

Observations: If this species is watered, it continues to flower even when it cannot support the column; under this conditions, floral scape can reach 80 & cm.

Cranichis sylvatica Rich & Gal

■ **Description:** Slightly pubescent towards the top. Leaves with thin winged petiole, 3 cm. long. 40 cm. peduncle covered with tight sheaths; cluster is 5 cm. long with 5 to 10 flowers. White flowers with green spots and stripes on the lip; floral bract is 7 mm. long. Petals are sub-acute at the apex, 3 mm. long, cymbiform lip in natural position, very concave and reflexed superior edges; discs have 3 green stripes divided into spots, the central stripe arises near the apex, laterals are branched. Column is short, white and thick.

Habitat: Terrestrial; in moist refugia and pine forests.

Flowering season: October to December

Observations: We have not seen this plant; information taken from Hamer (2001)

Cranichis wagneri

Reichembach 1876

■ **Description:** Roots fasciculate with one to two leaves; leaf petiole is 5 cm. with a network of longitudinal transverse green nerves, with 3 main nerves, hairy upperside and silver underside. Floral column with a cluster of 8 to 12 small light-purple flowers. Dark green sepal, 4.5 mm. long; in some cases it is olive green with purple nerves; petals are brown with purple; white lip with brown-greenish stripes. Column is short and thick

Habitat: Terrestrial, rarely Epiphyte; grows on branches or soil and in cloud forest slopes above 800 m.

Flowering season: October to January

Observations: Small flower with hairy petals hairy on the inferior inside. Small plant, not showy in the middle of terrestrial vegetation. Flowers while it has its leaves.

Crossoglossa fratrurn

(Schlechter) Dressler 1994

■ **Description:** Plant that has very delicate, thin 10 cm. leaves, has up to 8 leaves. Inflorescence up to 20 cm. of long, covered with sheaths, it is multi- floral. Floral bracts longer than the flower or of equal of length. Acute and narrow white lip. The column is short.

Habitat: Hamer (2001) reports it as an Epiphyte, but we found it terrestrial at 750 m. on Maderas Volcano.

Flowering season: January and February.

Observations: Very delicate plant and not common, we found it only once.

Crossoglossa tipuloides

(Lindley) Dodson 1994

■ **Description:** Up to 40 cm. tall, with roots growing out of the nodes. Stems are approximately 10 cm. long, covered in leaves from the base. Leaves are distic, acute, membranous, lamina is 5 to 6 cm. long, with a 3 to 4 cm. long petiole. Inflorescence is longer than leaves, up to 35 cm. long, raceme, loosely multifloral; rachis and peduncle are hexagonally winged. Flowers with a 10 mm. pedicel ovary and a 10 mm. long floral bract, largely acuminate, pale yellow. Sepal is uninerved, 6 mm. long with curved edges; petals are 5 mm. long, reflexed, shortly linear, acute, uninerved. Lip is acute, with a thick nail and two elevated calli; limb is 8 mm. long, with finely serrate or ciliated edges; with a thickened central nerve along the lip. Column is erect, short and thick.

Habitat: Terrestrial in cloud forest.

Flowering season: Mainly in July.

Observations: Easy to recognize, recently changing genus from *Malaxis*. Solitary plants scattered from 800 to 1200 m. on Mombacho Volcano.

Cryptarrhena lunata

R. Br. 1816

■ **Description:** 30 cm. long with short and creeping rhizome; does not have pseudobulbs. Leaves erect, oblique, coriaceous and articulated leaves with imbricate sheaths; up to 25 long. Thin peduncle, 27 cm. long including cylindrical and multiple flowered cluster. Small, fleshy and green-yellowish flowers. Green sepals shortly acuminate, dorsally carinate, concave, 3.2 mm. long. Green, fleshy petals, 3 mm. long. Yellow lip with fleshy nail, with a fleshy erect callus. Short and fleshy column.

Habitat: Epiphyte in wet shady places.

Flowering season: October, November

Observations: Information taken from Hamer (2001) since we have not seen this plant.

Cryptarrhena quadricornuta

Kranzlin 1922

■ **Description:** erect, 7 cm. long. Compressed, unifoliate pseudobulbs, up to 1.5 cm. long. Two leaves on the pseudobulb apex and four other leaves at the base, articulated and conduplicate at the base, shortly acuminate on the apex, 6.5 cm. Inflorescence from the base of the new shoot, 10 cm. long including the 4 cm. long peduncle with three acuminate and patent 8 cm.-long sheaths with up to 20 flowers. flowers pale green, small and hanging, half of the basal lip is white. Floral bract is lanceolate and acuminate, 5 mm. long, oblique laterals. Uni-nerved, attenuated petals with apical erose edges, 4.5 mm. long. 5 mm. lip with a 2 mm. nail, short triangular-apiculate apex; nail with a short, longitudinal callus that grows up to 1 mm. long. Column is 2.5 mm. long, antenna, cordate with two acuminate teeth on the underside.

Habitat: Epiphyte; grows in moist low lands.

Flowering season: June and July

Observations: We have not seen this species; information from Hamer (2001).

Cryptocentrum latifolium

Schlechter 1923

■ **Description:** Plant to 20 cm. without pseudobulbs, generally few leaves arranged in spiral pattern. Leaves green to 3cm long, 1.5-2mm. wide conduplicate obtuse fleshy. Inflorescence unifloral from leaf bases. Flowers stand out beyond leaves, uniformly orange- yellow., sepals 3 cm. Petals 1.5cm lip lanceolate 1.5 cm. orange yellow with red base. Column long, 4 cm. straight lower third covered by a sheath.

Habitat: Epiphyte in Atlantic rain forest.

Flowering season: April

Observations: This species is rare in Nicaragua, just reported from the lower San Juan River. We have only seen pictures and don't have much formation in about it.

Cuitlauzina pulchella

(Batem.ex Lindl.) Dressler & N.H. Williams 2003

■ **Description:** With dark green pseudobulbs, compressed, 9 cm., bifoliate. Leaves are apical, short, green, 35 cm. lateral Inflorescence, 40 cm., raceme with 2 to 8 flowers, peduncle is very compressed, green to green-purple, with brown sheaths which are 2 to 2.5 cm. Flowers are fleshy, pale violet. Sepals are acuminate; dorsal sepal is 18 mm; lateral sepals are 18 mm. and connate up to the lower half, white, occasionally pale violet. Petals are 16 mm, white, acuminate and acute. flower, very fleshy and complex in its shape, white, upper half in a 90° angle at the lower half, which has 2 big yellow calli with red brown patches and consists of 2 elevated carinae which are 7 mm. Column is white and 4 mm, trilobed at the apex, with dentate lobes.

Habitat: Epiphyte; on wet mountains.

Flowering season: November to January.

Observations: We have not seen this species; information from Hamer (2001).

Cyclopogon comosa

(Reichembach f.) Burns-Bal. & E.W. Greenw. 1986

■ **Description:** Small plant, 20 cm. with thick fleshy roots. The leaves are present during flowering, are clear-green with two white-silver stripes. The floral scaphe can measure up to 17 cm., covered with several acute, tight sheaths, clear- purple color, with approximately 5 to 10 clear-green to brown flowers. Brown sepals with white hairs on the outside. The petals are translucent 5 mm. long, with a green nerve. Lip is white, 8 mm. long.

Habitat: Terrestrial in closed cloudforest above 1000 m.

Flowering season: January to March

Observations: Easily recognizable plant by its attractive foliage. Very showy, some others e.g. *Sarcoglottis* also have white striped leaves, but bigger and more elongate leaves.

Cyclopogon cranichioides

(Griseb.) 1920

■ **Description:** 20 cm. plant with thick and fleshy roots has a 40 cm. long stem, leaves with purple nerves on underside. The Inflorescence is up to 10 cm. of length with up to 30 to 40 flowers, in multi- flowered clusters. Flowers are pale green and white. The petals have a purple edge and a central nerve. White lip, with two calli. Column 3mm. long.

Habitat: Terrestrial plant that grows on coastal plain and rain-forest in the Atlantic Coast.

Flowering season: February-March

Observations: We found this species rather common along the San Juan River epiphytic as well as terrestrial.

Cyclopogon elatus

(Sw.) Schlechter 1919

■ **Description:** Plant with green acuminate leaves. Floral scape glabrous with several 5 cm. sheaths low and up to 2 cm. above of length. The Inflorescence is clumped, with 20 green hairy flowers, with greenish white lip. Flowers, bunched, with greenish white, with narrow 12 mm. bract. Outer sepal is dark green. Petals are green. Apiculate column, with a Pilose front that measures 3 mm.

Habitat: Terrestrial plant of montane forests.

Flowering season: January to April

Observations: We have not seen this species; information from Hamer (2001).

Cyclopogon miradorensis

Schlechter 1925

■ **Description:** Plant up to 25 cm. long, with uniform green leaves, wavy edges. Its Inflorescence has approximately 20 & pale green flowers. Sepal has a dull-pale color outside, with white hairs. Lip 7 mm. long with two small fleshy calli at the base. Column 3 mm. long, white color.

Habitat: Terrestrial plant that grows in cloud forest 1000 m.

Flowering season: February and March.

Observations: Very local, we found a small population once in a wet canyon south of the city of Jinotega.

Cyclopogon obliquus

(J.J.Sm.) Szlach. 1994

■ **Description:** 35 cm. tall, with thick, fleshy, roots, with small basal leaves, 4 to 6 cm., generally absent during the flowering season, with a 2 to 3 cm. petiole. Floral stem is 35 cm. tall. Racemose inflorescence, 12 to 20 greenish flowers with white lips. Floral scape is erect, covered with several 2.5 cm. glabrous acuminate sheaths from the base to 1 cm. up. Floral bract is 1 cm., acuminate. Dorsal sepal is 4 mm, outside is pubescent, concave; lateral sepals are 5.5 mm, all with a green central nerve; lateral sepals are connate and form a conspicuous chin on the foot of the column. Petals are adnate with the dorsal sepal, central nerve and basal portion are greenish. Lip is 5 mm, with two appendages, translucent at the base, lateral edges of the basal two thirds are curved, apical portion is dilated, white, truncate. Column is 5 mm, thin; rostellum is ligulate, bifid.

Habitat: Terrestrial; grows in tropical wetlands.

Flowering season: March.

Observations: We have not seen this species; information from Hamer (2001).

Cyclopogon prasophyllus

(Reichembach f.) Schlechter 1920

■ **Description:** Plant with green leaves, attenuated towards the apex and bases, acute and with thin petiole. Florescence

from the base of the leaves with 15 cm. of length. The flowers are pale green and labelum is white, which has three nerves, one from the base to the apex, and the other two from the base to half of the labelum. Column of 2mm. of length.

Habitat: Epiphyte plant, grows in cool climate and closed canopy broad-leaf cloud-forest also forest edges on the main trunks of trees from 0-2m above ground, 700 m. to 1000 m. above sea level.

Flowering season: February

Observations: This species is not rare in undisturbed forests but its flowering period is short and very synchronized throughout the country. It is distinguished of the other *Beadleas* of the area by being an Epiphyte.

Cycnoches egertonianum

Bateman 1843

■ **Description:** Pseudobulbs 15 cm. long, almost cylindrical and attenuated to the apex, when young they are sheathed but when old they are smooth and ringed. Leaves are up to 25 cm. long, acute and articulate with green sheaths. Inflorescence pendulous, Unisexual, dimorphic flowers. Males: 45 cm. long pendulous, 25 green or dark-purple flowers with pedicel and bract each to 15cm; dorsal sepal is 32 mm. long and lateral sepal is 30 mm. long, strongly reflexed; lip touching the column, erect, nail next to the foot of the column, rounded sheet with 8 appendages and another on the center of the sheet. Acute, curved column, open to the apex, 22 mm. long. female cluster: one to two flowers, with 5 cm. long peduncle. Petals are 32 mm. long with thin and reflexed edges; lip with a 5 mm. long, thick, fleshy nail on top. Sheet is 20 mm. long, convex, with inside darker than the exterior, very fleshy. Column, curved and dilated at the apex, 15 mm.

Habitat: Epiphyte; in pre-montane to montane forest.

Flowering season: June to September

Observations: We have seen it flower in Costa Rica and have found it in Ometepe Island 300 m. From Maderas Volcano in a premontane forest

Cycnoches guttulatum

Schlechter 1922

■ **Description:** Cylindrical 20 cm. pseudobulbs with approximately 6 leaves. Leaves are 20 cm., conspicuously nerved. Pendulous, 30 cm. Inflorescence with approximately 12 flowers. Floral bracts are 15 mm. long and the ovary is purple, 20 mm. long. Green flowers with white lip. This species has five instead of four lobes on each side of the lip; the middle lobe is triangular, the two lobes are basal planes and a nail with a small callus.

Habitat: Epiphyte; grows in wet tropical climates.

Flowering season: July

Observations: Information taken from Hamer (2001) because we have not seen this species.

Cycnoches pachydactylon

Schlechter 1922

■ **Description:** Cylindrical pseudobulbs, up to 26 cm. long. Elliptic flowers, acute, 22 m long with three prominent nerves, articulate with its sheaths. Male Inflorescence: Curved, pendulous, up to 80 cm. long with approximately 35 evenly spaced flowers 1.5 to 3 cm. apart. Flowers with green sepals and petals, white lip and 2 basal green appendages, white apex, callus with a brown nail. Floral bract is 1.3 cm. long, sepals are 2.5 cm. long, acute; dorsal sepal is 7 mm. wide and lateral sepals are oblique and 10 mm. wide. Petals are 20 mm. long, sub-acute; lip is 2 cm. long, including the 1.2 cm. long nail; half of the basal nail has an oval callus as wide as the nail. falcate, nailed column, 2 cm. long

Habitat: Epiphyte in humid lowlands.

Flowering season: July.

Observations: Similar to *C. stenodactylon* but its lobules are triangular, widest at the apex. The difference in the bulbs and leaves between both species disappear observing a larger sample of plants than those Hamer had available. We have not found flowers that show the characteristics of this species and it may be a synonym of *C. stenodactylon*.

Cycnoches stenodactylon

Schlechter 1922

■ **Description:** Cylindrical pseudobulbs, up to 25 cm. long, with 3 to 8 leaves measuring up to 25 cm., conspicuous nerves. Pendulous Inflorescence up to 50 cm. long with a cluster of up to 20 male flowers. Green flowers with a white disc on the lip. Two prominent lobes and four on each side with finger shape, wider on the apex than at the base. female flowers: 2 to 4, rigid cluster, 15 cm. long, 7 cm. wide. Green very similar to *C. ventricosum* flowers. Dorsal sepal is 23 mm. long, acute; lateral sepal is 20 mm. long, green, oblique. Petals are 20 mm. long, similar to lateral sepals; lip united to the column. Column is very thin and nailed.

Habitat: Epiphyte; grows on tropical forest 800-1400 m.

Flowering season: August to October.

Observations: Flowers well growing at low elevation, female flowers are less common than males but the same plant can produce both.

Cycnoches ventricosum

Bateman 1837

■ **Description:** Conical-cylindrical pseudobulbs, attenuated to the apex, sheathed and when young they have up to 10 articulated leaves with sheaths and when old they are naked and ringed. Green leaves measure up to 30 cm. Lateral inflorescence in cluster with female and male flowers that do not differ much in appearance. Male flowers have 1 to 8 flowers and are more frequent, green-yellowish, 12 cm. long. female flowers have the same color as male flowers but are thicker, bigger and compact. Dorsal sepal is 6 cm.; lateral sepals are 5.5 cm. long, green-yellowish, reflexed. Petals are 5.5 cm. long. outer lip of

the flower is 4.5 cm. long, acuminate disc, thick and fleshy, white and dark-green callus, at the base of the disc there is a dark green spot. Column with male flowers, elongated and curved 4 cm. long; column with female flowers is thicker and only 3 cm. long, dilated at the apex.

Habitat: Epiphyte; grows on moist mountains at 800-1400 m.

Flowering season: June to October.

Observations: Grows at lower elevation than *C. stenodactylon*, flowers are bigger and less numerous, but pseudobulbs and leaves are similar to other *Cynoches*.

Cyrtopodium maculatum

■ **Description:** Up to 160 cm. with erect, rigid and fusiform pseudobulbs up to 80 cm.; when young they are covered with foliar sheaths, when old, they are naked and ringed. Leaves up to 80 cm. attenuated to the base with very pronounced longitudinal nerves. Inflorescence is panicle with multiple flowers that grow with the shoot at the base of the pseudobulbs, up to 1.5 m long, with big and inflated sheaths, 6 cm. long and green-yellowish with purple spots. Floral bracts are green-yellowish with purple spots, 1.3 cm. long. Sepals are green-yellowish with purple spots, 20 mm long, rounded and with wavy edges. Petals are yellow with variable spots, 17 mm long, rounded and less wavy. Trilobed lip with lateral curved edges, 1 cm. long, curved and with a prominent foot, yellow in the basal portion, including the foot, and green up to the apex.

Habitat: Lithophyllic; grows on rocks and volcanic lava with little shade.

Flowering season: March to May

Observations: This species is locally common and forms big colonies. Good drainage is essential for this species, many attempts to grow it fail because the excessive humidity makes the roots rot; however, these can grow well potted with porous lava and little organic material.

Deiregyne hemichrea (Lindley) Schlechter 1920

Distribution: Plant up to 70 cm. high. In nature it does not possess leaves in the flowering season. Inflorescence long and multi flowered, the flowers are white and the sepal is green, the center of the lip is also green. Apex round and the disc with auricles is green.

Habitat: Lithophilic plant, locally abundant in very dry rocky habitat, especially rocky substrates at approximately 900 m. above sea level.

Flowering season: December and January

Observations: Growing with access to water, this plant changes its behavior completely, preserving its leaves and flowering season later. In the nature it completely disappears for four or five months of drought and then grows back from fleshy roots.

Dichaea brachypoda

Reichembach 1866

■ **Description:** Secondary stems 15 to 20 cm. long, completely covered with dictic foliar sheaths. Dictic, acuminate leaves, 3 to 4 cm. long, articulated with its veins, upper side is green and underside is glaucous. Inflorescence with one flower; sepals are 8 mm. long, underside is brown-purple, inside is white with purple spots; dorsal sepal is 2.9 mm. wide, lateral sepals are falcate, 3.2 mm. wide on their bases. Petals have the same color as sepals, 8 mm. long, fleshy lip with 7 nerves and a wide nail, dilated to the apex. Column is 3 mm. long

Habitat: Epiphyte; grows in cloud forest on trunks.

Flowering season: June

Observations: Different from all other *Dichaea* of Nicaragua by is softer leaves and almost uniformly white flowers almost without spots.

Dichaea dammeriana

Kranzlin 1923

■ **Description:** Up to 40 cm. long. Leaves are persistent, brown-green, apiculate and ciliated on the apex, carinate, 25 mm. long. Inflorescence, solitary glabrous flower, peduncle, 15 mm. long. Flowers with green-yellowish sepals and petals; lip and column are white. Warty sepal on the outside, 7 mm. long. Petals are thinner, concave with a warty line along the central nerve. Column is wide, arched, top is pubescent with a thin ligula finely ciliated on the apex directed downwards.

Habitat: Epiphyte; in cloud forest.

Flowering season: April to August

Observations: Very similar to *D. verrucosa*; regarding sepal texture, the difference is that it has pointy leaves.

Dichaea fragrantissima ssp. *eburnea*

Dressler & Pupulin 2001

■ **Description:** Secondary stems 15 to 25 cm. long, completely covered with dictic foliar sheaths. Dictic, acuminate leaves, 3 to 4 cm. long, articulated with its veins, top is green and underside is glaucous. Inflorescence with one flower; sepals are 8 mm. long, underside is brown-purple, inside is white with purple spots sweet flowery smell; dorsal sepal is 2.9 mm. wide, lateral sepals are falcate, 3.2 mm. wide on their bases. Petals have the same color as sepals, 8 mm. long, fleshy lip with 7 nerves and a wide nail, dilated to the apex. Column is 3 mm. long

Habitat: Epiphyte; grows in cloud forest on trunks.

Flowering season: March to July

Observations: Very similar to *D. brachypoda* but fragrance is diagnostic.

Dichaea glauca

(Sw.) 1833

■ **Description:** Erect stems, completely covered with foliar sheaths, 40 cm. long. Leaves are numerous, densely packed,

dictic, articulated with 27 mm. long sheaths, from the center of the stem to the apex, with carina on the underside that can be green to light-blue. Inflorescence occurs with solitary white- to grey-white flowers that grow on the underside of the leaf. Dorsal sepal is 11 mm. long, lateral sepal is 12 mm. long, white almost transparent petals are white and lip is 7 mm. long, firmly joined to the foot of the column with a thick, fleshy nail. Column is short, 3 mm. long, thick, white with red spots, and apex is erect and triangular, white with purple edges on the underside beneath the stigma.

Habitat: Epiphyte, rarely terrestrial; grows in cloud forest 1000-1400 m.

Flowering season: May

Observations: This plant flowers very well in its natural habitat. Even though it can survive in hotter areas, it does not bloom there. It is one of the easiest *Dichaea*s to identify

Dichaea graminoides

(Sw.) 1788

■ **Description:** Up to 20 cm. long, patent to erect, with secondary simple stems, compressed, covered with foliar sheaths. Leaves are dictic, alternate, articulate with its sheaths. Inflorescence with one flower. Flowers are white with purple spots on the dorsal sepal and half of the posterior side of the petals. Lip is cream with a yellow callus; it has 7 fleshy nerves; disc with a big and fleshy callus in the basal half that extends to more than half the lip where the callus is free and rounded. Column is 3 mm. long, with ciliated ligula, short beneath the stigma.

Habitat: Epiphyte; grows on low mountains.

Flowering season: June.

Observations: The only Nicaraguan *Dichaea* we have not seen.

Dichaea hystericina

Reichembach 1869

■ **Description:** Very small dense caespitose plant, forming distinct clumps, not creeping. Semi-erect to 15 cm. stem 1mm. concealed by leaf sheath. Leaves to 11mm. elliptic lanceolate recurved apex. Leaf margin ciliate, serrate. Flowers 6mm. greenish to yellowish, disk with fleshy three toothed callus; column long 4mm. for flower Capsule ellipsoid densely pubescent.

Habitat: Dry forest 1000-1200 m. on pine trees.

Flowering season: October, November

Observation: Size similar to *D. tuerckheimii*, differs in being much more dense, forming distinct compact clumps in dry habitat. Capsule like typical *Dichaea* whereas capsule of *D. tuerckheimii* is glabrous. This is a new record for Nicaragua.

Dichaea morrisii

Fawc. & Rendle 1910

■ **Description:** Erect and sometimes pendulous, up to 40 cm. Stems are surrounded by conduplicate sheaths and wide dictic flowers. Inflorescence occurs with one flower produced by the

axil of the distal leaves, generally on the underside. Flowers are big for the genus, sepals and petals are pale-green with violet stripes, lip is violet. Sepals are acuminate, concave, with finely ciliated edges, 12 mm. long, lateral sepals are oblique. Column is robust with a pubescent ligula beneath the stigma

Habitat: Epiphyte; grows in dense virgin forests, but not always at high altitudes; we found it in Costa Rica at 300 m. in Braule Carillo.

Flowering season: February, March

Observations: A little like *D. glauca* but more robust, the most robust of Nicaraguan *Dichaea*s; we have found it in Costa Rica but not in Nicaragua.

Dichaea muricatoides

Hamer & Garay 1974

■ **Description:** Compressed stems, covered with foliar sheaths, 3 mm. wide, light green with few dark-green spots. Leaves are dictic and twisted, all leaves are 20 mm. long, not articulated with their sheaths, underside is carinate abruptly apiculate, green and glabrous. Inflorescence is axilar, with one flower, short peduncle. Flowers are salmon with purple and violet spots. Sepal is orange and even brown-yellowish, interior is glabrous and exterior is warty, in the interior portion with purple spots. Petals are 9 mm. long, brown-yellowish; underside is glabrous with irregular purple and violet spots, outsidewithout spots but a little verrucose. Lip is 7 mm. long, fleshy, plane, including lateral arms. Column is 4 mm. long, green-yellowish with purple spots.

Habitat: Epiphyte; grows in montane cloud forest and old coffee plantations at 1200-1400 m.

Flowering season: March, September

Observations: In the same forests as *D. neglecta*, but less common and bigger than this one. Flowers are very different, bigger and more showy than other creeping *dichaea*s, also lack of spots around the leaf base distinguish it from *D. neglecta*.

Dichaea neglecta

Schlechter 1918

■ **Description:** Caespitose, branched, compressed stems, covered with foliar sheaths, light green with conspicuous dark green spots around the leaf bases. Leaves are not articulate with their sheaths green with dark green spots, especially on the underside, 6 to 10 mm. long. Inflorescence: solitary flower on upper side. Sepal is 7 to 9 mm, green-yellowish with dark purple spots and petals have more purple spots, measure 7 to 8.5 mm. long. Lip with a fleshy nail; column is short and thick with a pilous ligula beneath the stigma

Habitat: Epiphyte; montane, approximately 1200-1500 m., lithophyllic in drier places; Epiphyte in forests

Flowering season: Mainly from August to November

Observations: Differs from *D. muricatoides* in the same forests in that the base of the leaves have purple spots and the leaf is shorter than *D. neglecta*. Sometimes the plant can surround

whole trunks. It is difficult to remove it from its habitat even though it can survive dry periods with its adhesive roots that do not grow again if torn off the original substrate. One of the most common *Dichaea*s in Nicaragua.

Dichaea panamensis
Lindley 1833

■ **Description:** Patent to pendulous, forming clumps, up to 15 cm. long, has short, fleshy roots, and compressed stems. Leaves are dictic, articulate with their imbricate, linear sheaths, up to 30 mm. long. Lateral Inflorescence, with a single flower from the axil to the leaf-sheath. Flowers are green-white with light-violet spots. Dorsal sepal is 6 mm. long, lateral sepals are 8.5 mm. long. Petals are oblique and falcate, 6 mm. long. Lip with a fleshy nail, 7 mm. long, including the nail that is 2 mm. long. Column is 3 mm.

Habitat: Epiphyte in wet Atlantic coast forest. We found them near San Carlos in Río San Juan.

Flowering season: January to April.

Observations: The plant is very similar to *D. graminoides*, but the flower is more spotted.

Dichaea pendula
(Aubl.) Cogniaux, 1903

■ **Description:** Pendulous, creeping branched stems, completely surrounded by foliar sheaths, very compressed, 6 to 7 mm. wide, including the sheaths. Leaves are dictic and alternate, green, not articulate with sheaths. Inflorescence with a solitary flower from the axil of the upper sheaths; green-yellowish with purple or orange spots and purple peduncle. Sepal is 10 to 12 mm. long; exterior is concave, green-yellowish with purple spots. Lip is green-yellowish with purple spots, with a fleshy nail. Column is short, thick, and green with few purple spots.

Habitat: Epiphyte; moist mountains, approximately at 1200 m.

Flowering season: Mainly in May

Observations: Less common than *D. neglecta* and *D. muricatoides* and unlike either of these, exterior of sepals warty. It is a creeper and adheres to the trunks of big ferns and trees.

Dichaea poicillantha
Schlechter 1923

■ **Description:** Generally pendulous, 30 cm. long with stems slightly compressed and completely covered with sheaths. Leaves are patent, dictic and alternate, not articulate with their sheaths, dorsally carinate, size is variable, 6 to 11 mm. long, green with some dark green spots. Flowers with ocraceous sepals and petals, sepals have few violet spots, petals are abundantly covered with violet spots. Lip is dark violet with a white nail

Habitat: Epiphyte; grows in wet mountains.

Flowering season: All year.

Observations: Very similar to *D. muricatoides*; leaves are denser, wider, and shorter.

Dichaea trichocarpa
(Sw.) 1833

■ **Description:** Cespituose, up to 40 cm. long, compressed stems. Leaves are dictic, alternate with reflexed edges, dorsally carinate, 12 mm. long, and sheaths with dark green spots. Solitary inflorescence with a 7 mm. long peduncle. Flowers with cream to white sepals and petals; white lip with a little pink. Sepals are patent and concave, acute and verrucose on the outside, 7 mm. long. Column is short and fleshy, 4 mm. long.

Habitat: Epiphyte; grows in, cloud forest understory.

Flowering season: regularly all year

Observations: We have seen this species in the Lankester gardens Costa Rica, we have not seen in Nicaragua

Dichaea trulla
Reichembach 1866

■ **Description:** Compressed stems up to 70 cm., basally leafless. Leaves are limber up to 10 cm. long, articulate with sheaths. Inflorescence: solitary flowers with a thin 3 cm. long peduncle growing from the axil of the superior sheaths. Patent flowers with yellow-greenish sepals and petals, and a dark purple lip sometimes spotted. Sepals are concave, 9 mm. long; petals are concave, slightly verrucose on the outside, 8 mm. long. Lip with a nail and short, concave, fleshy teeth, 9 mm. long. Column and anterior edges and the apex pilose, 7 mm. long.

Habitat: Epiphyte; grows tropical rain forest.

Flowering season: July to September.

Observations: We have seen this species only once along the San Juan River.

Dichaea tuerckheimii
Shlechter 1923

■ **Description:** Creeping and branched, leaves not spotted or ciliated. Leaves are dictic, and alternating, continuous with imbricate sheaths, 3 to 6 mm. long. Inflorescence with solitary flowers from the axil of the upper leaves. Flowers with 2 mm. long bract, small; white petals and sepals covered with violet spots; white-yellowish lip with few spots. Sepals and petals are similar, 5.5 mm. long. Lip with short fleshy nail, 4 to 5 mm. long, including the nail. Column is fleshy, glabrous and 2 mm. long.

Habitat: Rare Epiphyte, in cloud forest above 900 m.

Flowering season: August to November

Observations: Tiny *Dichaea*s come down to this species and *D. histicina* which are easily separated because *D. tuerckheimii* is less dense, branched, and creeping. Also glabrous seed pods separate this from all other Nicaraguan *Dichaea*s.

Dimerandra emarginata

(GFW Meyer1818)

■ **Description:** Erect, up to 60 cm. long, flexible stems and bulbous at the base. Leaves are dictic, articulate in sheaths, up to 8 cm. long. Inflorescence abbreviated, few flowered, cluster; flowers are violet-pink, with white patent callus. Petal with a sulcate central nerve, 11 mm. long, attenuated at the base. Lip is apiculate, 11 mm. long; disc with a tuberculate callus on the nail. Column is 6 mm. long with two long wings on the apex.

Habitat: Epiphyte; grows near rivers or oceans, humid and dense marsh, open forests and in fencerows.

Flowering season: August to April

Observations: Flowers usually cleistogamous. Although we found plants with flowers that correspond to the description of all three Nicaraguan species, the stem and foliage characteristics are identical among all three, because of this we are not convinced that these are different species. Since the majority of flowers do not open, there are many unclassified plants. *D. emarginata* reportedly has a more acute and truncate lip, it is the most common species of the three, especially in the Atlantic slope between 200-400 m.

Dimerandra lamellata

(Linley) 1843

■ **Description:** Erect to patent secondary stems, attenuated at the base, to 40 cm. long. Leaves are 10 cm. long, articulate with sheaths, dictic and obtuse. Inflorescence is terminal, cluster with few successive and showy flowers, violet-pink. Sepals are 12 mm. long; petals are 12 mm. long; and lip is 12 mm. long widely rounded and shortly apiculate at the apex; disc with a white-yellowish callus with several irregular yellow tubercles. Column is 6 mm. long with two conspicuous wings on the apex.

Habitat: Epiphyte; in wet lowlands.

Flowering season: August to November.

Observations: see *D. emarginata*, it can be distinguished based on the shape of the lip being lanceolate while the others species have truncate lips; less common than *D. emarginata*, which was also considered a valid species in Hamer 1983, and as a synonym in 2001 by the same author, for us it is not clear whether the species is valid. In our experience the plants which produce flowers with lanceolate lip always produce them if they open.

Dimerandra latipetala

Siegerist 1985

■ **Description:** Erect, up to 60 cm. tall. flexible stems, slightly bulbous at the base, leaves are dictic, articulate in sheaths, up to 8 cm. long. Inflorescence, paucifloral, scabrous with triangular bracts. Flowers are patent mostly cleistogamous, violet-pink with a white callus. Sepals are concave and apiculate, 14 mm. long; petals are attenuated at the base, 13 mm. long. Lip is circular, sulcate in the basal portion, 13 mm. long. Column is 6 mm. long with two long apical wings

Habitat: Epiphyte; grows on low plains and islands at sea level.

Flowering season: November and December.

Observations: Another one to compare to *D. emarginata* and *D. lamellata*, the difference mainly lying on the wider and more robust lip. This is also less common than *D. emarginata*, it can be treated as a variation of the flower's shape since it is found in the same habitat with other species and it is distinguished principally by the lip.

Dinema polybulbon

(Sw.) Lindl., 1831

■ **Description:** Pseudobulbs are 1 to 1.5 cm. apart, with creeping rhizome, 10 mm, slightly compressed, green yellowish. Leaves are shiny green, pseudobulb apices are 15 mm, emarginated. one Inflorescence, rarely with two flowers. Flower is whit brown. Sepals are 9 mm, brown-yellowish. Petals are 9 mm, with the same color as the sepals. Lip is adnate to the base of the column, 9 mm. Disc is dilated and with wavy edges, white to white yellowish; nail is 2 mm. wide, thickened, yellowish. Column is 5 mm, with 2 conspicuous extensions at the apex, white with purple patches.

Habitat: Epiphyte in wet areas with variable climate, 800-1500 m.

Flowering season: June to September.

Observations: Creeping and can form plants that measure up to 40 x 40 cm. but we have not found more than isolated plants.

Domingoa purpurea

(Lindley) van den Berg & Soto Arenas 2007

■ **Description:** With 5 cm. long secondary stems, terete underneath, thickening upwards, completely covered with scarios sheaths, unifoliate. Leaves are fleshy, thick, very variable in size, up to 13 cm. long, acute, light and dark green on both sides. Terminal Inflorescence of the stem, up to 50 cm. long, raceme with few flowers, purple peduncle, completely covered with brown sheaths. Terminal or lateral flowers of the peduncle, 9 mm. long, intense purple, opens little, with 8 mm. long pedicel ovary. Sepals are purple, 7 mm. long; lateral sepal is somewhat connate and oblique, forming a small chin. Petals are 6.5 mm. long and have the same color as the sepals. Lip is adnate halfway up the column, forming a sac at the base; the free portion has an "S" shape and is dilated towards the apex, the total length is 9 mm, purple; the intermediate portion is short, whitish with few purple patches. Column is 7 mm. long, purple, dilated apex and with a more intense color, with 2 auricles.

Habitat: Epiphyte; in pines and cypress forests, 600-1200 m.

Flowering season: March to July.

Observations: Very local in pine forest.

Dracula pusilla

(Rolfe) 1893

■ **Description:** Short secondary stem. Leaves up to 18 cm. long, attenuated to the conduplicate petiole. Inflorescence

is solitary, pendulous, p to 14 cm. long. Flowers are white or creamy with red spots and stripes. Dorsal sepal joined to lateral sepals 4 mm. From the base. Petals with thick rounded apex, 2.1 mm. long. Lip is bent, 3.2 mm. long; disc with thick callus along the lateral nerve and a warty callus. Column is 3 mm. long, contracted to the apex, an acuminate tooth with long filiform extension.

Habitat: Epiphyte; grows in dwarf forests with cold climate above 1200 m.

Flowering season: July

Observations: We have not found this species in Nicaragua, but in Costa Rica it is the most common *Dracula*.

Dracula vespertilo

(Reichembach) 1873

■ **Description:** Obsolete secondary stems, base is covered with scarious sheaths. Leaves are attenuated towards the base to a conduplicate petiole, 15 cm. long. Inflorescence with one flower, occasionally two. Flowers up to 12 cm. diameter with a green-yellowish base that has brown spots. Petals are white-greenish with a red central nerve. Label is cream; dorsal sepal is 1.5 cm. long with a filiform cauda, 4.5 cm. long; lateral sepal is 1.7 cm. long. Petals are fleshy, 5 mm. long, widely rounded at the apex. Lip is 5 mm. long with a reflexed callus on each side of the nail. Column is thin with a toothed apex, 5 mm. long.

Habitat: Epiphyte; on big moss-covered trees in cloud forest above 1200 m.

Flowering season: January

Observations: We have not confirmed this species in Nicaragua even though we have found places in which the leaves look like *Dracula*, but we have not seen them flower so we cannot assign a species. It seems that they do not adapt to lower elevations/warmer temperatures.

Dressleriella hispida

(L.O. Williams) 1940

■ **Description:** Up to 5 cm. long. Secondary stem is short and 5 mm. long. Leaves are fleshy and 1.5 cm. long, apex is obtuse and ciliated edges, the base is rounded and sessile. Inflorescence is fasciculate from the axial of the leaf. Flowers are successive and fleshy, 7 mm. long, brown, covered with white, short hairs. Brown sepal; dorsal sepal is adnate to the lateral sepal from the base to one third of its length; dorsal sepal is 6 mm. long and lateral sepal is 7 mm. Petals are white with red nerves, 4.5 mm. long, acute and with 3 nerves. Lip is fleshy, 2.2 mm. long, white; apex is warty and obtuse. Column is white, 2.5 mm. long, stretched with a thick foot, 1.5 mm. long.

Habitat: Epiphyte; moist forests 400 – 1300 m.

Flowering season: June, September, October.

Observations: Looks like a *Pleurothallis*, curious plant that grows with leaves laying flat on the bark, making it inconspicuous, require humidity but not much, difficult to transplant successfully. The flower does not open very widely but is not

cleistogamous as we do not see capsule formation outside its normal habitat.

Dressleria dilecta

(Reichembach) 1866

■ **Description:** Pseudobulbs are 10 cm. long. Leaves are 40 cm. long with three prominent nerves and a conduplicate petiole. Lateral inflorescence of the pseudobulbs with a cluster to 12 to 20 flowers and a 15 cm. long peduncle. Flowers have a pleasant scent; petals and sepals are light yellow. Lip is translucent with an orange cavity and red spots. Sepal is fleshy, carinate, 17 mm, underside is subrugose. Petals are fleshy, 15 mm. long; column is short and completely adnate on the lip's base.

Habitat: Epiphyte; in cloud forest, 1000-1500 m.

Flowering season: June

Observations: We have seen this species only in cultivation at the Lankester gardens in Costa Rica

Dressleria eburnea

(Rolfe) Dodson 1975

■ **Description:** Slightly compressed pseudobulbs, 10 cm. long with 5 or 6 green leaves that are up to 35 cm. long with a long and conduplicate petiole. Lateral Inflorescence with 8 flowers, peduncle is 8 cm. long to the first flower, surrounded by 3 inflated sheaths. Flowers are fleshy, patent, and white with an orange-yellowish cavity on the lip, red spots; lip on top of the flower. Lip is fleshy, 19 mm. long with a subquadrate cavity whose interior is covered with long papilla, lip is adnate for half of the column. Column is 1 cm. long

Habitat: Epiphyte on wet mountains.

Flowering season: September.

Observations: This species is distinguished by its lip that is adnate, for half the length of the column and by the lateral sides that are thicken in the lip. We are waiting to see the flowers of a plant that does not correspond to any of the above long, descriptions taken from Hamer (1982, 2001) being bigger with more abundant leaves, 12 per pseudobulb, 70 cm. coming from Matagalpa purchased roadside without specific locality information.

Dressleria helleri

Dodson 1975

■ **Description:** Pseudobulbs are 8 to 12 cm. long; leaves are green plicate and peciolate, 20 to 30 cm. long. Inflorescence is erect and in cluster from the base of the pseudobulbs, 20 to 25 cm. long, covered by several imbricate sheaths at the base; Inflorescence with 5 to 12 flowers. Flowers are ivory; dorsal sepal is fleshy, 20 mm. long; and lateral sepal is 20 mm. long, apiculate. Petals are fleshy, 18 mm. long. Lip is sacciform, 17 mm. long, very fleshy with a rounded cavity on the thin edge, elevated and erose; the interior cavity is orange with red spots. Column is short, 7 mm. long, adnate to the lip for the entire length.

Habitat: Epiphyte; in wet montane forest.

Flowering season: June

Observations: This species very similar to *D. suavis*, but it is distinguished by the smaller cavity on the lip which has a thin erect edge instead of a thick callus. The only plant we suspect was this was purchased on the side of the road in Matagalpa without exact origin. Unfortunately, the bulb came without roots and never recovered.

Dryadella guatemalensis

(Schlechter) Luer 1978

■ **Description:** Up to 60 mm. tall. flexible stem, bulbous at the base. Leaves are dictic, articulate with sheaths, up to 8 cm. long. Inflorescence is abbreviated, paucifloral, cluster to the apex of the stem. Flowers are light with many dark spots on sepals; petals and lip. Sepal is concave, apiculate, 11 mm. long. Petals with a sulcate central nerve, 11 mm. long, attenuated towards the base. Lip is apiculate, 11 mm. long; disc with a tubercular callus on the nail; column is 6 mm. long with 2 long wings on the apex.

Habitat: Epiphyte; grows on lowlands near oceans or rivers, in humid climate in dense vegetation with ferns.

Flowering season: August to November

Observations: This species was recently found on the San Juan River (Diaz 2008).

Dryadella simula

(Reichembach) 1977

■ **Description:** up to 60 mm. tall. flexible stem, bulbous at the base. Leaves are dictic, articulate with sheaths, up to 8 cm. long. Inflorescence is abbreviated, paucifloral, cluster to the apex of the stem. Flowers are pink-violet with a white callus. Sepal is concave, apiculate, 11 mm. long. Petals with a sulcate central nerve, 11 mm. long, attenuated towards the base. Lip is apiculate, 11 mm. long; disc with a tubercular callus on the nail; column is 6 mm. long with 2 long wings on the apex.

Habitat: Epiphyte; grows on lowlands near oceans or rivers, in humid climate in dense vegetation with ferns.

Flowering season: August to November

Observations: We have not seen this species; information from Hamer (2001)

Echinosepala uncinata

(Fawc.) Pridgeon & Chase 2002

■ **Description:** Up to 45 cm. tall. Secondary stem is up to 13 cm., covered with 3 scarious sheaths, inflated. Leaves are up to 25 cm., including the short and conduplicate petiole. Unifloral inflorescence, covered by a 1.5 cm. spathe, peduncle is finely pubescent, up to 2 cm. Flowers are successive, with yellow petals and sepals, nerves and lip are brown, and the column is white with red patches. Floral bract is inflated, up to 1 cm.; sepals are carinate; dorsal sepal is 12 to 18 mm., the base is concave, convex apex with five nerves; lateral sepals with

six nerves, connate up to near the apex, 13 to 15 mm. Petals with a fleshy base, 7 to 9 mm., acute. Lip is 6 to 7 mm., with two lateral teeth that are curved underneath the middle, with a wide base and two auricles on the sides of the base; apical portion is 4 mm., with transverse apical lobe; basal portion with a wide elevated thickening, lateral carinae extend from the base of the lateral lobes to the sinus of the intermediate lobe. Column is thin, arched, 6 mm., nailed, apically winged portion, pubescent.

Habitat: Epiphyte; in cloud forest, 800-1200 m.

Flowering season: July to November.

Observations: Not common, forms big solitary plants on trunks.

Echinosepala lappiformis

(A. Heller & L.O. Williams)

■ **Description:** To 15 cm. tall. Secondary stem is 2 to 8 mm. Leaf is erect, with a 1.2 to 2 petiole, retuse apex and with a short apiculate on the sinus. Unifloral Inflorescence, from the axils of the secondary stem. Flowers are wine-red. Floral bract is wide, 4 to 6 mm. Sepals verrucose outside, covered with papillose hairs; dorsal sepal is triangular and acute; lateral sepals are connate between them and the base of the dorsal sepal, with an obtuse apex. Petals with verrucose transverse carinae. Lip with erect round lateral lobes; intermediate lobe is 5 mm; disc is glabrous at the base, the rest is verrucose with an oblong callus along the base of each side. Column is 5 mm., arched, with a wide 4 mm. foot.

Habitat: Epiphyte, in cloud forest.

Flowering season: July.

Observations: We have not seen this species; information from Hamer (2001).

Elleanthus alberti

Schlechter 1923

■ **Description:** Up to 60 cm. long, secondary stems are ascendent, simple and covered with tubular sheaths with few apical leaves. Leaves green dorsally, purple ventrally, 8 cm. long, with 5 conspicuous nerves. Inflorescence is apical, erect, dense elongate 15 cm. cluster with up to 50 flowers. Flowers are red-orange with yellow. Dorsal sepal is 4 mm. long, apiculate with 5 nerves; lateral sepals are thick, carinate up to the verrucose apex, 5 mm. long. Petals are yellow with red-orange edges. Column is short and rigid, 3 mm. long.

Habitat: Epiphyte; grows on wet mountains.

Flowering season: July-November

Observations: Very similar to *E. curtii*, which we have not seen, and *E. discolor*, it is distinguished from the latter by the color of its flower (white in *E. discolor*), but curiously when the bud is red looks the same as *E. alberti* until the white petals grow. According to Hamer (1982) it differs from *E. curtii* in the shape of the flower, lip less acute, and sepals are furfuraceous.

Elleanthus aurantiacus

(Lindley) 1863

■ **Description:** up to 30 cm. long; rigid branched secondary stems, covered with brown foliar sheaths. 3 to 5 leaves on the apical portion with a carinate central nerve. Inflorescence is 2.5 cm. long, laxi floral with 4 flowers. Flowers are dictic; sepals are pink-orange to pink-whitish with an apical green carina. Petals are orange or pink with a white nerve. Lip is orange or pink, 5.5 mm. long with a widely truncate apex. Column is 4 mm. long, erect with a foot and two long teeth acuminate at front.

Habitat: Terrestrial; grows on rocks and trunks of isolated trees in places exposed to the wind, 1000 m. edge of dwarf cloud forest.

Flowering season: May

Observations: Very similar to *E. tonduzii*, distinguished by the absence of two longitudinal and one transverse calli at the base of the lip.

Elleanthus caricoides

Nash 1907

■ **Description:** Up to 40 cm. long; secondary stems, green with brown-red spots, covered with maculated sheaths with approximately 5 leaves. Leaves up to 9 cm. long, acuminate. Inflorescence is apical, cluster with 5 to 6 white flowers with yellow crest; bracts are so long that they hide the flower. Petals are 8 mm. with toothed apex. Lip is bell-shaped surrounding the column, truncate apex with erose edge; disc with two basal, papillose calli and in front of them two elevated calli. Column is 6 mm. long with 5 teeth on the apex.

Habitat: Epiphyte; grows on very wet and cloudforest, especially in the canopy.

Flowering season: November to January

Observations: Not very common, difficult to distinguish from *E. tonduzii* when not in flower, but the large bracts permit differentiation for some time after flowering.

Elleanthus cynarocephalus

(Reichembach) 1856

■ **Description:** Thick roots, stems are to 120 mm. long, covered with foliar sheaths on the anterior portion, naked at the base, green with purple spots. Leaves are articulate with sheaths, long, acuminate, distic, alternating, 16 cm. long, longitudinal nerves are prominent, especially on the underside, green. Inflorescence is multi-floral with 40 to 50 pink-violet flowers. Flowers are compact, tightly packed rosette with pedicel ovaries, 12 m long. Sepals are pink-violet, 9 mm. long; petals have the same color as sepals, 9 mm. long, linear and obtuse. Lip is 12 m long, covers the column, wide and the apex that has erous-ciliated, pink-violet margins with two white calli at the base. Column is 7 mm. long, white with violet edges, dilated at the apex, a nose-shaped callus on the inside with a dark-brown anthers.

Habitat: Epiphyte, sometimes terrestrial on fallen trees in open fields; grows in cloud forest at 1000 m.

Flowering season: May to September

Observations: Common, but easily confused with *Sobralia*-generally the old inflorescences permit identification. Stems more woody than *Sobralia*. Flower buds are surrounded by a gelatinous mass.

Elleanthus discolor

(Reichembach & Wascewicz) 1854

■ **Description:** Simple, not branched, up to 40 cm. tall. Secondary stems are thick and covered with red-purple maculated sheaths. Leaves are apical and 3 to 5 cm. long; its longest leaves can be 16 cm. long, elliptic, slightly acuminate, the underside is purple. Inflorescence with up to 30 flowers with an 8 mm. long peduncle. White flowers with red-orange to brown-red bracts. Dorsal sepal is 4 to 5 mm. long with 5 nerves; lateral sepal is carinado, 5 to 5.5 mm. long. Petals are 4 to 5 mm. long, translucent white. Lip is panduriform with an orbicular sacciform basal portion, 5.5 mm. long, erose edges and curved in natural position. Column is 4 to 5 mm. long with a rounded carina, warty in its frontal part and apex with 5 teeth.

Habitat: Terrestrial in cloud forest.

Flowering season: June.

Observations: Rare, very similar to *E. allenii* until the flowers open; incipient Inflorescence is red, resembling *E. allenii*.

Elleanthus hymenophorus

(Reichembach) 1852

■ **Description:** Cespitose, up to 90 cm. tall. Stems are erect, simple and rigid, covered with green furfuraceous sheaths. Leaves are present only on the superior portions, 5 to 12 cm. long, with 7 to 9 nerves, very variable. Inflorescence cylindrical, densely multifloral. Flowers are red-orange with orange sepal and petal apex and the floral bracts; yellow lip with red-brown edges. Dorsal sepal is 5 to 6 mm. long; lateral sepal is 6 mm. long. Petals are 6 mm. long, thin, linear and with 3 nerves. Lip with erose-toothed edges and sacciform base, 6 mm. long; disc with 2 big, 2 mm. long calli partially covered with a thin membrane. Column is 5 mm. long, thickened towards the stigma.

Habitat: Epiphyte and terrestrial; grows in montane and lowland rain forest.

Flowering season: May to July.

Observations: We have seen it on Mombacho Volcano and specimens from the San Juan River at the national herbarium; the plant looks like *Sobralia bradeorum* and a *E. cynarosepalum* is differentiated when in flower.

Elleanthus poiiformis

Schlechter 1923

■ **Description:** Up to 11 cm. tall. filiform stems, less than 0.5 mm. in diameter. Leaves are green, located in the apical position, acuminate with fleshy edges, 20 mm. long with 3 carina on the inside. Inflorescence with up to three successive flowers. Flowers are white with 7 mm. long bracts, furfuraceous with

translucent edges. Sepals are concave, acute, 2.8 mm. long; petals are spatulate with serrate edges and rounded apex, 3 mm. long. Lip surrounds the column with sacciform base; disc with two oblong calli on the basal portion. Column is 2 mm. long.

Habitat: Epiphyte; in cloud forests and rocks near water.

Flowering season: May.

Observations: Smallest of the *Elleanthus*, not very showy, easy to recognize by its size and few white flowers.

Elleanthus tonduzii

Schlechter 1910

■ **Description:** Clustered, to 40 cm. tall, sometimes with roots on the nodes; stems are greenish to purple, partially covered with tight maculate sheaths. Leaves on the apical portion, up to 7 cm. long, papery texture. Inflorescence in cluster, loosely multifloral with flexible, furfuraceous rachis. Peduncle is almost obsolete from a 3 mm. long bract. Flowers are relatively big for the genus, scarlet red. Floral bracts are ovate-lanceolate, lower ones are longer, upper ones are shorter than the flowers. Sepals are membranous, dorsal sepal is acute, 9 mm. long; lateral sepals are oblique deeply concave at the base, 8 mm. long with a carinate nerve ending in an acute and fleshy apex. Petals are thinner and slightly wider on the apical portion with serrate apical edges, 7 mm. long. Lip with slightly erose, fimbriate, and reflexed edges, 9 mm. long; disc with two elliptical calli at the base, 2 mm. long and a 4 mm. long transverse callus immediately above the lip; lip is deeply sacciform in front of this callus. Column is thin, nailed, 7 mm. long and slightly winged.

Habitat: Epiphyte; in tree trunks and on moss, cloud forest above 1000 m.

Flowering season: May.

Observations: Mombacho, Jitotepe highlands. In our experience, these have great difficulty adapting to warmer weather and die slowly out of its natural habitat, like exposed windy outcrops.

Elleanthus wercklei

Schlechter 1923

■ **Description:** Erect, up to 30 cm. tall with abbreviated rhizome, filiform, smooth, flexible roots. Stem is 1.5 to 2 mm. long with few sheaths and 3 to 5 erect, patent, glabrous apical leaves with 3 teeth, 4.5 to 7 cm. long. Inflorescence is erect, distic, dense, with 5 to 10 flowers. Floral bracts are erect and patent, acuminate and concave, rough surface. Flowers are erect and patent; sepals are shortly acuminate with three nerves, 5 mm. long; oblique lateral sepals. Petals are joint, 5 mm. long; lip is 5 mm. with serrate edges and two separated oblong calli at the base covered with a semi-lunate membrane. Column is glabrous with dilated apex, 2.25 mm. long.

Habitat: Terrestrial.

Flowering season: November and December.

Observations: We have not seen this species; information from Hamer (2001).

Encyclia alata

(Bateman) 1840

■ **Description:** Robust, up to 1 m with glabrous pseudobulbs, broadly conical up to 7 cm. long, generally with 3 leaves. Leaves are 35 cm. long, coriaceous, green. Inflorescence is longer than the leaves, up to 1 m long, including the peduncle, rough and covered with scaly sheaths, 4 mm. long. Flowers are patent; petals and sepals are dark brown with a greenish nail. Lateral lobes from the lip are yellowish with darker edges, intermediate lobe is cream-yellowish with orange edges and purple stripes; purple spots on the column and the base of the lateral lobes. Sepals with twisted edges, 32 mm. Petals are sub-acute with a linear nail, 32 mm. long. Adnate lip near the base of the column, 25 mm. long from the base to the isthmus with a fleshy callus, 10 mm. long, surcate and with an apex of three teeth, with a 3 mm. long intermediate tooth. Column is 10 mm. long, reflexed, with two 2 mm. long squared wings near the apex.

Habitat: Epiphyte; in pine forest, on rocks, and low, wet forests up to 900 m.

Flowering season: May to July

Observations: Commonly has the biggest pseudo-bulbs among the Nicaragua species. Grows both in moist places and hot exposed rocks.

Encyclia amanda

(Ames) 1971

■ **Description:** Small pseudobulbs, up to 2 cm. long, which are covered with long scaly sheaths. Leaves are ligulate and coriaceous, 10 cm. long. Peduncle with Inflorescence, 10 to 15 mm. long with 2 to 4 flowers. Sepals are 13 cm. long; oblique lateral sepals. Petals are 12 cm. long, spatulate and sub-obtuse. Lip is almost free, 12 cm. long; lateral lobes are tight against the side of the column, not reflexed, obtuse, separated from the intermediate lobe by a short isthmus. Column is 7 mm. long with 2 sub-squared wings, conspicuous and laterally reflexed on the apical portion.

Habitat: Epiphyte in cloud forest above 1200 m.

Flowering season: January and February.

Observations: Not common, we have seen one specimen only, from the Matagalpa to Jinotega road. If it is not flowering, the plant is very similar to *E. gravida*, but with longer inflorescence.

Encyclia ambigua

(Lindler) 1853

■ **Description:** Old pseudobulbs rough, wrinkled, new pseudobulbs glabrous, up to 5 cm. long. Leaves are coriaceous with an obliquely bifid apex. Inflorescence is erect, 60 cm. long, including the 25 cm. long, including the peduncle which is covered with 5 glabrous sheaths, 4 to 10 mm. long; peduncle, rachis and ovary, have short violet stripes and a verrucose surface. Sepals are acute, 23 mm. long with 7 nerves; dorsal sepal is lanceolate, lateral sepals are obliquely lanceolate. Petals are spatulate, acute, with 7 nerves and a thin nail, 22

mm. long. Lateral lobes are patent, 10 mm. long, with slightly elevated nerves, adnate in the proximal half of the column; disc of the middle lobe with papillose radiating nerves; elliptic callus with 3 keels on each side then join near the apex of the callus and continue as carina to halfway up the lip. Column is 9 mm. long. Arched, with two acute rounded auricles on each side near the apex.

Habitat: Epiphyte; in pine and oak forest around 1300 m.

Flowering season: May to July.

Observations: Not very common, we have seen it mainly near the top of Tisey.

Encyclia belizensis

(Reichembach) 1850

■ **Description:** Erect, up to 60 cm. tall. Pseudobulbs are cylindrical-fusiform, slightly compressed, leaves bifoliate, up to 30 cm. tall, partially surrounded by brown scaly sheaths up to 12 cm. long. Leaves are acute, up to 20 cm. long. Inflorescence is terminal with 2 fragrant flowers growing out of the 5 mm. long base; strong peduncle, compressed, 2 cm. long. Flowers are ivory white with violet stripes, patent. Small floral bracts, 3 mm. long. Sepal is acute with twisted edges; dorsal sepal is linear-lanceolate, 3.5 cm. long; lateral sepal is oblique, elliptic-lanceolate, 3.8 cm. long. Petals are acute, 3.5 cm. long; lip is adnate to half of the column; auriculate at the base, deeply concave; disc with purple nerves and a slightly elevated callus thickening slightly moving away from the base, and ends in four teeth or lobes. Column is short, 8 mm. long, with three lobes on the apex and a bifid, erect tooth on the back lobule.

Habitat: Epiphyte; grows in rainforest

Flowering season: January

Observations: We have not seen this species, information from Hamer (2001).

Encyclia ceratistes

(Lindler) 1844

■ **Description:** Large, up to 1 m tall with 6 cm. tall pseudobulbs covered with scaly sheaths with 1 to 4 leaves. Leaves are up to 30 cm. long, coriaceous, dorsally carinate. Inflorescence is terminal, paniculate, up to 1 m. long, including peduncle, maculated, with several tight 1 mm. long sheaths. Flowers are small; sepal and petals are creamy-yellow with brown-red spots; lip with red lateral lobes and yellow apex, intermediate lobe is light yellow with carmine stripes on the apical portion. Petals are spatulate, 11 mm. long. Lip has three lobes, adnate to the base of the column, 11 mm. long; lateral lobes are 6 mm. long, attenuated to the apices, mid-lobe is acute, lateral lobes, 6 mm. long; apical portion is erect and not patent; disc with a surcate callus that extends for half of the intermediate lobe and continues with 3 linear nerves, elevated to the apex of the lip. Column is 6 mm. long with 2 curved teeth on the apical portion.

Habitat: Epiphyte; grows in moist evergreen forests.

Flowering season: May.

Observations: We have not seen this species in Nicaragua, the illustration is of a Guatemalan specimen in cultivation in Costa-Rica.

Encyclia chiapasensis

Withner and Hunt 1994

■ **Description:** 5 mm. long compressed green pseudobulbs, bifoliate, when young, the pseudobulbs are covered with scaly sheaths which drop off eventually. Apical leaves are 25 cm. long, conduplicate at the base, green. Terminal paniculate inflorescence. Peduncle is 30 cm. long, purple with small pale green bumps. Flowers are brown-purple with pale purple lip. Sepal is 15 mm. long, dark purple to brown-purple with green, thickened apex. Petals are 14 mm. long, same color as sepals. Lip is enveloped with the base of the column, with 3 lobes; reflexed lateral lobes, surrounding the column, green-yellowish, wavy, apiculate, whitish background. Disc at the base of an elevated callus made up of four elevated nerves that open and close leaving between it an elevated, thickened surcate ovule, which ends in a central nerve toward the apex; disc is white with greenish base. Column is 7 mm. long, dilated to the apex and with two arms almost square and wide. It has a 4 mm. long capsule finely warty.

Habitat: Epiphyte; in dry forested hills.

Flowering season: March and April.

Observations: We have found it in Nueva Segovia; earlier workers classified it with *E. dickensoniana* which we have not seen in Nicaragua.

Encyclia cordigera

(HBK) Dressler. 1964

■ **Description:** 7 cm. tall pseudobulbs, bifoliate, when young they are covered with scaly sheaths. Leaves are green, coriaceous, conduplicate at the base, 35 cm. long. Inflorescence on a stalk with up to 10 flowers. Flowers are very showy, white, purple with pink or pale purple lip; in the early morning the flowers are pleasantly fragrant. Sepals are 35 mm. long, reflexed, green with wide, purple nerves, apiculate apex and greenish. Petals are 35 mm. long, wavy edges, colored as the sepals. Lip has three lobes, 4.5 cm. long, lateral lobes are reflexed surrounding the column; middle lobe is rounded, with a conspicuous pinkish white margin, the apex, pink-whitish to purple with purple stripes along the intermediate lobe. Disc with a 10 mm. long callus covered with purple stripes. Column is 16 mm. long, triangular, green-whitish with purple spots.

Habitat: Epiphyte; in dry areas at approximately 100 to 900 m. above sea level.

Flowering season: February to May

Observations: Previously common in Carazo, but has become scarcer due to degradation of the habitat and human predation. The pink form also exists in Nicaragua, but in drier forests. Our inclination is to treat them as separate species because the populations do not mix, The pink form is found in drier, hotter climate, the pink form produces very large robust plants where the white form produces only medium sized plants, and the

pink form does not change flower color when moved to the same conditions as the white one.

Encyclia diota

Lindley 1843

■ **Description:** Robust, up to 50 cm. tall. Pseudobulbs are ovate, piriform, 5 cm. long, covered with scaly sheaths. Leaves are 25 cm. long, conduplicate at the base, coriaceous, generally purple on the underside. Inflorescence is 70 cm. long, paniculate, branched and multi flowered. Peduncle is olive green with cream 1 cm. sheaths. Flowers olive brown to chocolate sepals and petals. Lip is dark yellow with carinate veins, orange anthers. Floral bract is 3 mm. long. Sepals are elliptic, acute, dorsally carinate, thickened at the apex, slightly concave, with 5 main nerves, with involute edges. Petals spatulate, sub-acute, 13 mm. long. Lip has 3 lobes near the base, adnate to the column, dorsally carinate, 14 mm. long; lateral lobes are 8 mm. long with obtuse apex, occasionally bifid with the basal half surrounding the column and the apical half is patent; intermediate lobe is 7 mm. long, apiculate and with curved edges. Column without teeth or wings.

Habitat: Epiphyte; in dry mountains, 400 to 1000 m. above sea level.

Flowering season: March to May.

Observations: Locally common around Estelí in dry forest trunks and gallery forest along rivers.

Encyclia gravida

Lindler 1849

■ **Description:** Piriform pseudobulbs, 2 cm. long, covered with long scaly acute sheaths covering the bifoliate pseudobulbs. Leaves are green, thin 13 to 20 mm. long 1 cm. wide, coriaceous, ligulate, attenuated at both ends. Peduncle with 10 to 15 cm. inflorescence. Flowers are yellow; lip has more intense color. Sepals are 16 mm. long, patent and thickening to the apex; petals are 15 cm. long, acute with 5 nerves at the base. Lip, three lobed, with lateral lobes enveloping the column; lateral lobes are 8 mm. long, obtuse and separated from the intermediate lobe by a short isthmus; mid-lobe is 8 mm. long with whole edges. Column is free, on both sides and with 3 teeth on the apex.

Habitat: Epiphyte; primarily Pacific dry forest 100 to 300 m., uncommon in oak and pine forest.

Flowering season: March to May.

Observations: The most common of the *Encyclias* in dry forest. Amazingly, in almost all forests we found only one species of *Encyclia*, rarely two, where half a dozen would seem to be equally adapted. According to Dressler (pers. com.) the type is from Mexico and this species merits a different name.

Encyclia guatemalensis

(Klotzsch) Dressler & Pollard 1971

■ **Description:** Robust, up to 70 cm. with glabrous pseudobulbs, broadly conical up to 5 cm. long, generally with two or three leaves. Leaves are 25 cm. long, coriaceous, green. Inflores-

cence is longer than the leaves, up to 1 m long, including the peduncle, rough and covered with scaly sheaths, 4 mm. long. Flowers are patent; petals and sepals are greenish brown with six subtle reddish nerves. Lateral lobes from the lip are white, intermediate lobe is white with irregular short purple stripes near the center, adnate lip near the base of the column, 25 mm. with wavy edges. Column is 10 m. long, reflexed, with two 2 mm. long squared wings near the apex

Habitat: Epiphyte; in premontane forest.

Flowering season: May to July

Observations: This species is described from Mexico and reported for Nicaragua on ever, we have not seen Nicaraguan specimens.

Encyclia mooreana

(Rolfe) 1891

■ **Description:** Up to 2 m, including inflorescence. Pseudobulbs are surcate, 6 cm. long, with three leaves. Leaves are coriaceous, up to 25 cm. long, attenuated to the obtuse apex and obliquely retuse. Inflorescence up to 2 m long, paniculate and branched, each branch has up to 14 flowers. Peduncle white, 7 mm. diameter near the base with tight sheaths; branches, rachis and ovary and pedicel verrucose. Sepals and petals are olive green with purple spots; lip is violet with white edges; column is red, anthers, orange. Floral bracts are acuminate, 4 mm. long, warty. Sepals are concave, arched, acute, 1.3 cm. long; lateral sepals are oblique. Petals are spatulate, acute and concave, 1.1 cm. long. Lip has 3 adnate lobes near the base of the column, 1.1 cm. long, flattened; lateral lobes are 7 mm. long, when flattened on they cover half of the midlobe which is slightly obtuse. Column is thin, almost erect, with a small triangular tooth on each apical side

Habitat: Epiphyte in low, humid mountains.

Flowering season: May

Observations: We have seen this species only in Costa Rican collections and one possible specimen from Carazo but have not seen the flower on that one.

Encyclia papillosa

(Batem.) Ag. & Chavarieta 1987

■ **Description:** Ovate pseudobulbs, 3 cm. long, covered with long sheaths. Leaves are linear, acuminate, coriaceous, sometimes reddish, conduplicate at the base, 25 cm. long. Inflorescence is 30 cm. long, paniculate, branched; peduncle and rachis are papillose and reddish. Flowers are green-yellowish with red veins; lip is cream with three short violet stripes on the center of the intermediate lobe. Floral bract is short and tight; sepal is lanceolate, 20 mm. long with a warty, erose, and apiculate apex. Lip has 3 lobes, 15 cm. long, lateral lobes with rounded apex, obliquely patent, just surrounding the column; intermediate lobe is wavy with retuse apex; disc with an intermediate lobe and two radiant nerves. Column is thick with three teeth on the apex; lateral teeth are longer than the intermediate tooth with two truncate wings on the apical portion.

Habitat: Epiphyte; grows in dry forest and open, arid and hot fields.

Flowering season: April and May

Observations: This species is locally common on lava flows near the base of Masaya Volcano.

Encyclia selligera

(Lindley) 1914

■ **Description:** up to 60 cm. tall. Pseudobulbs are bifoliate, covered with rigid white sheaths. Leaves are sessile conduplicate at the base, sub-acute, 25 cm., dorsally carinate. Inflorescence is paniculate with approximately 10 to 15 flowers; peduncle and rachis are olive green with small white bumps. Floral bract is acute, 3 mm. long; sepals and petals with a green nail and brown sheaths with red-violet nerves. Sepals are acute, 2 cm. long.; dorsal sepal with an acute nail; lateral sepals with a wide nail. Petals are spatulate with an acute and linear nail, 2 cm. long. Lip is 18 mm. long, pale violet, with red-violet nerves, three lobes: lateral lobes are ligulate and straight in natural position. Column without arms or wings, 10 mm. long, with three teeth on the apex, dorsally carinate.

Habitat: Epiphyte; in pine and oak forest in humid climate.

Flowering season: February to April.

Observations: We have only seen it in cultivation; information from Hamer (2001).

Encyclia suaveolens

Dressler 1971

■ **Description:** Robust, up to 60 cm. with glabrous pseudobulbs, broadly conical up to 4 cm. long, generally with three leaves. Leaves are 25 cm. long, coriaceous, green. Inflorescence is longer than the leaves, up to 60 cm., including the peduncle, rough and covered with scaly sheaths, 4 mm. long. Flowers are patent; petals and sepals are dark brown with a greenish nail. Lateral lobes from the lip are white with a tinge of pink, intermediate lobe is white with a hint of pink. Sepals with smooth edges, arched forward 4 cm. Petals are sub-acute similarly arched, 4 cm. long. Adnate lip with fleshy column, 25 mm. long from the base. Column is 10 mm. long, reflexed, with two 2 mm. long squared wings near the apex.

Habitat: Epiphyte; in pine forest, on rocks, and low, wet forests up to 900 m.

Flowering season: May to July

Observations: Closely related to *E. cordigera* which it resembles, except it lacks pink spots on the lip. Although reported for Nicaragua we have not seen it.

Encyclia trachycarpa

(Lindley) Schlechter 1918

■ **Description:** Robust, up to 80 cm. with glabrous pseudobulbs, broadly conical up to 5 cm. long, generally with three leaves. Leaves are 30 cm. long, coriaceous, green. Inflorescence is longer than the leaves, up to 80 cm. long, including

the peduncle, rough and covered with scaly sheaths, 4 mm. long. Flowers are patent; petals and sepals are greenish brown with fine purple lines in the basal half. Lateral lobes of the lip are very reduced barely distinct yellowish, intermediate lobe is white yellow around the edges, with five parallel purple stripes running down the middle shorter finer lines merging laterally at 45 degree angle. Adnate lip near the base of the column, 25 mm. long from the base to the isthmus with a fleshy callus, 10 mm. long, surcate and with an apex of 3 teeth, with a 3 mm. long intermediate tooth. Column is 10 mm. long, curved.

Habitat: Epiphyte; reported in Mexico from hot dry coastal plains.

Flowering season: May to July

Observations: Withner (1988) reports that the flowers of this species turn black as they wither. Although reported for Nicaragua we have not seen this species.

Epidendrum acunae

Dressler 1959

■ **Description:** Pendant, up to 2.7m long, generally very branched; branches are short, up to 4 cm. long, with 1 to 4 distic leaves. Leaves are coriaceous to fleshy in the main stem, 10 to 15 cm. long. Inflorescence with one flower at the end of the stem, occasionally a second flower on the axil of the upper leaves. Flowers are grey to brown-greenish, rigid and coriaceous. Floral bract is 1.2 mm. long with a rounded apex. Sepals with reflexed edges forming a tube, carinate to the apex; dorsal sepal is 17 mm. long, lateral sepals, 17 mm. long. Petals are spatulate, 16 mm. long, acute. Lip is adnate over half the column, 13 mm. long, callus at the base, elevated, sulcate, with a nerve elevated from the neck to the apex of the lip. Column is winged on the apex and with two conspicuous 5mm. teeth.

Habitat: Epiphyte; grows near water, at 200 and 1200 m. above sea level

Flowering season: June

Observations: We have seen this species only in cultivation in Costa-Rica.

Epidendrum alabastrilatum

Pollard & Hagsater 1978

■ **Description:** Fleshy roots and very branched stems up to 1 m. Leaves occur in 2 to 4 on the apical portions of the stems, articulate and acute, 4 to 10 cm. long. Apical Inflorescence, arched to pendant, 6 cm. long, raceme, with up to 15 flowers. Flowers are showy with white sepals and petals, slightly purple; lip is white with yellow calli. Dorsal sepal is 16 mm. long; lateral sepals are 17 mm. long, acute ending in a conspicuous keel, 3 mm. long on the underside. Petals are dorsally carinate, acute, with irregular nerves. Lip is sub-quadrate, with 4 lobes; lobes are conspicuously mucronate; disc with longitudinal carinae from the two basal calli to the apex of the lip, the whole lip is 10 mm. long. Column is 10 mm. long, dilated apically.

Habitat: Epiphyte; in cloud forest.

Flowering season: Aerial roots on the nodes that cover several square meters on the forest border. Habit of *E. nubium* very similar, but flower lip is very different.

Epidendrum anceps

Jacq. 1763

■ **Description:** Secondary stems are erect to patent, compressed and surrounded by scarious sheaths, 15 to 20 cm. long, foliar on the apical portion. Leaves are 8 to 15 cm. long, alternate, inside is dark green with purple edges and underside is dark purple. Inflorescence is terminal with a big, purple, compressed sheath; floral scape is 40 cm. long, compressed and paniculate. Sepals are reflexed, coriaceous, purple-greenish, the apex is carinate; dorsal sepal is 7.5 mm. long, lateral sepal is 8 mm. long. Petals are 7 mm. long, reflexed and purple. Lip is fleshy, 5 mm, dark purple, adnate along the column, disc with two big and rounded calli. Column is 5 mm. long, purple.

Habitat: Epiphyte; in moist areas 800-1200 m.

Flowering season: November to February.

Observations: Differs in the umbelliform, terminal inflorescence; plant is similar to *Barkeria*.

Epidendrum angustisegmentum

(L.O. Wms.) Hagsater 1999

■ **Description:** Creeping racemes, generally compressed, erect and spaced stems, covered with sheaths. Leaves are dictic, articulate with sheaths, obtuse and retuse at the apex, coriaceous, 7 to 10 cm. long. Terminal inflorescence, raceme, 5 to 10 spaced flowers, up to 10 cm. long, including the short peduncle. Floral bract is green, dictic and membranous, carinae and acuminate and longer than the pedicel. Ovary, 10 to 15 mm. long. Flowers are inconspicuous, green up to pale green, coriaceous. Obtuse sepals and lateral sepals are oblique 7 mm. long. Petals are obtuse and 6.5 mm. long. Lip adnate to the column, obtuse and sometimes retuse at the apex, 5 mm. long. Disc with a pair of elevated calli in the base. Column is short, 2 mm. long, dentate at the apex.

Habitat: Epiphyte; grows in semi dry forest, near shaded rivers, dense swamps.

Flowering season: May to September

Observations: Very common in open habitat, canopy, trunks, easy to plant. Even though it is creeping, it can grow pendant, resistant to sunlight and drought.

Epidendrum arbuscula

Lindl. 1842

■ **Description:** Thick aerial roots; branched stems up to 1 m with robust secondary stems, covered with sheaths, 2 to 6 leaves. Leaves are articulate in the sheaths, coriaceous, dictic, 10 cm. long, conduplicate at the base. Terminal Inflorescence, multifloral raceme, 5 mm. diameter peduncle. Flowers are pale pink. Sepal is 1.3 cm. long, outside is strongly carinate, especially on the apices. Petals are 15 mm. long. Sepals and petals are green-yellowish. Lip is trilobed, basal portion used to the

apex of the column, 10 cm. long; lateral lobes are big, rounded and curved; intermediate lobe is bilobed; disc has two yellow calli at the base, in its prolongation three elevated calli extend to the middle of the intermediate lobe; lip is pale pink; apex of the lobes between the intermediate lobe is thickened and fleshy. Column is 10 mm. long, dilated at the apex.

Habitat: Epiphyte; in cloud forest and pine forest, 1400 m.

Flowering season: January to March.

Observations: Branched stems are almost identical to those of *E. alabastratum* but the lip of the flower is bigger and more showy on *E. nubium*.

Epidendrum barbeyanum

Krzl. 1894

■ **Description:** 20 cm. tall, abbreviated rhizome and filiform roots, flexible and glabrous. Stems are slightly compressed, with 6 to 7 oblong leaves, obtuse, up to 13 cm. long. Terminal inflorescence, abbreviated, with 5 to 10 flowers. Floral bract is small and acuminate. Flowers are big and patent, green-yellowish. Sepals are patent, to 3 cm. long; lateral sepal is oblique; petals are acute, linear on the basal portion, oblanceolate on the apical portion. Lip is adnate to the apex of the column; with a cordiform base; apex is trilobed with wavy edges, 1.7 cm. long, with two auricles at the base; apical lateral lobes are bigger than the intermediate lobe. Column is straight with the dilated apex, 1.5 cm. long.

Habitat: Epiphyte in premontane forest, from 500 to 1000 m.

Flowering season: October to January, May.

Observations: It grows mainly on remnant forest trees in sunny areas and in the forest canopy.

Epidendrum baumanianum

Schlechter 1920

■ **Description:** Several white basal roots, no lateral roots. Secondary stems are rigid, simple, and erect, up to 1 m tall covered with purple spotted sheaths. Leaves are 3.7 to 11 cm. long, concave, with rounded apex, slightly retuse, rigid, green and with purple spots. Inflorescence with compact raceme, dense flowers, 2 to 3 cm. long, with a peduncle up to 50 cm. long, with 20 to 60 flowers. Floral bract is 4 mm. long; showy flowers, patent, long lived, carmine, yellow callus on the lip. Sepals and petals are thick, rigid, with an elevated nerve; dorsal sepal is 15 mm. long, lateral sepals attenuated to the base, 16 mm. long. Petals with seven nerves, acute with apical edges slightly serrate. Lip is adnate to the apex of the column in the truncate base, 8 mm. long, with irregularly serrate or dentate edges; intermediate lobe is separated from lateral lobes by a 3 mm. wide isthmus; disc with two elevated calli at the base and with a conspicuous keel from the base to the apex of the lip. Column is almost erect, with conspicuous wings especially towards the apex.

Habitat: Epiphyte; in evergreen forest.

Flowering season: December to March.

Observations: Flowers reminiscent of *E. radicans*, but is not a creeping plant, no rhizomes emanate from the stems.

Epidendrum cardiochilum

L.O. Williams 1940

■ **Description:** Creeping rhizome, 15 cm. tall fusiform-thickened stem with the base surrounded by scarious sheaths; apex has 2 to 3 leaves; stem is 5 to 6 cm. long. Leaves are obtuse and reflexed on the apex, dorsally carinate. Terminal Inflorescence from a short peduncle, generally with 3 pedicel flowers. Flowers are creamy-white, old flowers are yellowish with yellow anthers. Floral bract is very small; sepal is acute and acuminate, with 3 nerves, 15 mm. long; lateral sepals are slightly oblique. Petals are acute and uninerved, 13 mm. long. Lip is trilobed; lateral lobes are patent with a rounded apex, approximately 3 mm. long; intermediate lobe is acute and approximately 6 mm. long. Disc with two erect calli in front of the column, short and with nail adnate to the column which is 6 mm. long.

Habitat: Epiphyte; in cloud forest.

Flowering season: December

Observations: We have not seen this species; information from Hamer (1983).

Epidendrum caroli

Schlechter 1923

■ **Description:** Cespitose, sometimes pendant, up to 30 cm. long. Secondary stems are compressed and carinate, gradually dilated to the top surrounded by several 10 mm. long sheaths with a thin base. Leaves are terminal, generally two, acuminate surrounding the stem, 10 cm. long. Inflorescence is short, 3 mm. long with 4 to 5 flowers, thin peduncle, 15 mm. long to the first flower, strongly compressed. Patent flowers; yellow-greenish sepals; lip, petals and column are yellow-pale cream. Floral bract is 2 to 4 cm. long. Sepals and petals are carinate, plain underside; sepals are acute, 6.2 mm. wide; dorsal sepal is 2.1 mm. long, lateral sepal is 2.3 mm. wide; apiculate apex with the exterior slightly verrucose. Petals are acute, uninerved with finely serrate edges, thin texture, 5.5 mm. long. Lip is fleshy with erect sides, finely papillose edges, disc with a fleshy callus elevated and extended from the middle to the apex of the lip where it ends in a big apicule. Column is short, 2.2 mm. long with truncate lateral teeth and a retuse posterior lobe.

Habitat: Epiphyte; in moist mountains.

Flowering season: July and August.

Observations: We have not seen this species; information from Hamer (1983).

Epidendrum centropetalum

Reichembach f. 1852

■ **Description:** Thin, branched, up to 60 cm. tall, with fleshy rugose roots. Stems are very thin, main stem has 2 to 3 mm. diameter, branches 1 to 2 cm. diameter, with 3 to 6 leaves on the branches' apices, the rest of the stem is covered with whitish and verrucose sheaths. Leaves are acuminate, up to 5 cm.

long, dorsally carinate and articulate with red sheaths, verrucose. Terminal Inflorescence, a short raceme and the end of the branches, 2 to 3 cm. long, with 5 to 10 flowers. Flowers are patent, light purple-pink. Floral bract is lanceolate, acuminate, 3 mm. long, arched pedicel ovary, 7 to 10 mm. long. Sepals are trinerved, conduplicated, fleshy, with verrucose apex, 8 mm. long, dorsally carinate only on the apices; dorsal sepal is oblanceolate, 2.2 mm. wide; lateral sepal is oblique, 2 mm. wide. Petals are falcate, acute, trinerved, with dentate apical edges, 7 mm. Lip is adnate over the middle of the column, deeply trilobed, with finely papillose edges; lateral lobes are horizontal, oblong, obtuse, 3 mm. long; intermediate lobe is deeply bilobed, disc is conspicuously nerved, with a tridentate callus that extends to the base of the intermediate lobe. Column is thin, contracted in the center, with a trilobed apex, dentate lobes.

Habitat: Epiphyte; grows above 1000 m. on the canopy and on isolated trunks with abundant sunlight and wind exposure.

Flowering season: December.

Observations: Flowers are often cleistogamous, rarely open widely.

Epidendrum chloe

Reichembach 1856

■ **Description:** Thin and erect, up to 35 cm. tall. foliar stem sometimes reddish, in its apical portions. Leaves 10 cm. long, patent, acuminate grasslike; racemose inflorescence, 5 cm. long, including the 2 mm. long peduncle, with 3 to 5 flowers. Flowers are patent, green-yellowish to reddish. Floral bract is 9 mm. long. Sepals with acuminate apex, fleshy and apiculate, dorsally carinate, 10 mm. long, with 5 nerves. Petals are uninerved, oblique, acute and with ciliated papillose edges, 9 mm. long. Lip is erose and acute, 5 mm. long; disc is tricarinate at the base, with taller lateral keels, but shorter than the central keel. Column is 5 mm. long, dilated towards the apex, with apical edge wavy and crenulate.

Habitat: Epiphyte in the canopy and upper trunk, grows in cloud forest, 1000-1300 m. above sea level.

Flowering season: November to January.

Observations: Not showy nor common, we have seen it a couple of times on fallen trees, but easy to recognize by its grass-like leaves and stem, but for the same reason easily confused with grass when not in flower.

Epidendrum chlorycorymbos

Schlechter 1923

■ **Description:** Erect, ascendant, patent, descendent or even pendant, with secondary stems that are up to 30 cm. long, slightly compressed, covered with foliar sheaths. Leaves are green, coriaceous to thin or fleshy, dictic, 10 cm. long, obtuse to rounded on the apex and articulate with sheaths. Terminal inflorescence, generally multi flowered, with filiform peduncle, short and a 2.5 to 4 cm. long pedicel ovary. Flowers are 2 to 2.5 cm. diameter, pale green, cream to whitish. Sepals are 15 mm.

long with curved edges; petals are linear filiform to lanceolate and 3 mm. wide on the apical portion. Lip joined to the apex of the column, 10 mm. long, green-yellowish to pale green, very variable in shape, generally with 4 lobes; lateral lobes are round; apical lobes are more or less pronounced, rounded, truncate or inconspicuous to obsolete; at the base there are 2 elevated calli often with a central nerve that is thickened up to the apex. Column is 8 mm. long, dilated at the apex, with dentate to apical edges.

Habitat: Epiphyte in wet forest from 600 to 1300 m.

Flowering season: May to July.

Observations: The most common and the biggest of the *Epidendrum* group with rigid, fleshy leaves that were formerly classified as *Neolehmannia*.

Epidendrum ciliare

Linnaeus 1759

■ **Description:** Pseudobulbs are 30 cm. long, very attenuate towards the base, compressed, light green. Leaves are coriaceous, rigid, 23 cm. long, obtuse, underside is dull green, upperside is shiny green. Terminal inflorescence with 20 cm. raceme, 4 to 10 flowers. Peduncle is dark brown to olive with brown sheaths, 6 cm. long. Flowers are green and white, very showy. Sepals are 6 cm. long, acuminate, with reflexed edges, light green. Petals have the same color as sepals, 5.5 cm. long, acuminate reflexed edges. Lip is adnate up to the apex of the column with falcate, white lateral lobes; lip, dilated towards the apex and curved.

Habitat: Epiphyte; grows from semi-arid areas to cloud forest, 400-1300 m.

Flowering season: November and December.

Observations: Hamer reports it as flowering from April to June but we have not seen it flowering during this period. This is one of the most common and showy of the *Epidendrum*s and it adapts very well to cultivation, the plant without flowers looks like a *Cattleya*, the flower is white with a fringed lip which makes it easy to recognize. This species forms large mats, especially on the first thick branches of big trees in gallery forest. It has a sweet fragrance at night.

Epidendrum cnemidophorum

Lindley 1853

■ **Description:** Thick roots, 50 cm. tall. Robust stem, green, laterally compressed, basal portions with brown sheaths. Leaves are dictic, alternate and articulate with green sheaths, 14 cm. long, attenuated towards the acuminate apex, carinae on the exterior side and conduplicate at the base, enveloping the stem. Terminal Inflorescence in raceme, with three to ten flowers. Peduncle surrounded by three to four green sheaths, conduplicate, 5 to 6 cm. long. Flowers are showy; sepal is 22 mm. long, yellow-greenish with purple spots; petals have the same color, spatulate, 20 mm. long. Lip is adnate to the column, 22 mm. long from the base of the column to the apex of the lip; lateral lobes are white with pink, slightly wavy, 9 mm. long, interme-

diate lobe is bilobed, same color as the lateral lobes, divergent, up to 7 mm.; disc with two prominent white calli at the base and an elevated pink carina from the base to the sinus at the apex of the intermediate lobe. Column is arched, 15 mm. long, light purple.

Habitat: Epiphyte in cloud forest.

Flowering season: December.

Observations: We have not seen this species; information from Hamer (1983).

Epidendrum comayaguense

Ames 1933

■ **Description:** Cespitose and branched, 30 cm. tall. Secondary stems are red-brown, with 2 to 3 apical leaves, covered with white sheaths. Leaves are articulate in their sheaths, patent, up to 6 cm. long. Terminal Inflorescence, descendent with up to 5 flowers, robust peduncle, 2 cm. long. Flowers are big for the plant, patent, dark brown, with green anther. Floral bract is short, 5 mm. long; sepals and petals slightly carinate, 1.7 cm. long, acute to acuminate, dorsal sepal is trinerve, 7 mm. wide, conduplicate at the apex; lateral sepal with 5 nerves, 9 mm. wide, oblique. Petals are acute, 3 mm. wide. Lip is adnate near the apex of the column, edges are finely papillose and dentate, rigid and fleshy, 2 cm. long. Column is thick and robust, 9 mm. long, with auricles that are rhombic at the apex.

Habitat: Epiphyte in the canopy; in humid mountains above 1000 m.

Flowering season: November to December.

Observations: Uncommon, plant is similar to that of *E. alabastrium*, *E. nubium*, but flowers are bigger and more robust. Unlike Hamer reported, we have not seen it flower from March to May.

Epidendrum congestoides

Ames and Schweinfeld 1930

■ **Description:** Densely cespitose, generally very branched. Stems with dense leaf-cover, completely hidden by imbricate sheaths. Leaves are not articulate, dictic, sessile, 1.5 to 3 cm. long, obtuse and retuse on the apex, very fleshy and with hyaline edges; sheaths of the leaves are dilated on the apex. Flowers generally two on the apex of the stem, big for the plant, sessile, erect, green-yellowish with purple patches. Sepals are 10 mm. long, dorsally carinate towards the apex, with dentate carinae on the lateral sepals; lateral sepals are shortly acuminate, 10 mm. long. Petals are obliquely inserted in the column, abruptly apiculate, fleshy slightly wavy on the curved edges, 6 mm. long; disc is thickened in the center. Column is slightly curved, with rounded lateral lobes on the apex.

Habitat: Epiphyte or lithophilic from 10 to 1000 m.

Flowering season: Almost all year.

Observations: Very common in premountane forest at 300-700 m.

Epidendrum coriifolium

Lindley 1851

■ **Description:** 40 cm. tall. Stems compressed, slightly winged, covered with brown sheaths, 10 to 12 mm. wide on the apical portion with 3 leaves. Leaves are green, 7 to 13 cm. long, coriaceous, underside carinate. Terminal inflorescence is 26 cm. long, raceme with approximately 15 flowers. Flowers are green with dark olive bracts, 4 cm. long, carinae, compressed covering the pedicel ovary. Dorsal sepal is 20 mm.; lateral sepal is 20 mm., green, carinae, strengthened apically, dark brown. Petals are 18 mm. long, green, central nerve is olive brown. Lip is adnate to the column, dark green, with brown and olive spots, fleshy, when young it is conduplicate, 16 mm. long, dentate edges with two small calli at the base and a fleshy thickened callus along the lip, rounded apex. Column is 7 mm. long, green with olive brown.

Habitat: Epiphyte; in wet tropical forest.

Flowering season: March to August.

Observations: We have not seen this species; information from Hamer (1983).

Epidendrum criniferum

Reichembach 1871

■ **Description:** Short creeping rhizome, up to 80 cm. tall. Secondary stems are foliate and covered with sheaths. Leaves are green, ascendant, surrounding the stem with their bases, 12 cm. long. Terminal inflorescence, raceme is paucifloral, peduncle is 2 cm. long, covered completely with compressed imbricate sheaths. Flowers with patent sepals and petals, green with dark carmine spots; white lip, apex of the column and anther is pale carmine. Floral bract is 3 to 4 mm. long; sepal is 11 mm. long; filiform petals, acute, 10 mm. long. Lip is adnate to the apex of the column, 12 mm. long; lateral lobes divided by an irregular fringe; intermediate lobe is linear. Disc with a pair of oblong calli at the base. Column is 6 mm. long.

Habitat: Epiphyte; in rain forest.

Flowering season: January

Observations: This species forms very large plants, up to 2m diameter at Los Guatuzos in gallery forest.

Epidendrum cystosum

Ames 1934

■ **Description:** Up to 13 cm. tall, grey patent roots. Stems are generally singular and erect, up to 7 cm. tall, thin, slightly compressed on the top and covered with tight sheaths, generally bifoliate. Leaves, obliquely ascendant, acute, 6 cm. long. Inflorescence is shorter, 3 cm. long, including the 1.5 cm. peduncle. Flowers are semi-patent, successive, pink sepals and white column, cream lip. Floral bract is short, tight, triangular, 2 mm. long. Sepal is trinerved, 7 mm. long, acuminate; dorsal sepal is 2 mm. wide and lateral sepal is 2.6 mm. wide. Petals are filiform, 7 mm. long. Lip is adnate in the lower half of the suborbicular column, 5 mm. long, concave, fleshy and acute. Disc with two elevated carinae from the base to the middle of

the lip, where it fuses in to one carina at the apex of the lip. Column is 4 mm. long with a dentate apex.

Habitat: Epiphyte in low and humid areas.

Flowering season: April.

Observations: We have not seen this species; information from Hamer (2001).

Epidendrum eburneum

Reichembach 1867

■ **Description:** Erect, 20 to 80 cm. tall, compressed stems, covered with scarious and striated sheaths. Leaves on the apical portions, articulate with sheaths, coriaceous, dorsally carinate, up to 11 cm. long. Inflorescence from the axil of the upper leaf, reflexed rachis, with 4 to 6 successive flowers. Patent flowers, ochraceous sepals, green-yellowish petals, white lip with yellow calli. Floral bract is 6 mm. long; sepals and petals with curved edges in natural position. Sepal is 30 mm. long, acute; petals are linear, 27 mm. long. Lip is patent, adnate near the apex of the column, serous edges, cordate base, 27 mm. long; disc with two divergent calli at the base, 6 mm. long. Nailed column, 12 mm. long.

Habitat: Epiphyte; on tree trunks, near water in wet tropical rain forest.

Flowering season: October to January.

Observations: Atlantic zone at low altitude where there is *E. nocturnum*, unlike *E. nocturnum* that has two lateral lobes, this one has a continuous, circular, big lobe formed by the lip.

Epidendrum eustirum

A.H. & S. 1935

■ **Description:** Thin and erect, up to 40 cm. tall. Stems are surrounded by tight sheaths, scarious, 1.5 cm. long. Acuminate leaves, 3 to 4 leaves on the apical portion, short, 8 to 11 cm. long, articulate with sheaths, underside with red-violet spots. Subumbelate inflorescence, 2.5 to 4 mm. long including the purple peduncle, 0.5 to 2 cm. long; has 2 to 8 flowers of which only 1 or 2 are open at the same time; verrucose peduncle and rachis. Patent flowers, greenish petals and sepals, sometimes with brown spots; green-whitish lip with a shiny red callus and the apex of the column. Floral bract is 3 to 8 cm. long, rugose. Sepals are trinerved, 8 to 10 cm. long, dorsally carinate and apiculate, arched basal edges, conduplicate apex; dorsal sepal is 2.5 mm. wide, oblique lateral sepals, 2 mm. wide. Petals are uninerved, 7 mm. long. Lip with an adnate nail half the column; curved edges, wavy, crenulate, with an acute triangular apex, 5 to 6.6 cm. long, including the 1.5 mm. long nail; disc with a big plate-shaped callus, rugose, covering half the disc; lateral edges of the callus are thickened and elevated, especially near the nail and extends to the apex; sulcate central portion. Column is 3 mm. long, arched and trilobed on the apex.

Habitat: Epiphyte in cloud forest

Flowering season: December and January

Observations: We have not seen this species; information from Hamer (1983)

Epidendrum flexuosum

G. Mey 1818

■ **Description:** Up to 80 cm. tall, foliar stem, covered with yellow-greenish sheaths, purple spotted. Leaves are dictic, coriaceous, obtuse, 10 cm. long. Terminal inflorescence, raceme, densely multifloral, with erect and elongated peduncle, covered with several acuminate sheaths. Flowers are pink to dark purple, showy. Dorsal sepal is 11 mm. long, lateral sepals are oblique and 13 mm. long. Petals are acuminate, 11 mm. with crenulate edges. Lip is adnate along the column, patent lamina with orbicular quadrate apex and whole edges. Disc with two falcate calli at the base and central carinae from the base to approximately half of the lip. Column with nail, reflexed, 1 mm. long with a fleshy lobe on each side of the apex

Habitat: Epiphyte; in branches of semi-fallen trees and at low, humid altitudes.

Flowering season: April

Observations: We have found it growing on the same ant colonies a *Coryanthes*, specimens in cultivation languished and did not recover after losing their ants.

Epidendrum fruticosum

Pavon & Lindl. 1853

■ **Description:** Up to 25 cm. to 1 m tall, sometimes pendant and branched. Stems, 3 to 4 mm. diameter, new shoots are covered with white sheaths; when old the sheaths are brown, each stem has 2 to 3 leaves. Leaves are coriaceous, 5 cm. long carinae. Racemose inflorescence, pendant terminal, with purple peduncle, 1.5 cm. long, 4 to 5 flowers. Flowers are fleshy, campanulate; sepals and petals are green reddish to red violet; lip is pale green with a big red-violet callus. Floral bract is 7 mm. long; sepals are concave, acute; dorsal sepal is tri-nerved, 9 mm. long, lateral sepals are oblique, 10 mm. long, with a dorsal keel that is up to 1 mm. tall. Petals are acute, tri-nerved, 7 mm. long. Lip is adnate to the column near the apex, with a widely retuse apex and an apicule on the 6 mm. long sinus. Disc with a long, wide, orbicular and irregular callus in the center, concave in the base near the nail, where the others have two divergent calli with others between them that extend to the apex of the lip

Habitat: Epiphyte; in cloud forest and on dry hills, approximately 1000-1300 m.

Flowering season: October to January

Observations: Uncommon, small plants similar to *E. nubium*, but half the reported size it is not as rare as reported, it just is not showy on trees that also have *E. alabastratum* and/or *E. nubium* very similar and bigger. These are delicate to transplant.

Epidendrum glumarum

Hamer & Garay 1985

■ **Description:** Up to 50 cm. tall, very branched, branches are 5 to 15 cm. long. Leaves are articulated, growing on the apical portions of the plant and branches, 4 to 10 cm. long, rounded

and bifid apex. Terminal inflorescence in plant and branches, 10 to 12 flowers, greenish, fleshy and semi open, with a conspicuous, big and inflated floral bracts, 1 cm. long. Flowers with obtuse sepals, 6 mm. long; obtuse petals, 5 mm. long, whole lip, adnate to the foot of the column; disc with a sub quadrate callus, wide with a carinae central nerve. Column is short, 3 mm. long, very compact.

Habitat: Epiphyte; in humid areas.

Flowering season: December to February.

Observations: Very common in the canopy of the dwarf forest on Mombacho. where its apparently endemic.

Epidendrum hellerianum

Hawkes 1966

■ **Description:** Cespitose, a little pendant, with fleshy roots. Stem is thin and simple, foliose in the upper portion, compressed on top. Leaves are articulate in sheaths, linear and acuminate, 15 cm. long, reflexed edges, dorsally and conspicuously carinate, with carinae ending in a red sheath with the underside glaucous. Inflorescence from the base of the upper leaf, pendant, with solitary flowers, successive; peduncle is covered with compressed and inflated sheaths. Flowers up to 6 cm. wide, patent and pendant, white, however sepals, petals and the upper portion of the ovary can be reddish. Floral bract is 1 mm. long, acute. Linear sepal with revolute edges, 3 cm.; dorsal sepal is 3 mm. wide and lateral sepals are 4 mm. Petals are similar to sepals, 2 mm. wide in the middle and 1 mm. at the base. Lip is trilobed, cordate, with obtuse lateral lobes; intermediate lobe is triangular, acute, up to 16 mm. long, disc with two erect calli at the base that grow as a thickened nerve to the base of the intermediate lobe, central nerve is also elevated from the base to the apex. Column is 1.4 to 1.7 cm. long, nailed with trilobed apex.

Habitat: Epiphyte; grows in areas where moisture is constant and at approximately 600 m. above sea level.

Flowering season: December and January.

Observations: We have not seen this species; information from Hamer (1983).

Epidendrum isomerum

Schlechter 1906

■ **Description:** Pendant, thin stems, generally branched up to 2m long, foliar on the apical portions, covered by membranous sheaths. Leaves are dictic, coriaceous, rigid, linear and acute, 2 to 12 cm. long. Terminal Inflorescence, a solitary flower growing from the apex of the new shoot. Flowers are small and yellowish. Sepals are 11 to 15 mm. long, wide with revolute edges; petals are 11 to 13 mm. long, acute. Lip is adnate to the column, lamina is 8 to 9 mm. long, fleshy, acute, 2 to 2.5 mm. wide; disc with two short calli, inconspicuous in the base and a central carinae from the base to the middle of the lamina.

Habitat: Epiphyte; in cloud forest and plantations with shade and old coffee plants, evergreen forest.

Flowering season: September.

Observations: Pendant, can reach considerable size 2m, not very common, we found it at forest edges near Rama and Boaco growing in branches and small trees, 3-4 m above the ground.

Epidendrum lacustre
Lindley 1855

■ **Description:** Erect, up to 80 cm. tall. Stems are compressed, covered with inflated sheaths. Leaves are numerous and dictic, articulate with sheaths, 10 to 16 cm. long, with rounded and slightly retuse apex. Flowers are patent and showy, big with sepals, green petals and apex, the rest of the lip and column are white. Floral bract is triangular, 3 to 5 mm. long. Lip is cordate, trilobed, very variable in size and shape, 2.2 to 2.5 cm. long; intermediate lobe is acuminate, 1 to 1.6 cm. long; lateral lobes are labriform; disc with bifid, linear callus, 5 mm. long at the base, laterally excavated; divergent apex, central nerve thickens from the base toward the apex. Column is arched, with nail, 2 to 2.5 cm. long.

Habitat: Epiphyte in cloud forest on mountains at approximately 1000 m. or more.

Flowering season: All year.

Observations: On trunks and branches with a thick layer of moss. Only adapts to warm climate if the roots are kept moist and the plant is shaded. Stem including leaves is a little similar to *E.nocturnum* and *E.carpophorum* but leaves are lighter green and it produces more flowers, up to 7 flowers at once.

Epidendrum laucheanum
Rolfe & Bonhof 1892

■ **Description:** Cespitose, up to 40 cm. long. Secondary stem is erect to pendant, compressed, gradually dilated towards the apex, 5 to 15 cm. long, and covered with tight, tubular scarious sheaths. Leaves are acuminate, revolute edges, coriaceous and rigid, up to 12 cm. Terminal Inflorescence, racemose with 5 to 50 flowers, arched to pendant, up to 40 cm. long, including the 10 to 30 cm. peduncle, compressed and covered with carinate sheaths, up to 3 cm. long. Flowers are erect, patent, fleshy, ocreaceous to reddish. Floral bract is very small, 2 mm. long. Outside of sepal is verrucose, slightly concave; dorsal sepal is 8 mm. long and lateral sepal is 7 mm. long with 5 nerves. Petal is 6 mm. long, obtuse. Lip is very fleshy, adnate near the apex of the column, with erect edges, 5 mm. long, common callus, fleshy, from the center to the apex. Column is short, 3 mm. long, with a tooth on each side of the apex.

Habitat: Epiphyte; in cloud forests above 1200 m.

Flowering season: August to October.

Observations: Very local, we have found it on the forest edges at 2 and 4 meters above the ground on main trunks. This species adapts poorly to cultivation in warmer climate.

Epidendrum miserrimum
Reichembach 1855

■ **Description:** Cespitose, up to 10 cm. tall, including the inflorescence. Stem is erect, covered with foliar sheaths. Leaves

are dictic, fleshy, greenish, up to 2 cm. long. Terminal inflorescence, raceme, with compressed rachis. Floral bract is green with red-brown spots, serrate apex, laterally compressed over the pediceled ovary. Flowers are green with red-brown spots. Sepals are 3.5 mm. long; petals are 3.2 mm. long. Adnate lip to the 3 mm. column. weakly lobed, lateral lobes are erect, pale green, rounded; intermediate lobe is fleshy, sub-acuminate. Column is short and compact.

Habitat: Epiphyte; in low altitude rainforest.

Flowering season: unknown

Observations: This species is so small as to escape notice as an *Epidendrum*, forms mosslike mass on trunks.

Epidendrum mixtum
Schlechter 1912

■ **Description:** Secondary stems are erect, rigid and somewhat compressed, 8 to 10 mm. of diameter, covered with brown sheaths, slightly verrucose, on its upper portions it has foliar limbs, very branched. Leaves are green, dictic and coriaceous, rounded, on the 20 mm. long main stem; on the smaller branches, 2 to 3 cm. long. Terminal inflorescences on the branches, raceme with 4 to 5 flowers, 3.5 cm. long. Flowers are whitish, strong fragrance at night; floral bract is inflated and compressed, 10 mm. long. Sepals are 9 mm. long, white with one green carina on the inside. Petals are 8 mm. long, white and acuminate. Lip is adnate to the middle of the column, triangular, cordate at the base, lateral edges are reflexed, acuminate and apiculate on the apex. Disc with an obtuse callus, surcate, ending in an elevated nerve that grows to the middle of the lamina. Column is white, 4 mm. long with 2 wide and elevated lobes on the apex.

Habitat: Epiphyte or terrestrial; on steep slopes.

Flowering season: May to November.

Observations: Not very common and requires a lot of humidity in cultivation.

Epidendrum nocturnum
Jacq 1760

■ **Description:** Secondary stems are up to 50 cm. tall, basal portion terete; apical portion is dilated and compressed; covered with sheaths that have foliar limbs. Leaves are green, articulate with sheaths, dictic, 11 cm. long, coriaceous, obtuse. Inflorescence is terminal, raceme, short and compact, covered with brown sheaths. Flowers grow one after the other, strong fragrance at night, white and yellow, very showy. Sepals are 6.5 cm. long, reflexed edges, largely acuminate, green-whitish to green yellowish. Petals are 6.5 cm. long, same color as the sepals. Lip is joined to the apex of the column, white yellowish; intermediate lobe is 4.5 cm. long; disc with a pair of yellow basal calli. Column is 2 cm. long, dilated towards the apex, white.

Habitat: Epiphyte, sometimes terrestrial, in evergreen forest and in open fields on isolated trees from the Atlantic Coast to 1000 m.

Flowering season: all year

Observations: Finer and longer stems than *E. carpophorum*, flowers open very well, flowers are 20% smaller than *E. carpophorum*. There is considerable variation in the lateral lobes of the lip which may indicate occasional hybridization with *E. eburneum*.

Epidendrum octomerioides

Schlechter 1907

■ **Description:** Up to 30 cm. tall, creeping rhizome with roots on the nodes. Secondary stems are erect, very distanced, thickened and cylindrical, compressed, up to 8 cm. long, covered with scarious sheaths. Leaves are coriaceous, glabrous, up to 10 cm. long, sessile. Inflorescence is abbreviated, 4 to 5 flowers with short pedicel, hidden behind the inflated and scarious sheaths. Flowers are white, patent. Floral bract is inflated, carinae, 1 cm. long, with dentate apex. Sepals with 7 nerves, acute apex, fleshy, conduplicate; dorsal sepal is 10 mm. long and lateral sepal is 9 mm. long. Petals are trinerved, linear and acute, 8 mm. long. Lip is 5.5 mm. long, with cordate base and apiculate apex, finely serous edges; disc with two porrect calli at the base and three elevated nerves from the callus to the apex, with radiant lateral nerves. Column is nailed, 4.5 mm. long, arched, with dentate apex.

Habitat: Epiphyte on trees in open forests and mountains.

Flowering season: November to January.

Observations: Not very common or showy but adapts very well to cultivation.

Epidendrum oerstedii

Reichembach 1852

■ **Description:** Creeping rhizome, up to 30 cm. tall. Pseudobulbs are compressed and surcate, up to 12 cm. long, unifoliate, rarely bifoliate. Leaves are coriaceous, rigid, with rounded and retuse apex, up to 10 cm. long. Terminal inflorescence with new shoots before the pseudobulbs have developed; 3 to 5 flowers, rachis up to 20 mm. long including the compressed, 6 mm. long peduncle, flowers are patent, green with the revolute sepal edges, white lip and yellow callus, white column. Floral bract is carinate, 3 cm. long. Acuminate sepals; dorsal sepal is 5 cm. long, lateral sepal is 4.5 cm. long. Petals are 4.5 mm. long with serous edges. Lip is adnate almost to the apex of the column, 3 cm. long. Complete lateral lip with rounded apices, 1.4 cm. long; intermediate lobe is acuminate, linear basal portion, apical portion is extended, twice the width of the basal portion, 2.8 cm. long. Disc with two divergent calli, an elevated nerve extended along the intermediate lobe. Column is arched, dentate apex, 1.8 cm. long.

Habitat: Epiphyte; or Lithophytic in warm semi-arid climate 600 to 1000 m.

Flowering season: May to June

Observations: The shape of the stem is variable, it can be short and fattened or elongated, similar to *E. ciliare* but easy to differentiate when it flowers because the lip of this species lacks fringes.

Epidendrum pansamalae

Schtr. 1912

■ **Description:** Cespitose, not branched, up to 43 cm. tall, with leaves on the upper portions. Stem is terete, thin, 3.5 mm. diameter, covered with maculate and slightly verrucose sheaths. Leaves are patent, thin, dictic, articulate with 6.5 cm. long sheaths. Peduncle is 1.5 cm. long. Short racemose inflorescence. Flowers are patent, purple except on the apical portion where they are white. Floral bract is acuminate, 6 mm. long, green-purple pedicel ovary, thin, up to 2.5 cm. long. Sepals are 11 mm, dorsally carinate, thickened and apiculate apex. Petals are spatulate, 10 mm. long, with acute and thickened apex. Lip is trilobed, with serrate edges, adnate with the nail at the middle of the column; lateral lobes are obtuse and erect, 3 mm. long, slightly surpassing the 2mm. intermediate lobe; slightly retuse, with a thickening over the sinus, forming a short apicule; lip is 6 mm. long, not including the 2 mm. nail; disc with a sulcate callus, 1 mm. wide, with bifid apex. Column is tubular with thin serrate lobes.

Habitat: Epiphyte in cloud forest.

Flowering season: October.

Observations: With thick, aerial roots that are difficult to loosen without damage, therefore, we have not been able to transplant it successfully. It is not showy when has not flower so it appears rare, but it is very showy during the flowering season and not so rare after all.

Epidendrum paranthicum

Reichembach 1852

■ **Description:** Secondary stems are branched, thin, foliate with roots on the nodes. Leaves are pale green, dictic and articulate with fleshy sheaths, 20 mm. long. Inflorescence with 2-5 flowers peduncle is short and covered with sheaths. Floral bract is almost as long as the pedicel; ovary, concave and compressed. Flowers are small, yellow to green-yellowish, sometimes with purple spots. Sepals are 3 mm. long; petals are 2 to 3 mm. long. Lip size varies, adnate to the column, deeply trilobed; midlobe is acuminate and lateral lobes are rounded at the apex; disc with a fleshy callus on the central portion. Column is short, three lobed at the apex, 1 mm. long.

Habitat: Epiphyte; in moist forest on tree moss, 800-1000 m.

Flowering season: May.

Observations: Can grow to be a big plant with abundant but small inflorescence. This species adapts poorly to cultivation, it is not uncommon in its natural habitat.

Epidendrum parkinsonianum

Hooker 1840

■ **Description:** Up to 2 m; stems are branched, short, curved and unifoliar. Leaves are green and sometimes greenish-purple, fleshy and coriaceous, conduplicate at the base, up to 50 cm. Terminal inflorescence, 1 to 3 flowers. Flowers are big and showy, pleasant fragrance at night, green-white in young flowers and yellow after 10 days, white lip. Sepals are 5 to 7 cm.

long, acuminate with curved edges, inside is green-yellow, underside has purple spots sometimes. Petals are 5 to 7 cm. wide, acuminate and green-yellow. Lip is adnate to the middle of the column; big lateral lobes, obtuse and a little wavy, white; intermediate lobe is acuminate, same color as the lateral lobes. Disc at the base with 2 yellowish calli. Column is 2.2 cm. long, dilated towards the base, white.

Habitat: Epiphyte; in relatively dry, temperate oak forest at approximately 1000 to 1500 m. above sea level. Sometimes lithophilic on cliffs, but leaves are always pendulous.

Flowering season: March and April

Observations: Its fleshy and pendulous leaves are distinctive. Growth is relatively slow and even though it is very resistant to drought, fallen specimens are lost rapidly if the leaves are not hanging.

Epidendrum peperomia

Reichembach f. 1854

■ **Description:** Very small branched, stems covered with brown sheaths. Leaves are dictic, with 3 or more on each stem, green-purple, elliptic, retuse on the apex, 15 to 20 mm. long. Flowers are big for the genus, sessile, solitary on the apex of the stem, pedicel ovary is thin and 2 cm. long. Sepals and petals are pale purple-green; dorsal sepal is obtuse, 12 to 15 mm. long; lateral sepal is oblique, triangular, sub-obtuse to acute, 12 to 15 mm. long. Petals are obliquely linear, 10 to 15 mm. long. Lip is adnate to the column, porrect lamina, brown red with green edges, cordate at the base, retuse, apiculate or truncate on the apex, with ciliated edges, 14 mm. long; disc with a pair of fleshy calli at the base, thickened along the center of the basal portion. Column is green, dilated on the apex, 7 mm. long.

Habitat: Epiphyte on trunks and forks, in coffee plantations, pasture and forests from 400 to 1200 m.

Flowering season: September to January.

Observations: It is creeping on bark, where it can form big plants. Size of the flower can range from 12 to 16 mm. on the same plant depending on weather conditions.

Epidendrum phragmites

Heller & Williams 1968

■ **Description:** Patent and pendant, up to 80 cm. long. Stems are slightly compressed, with leaves in the apical portion, covered with sheaths. Leaves are fleshy and coriaceous, dorsally carinate, obtuse and retuse apex, 4 to 8 cm. long, articulate with sheaths. Inflorescence with one or two flowers from the base of the sheaths of the stem, sub-sessile or with a 3 mm. long peduncle, which is covered with 4 tight and imbricate bracts. Flowers are coriaceous, green-yellowish. Sepals are acute with 5 nerves, lateral sepals are slightly oblique, 12 mm. long. Petals are acute, trinerved, the nerves in the underside are carinae and 11 mm. long. Lip is acute, slightly contracted above the middle; disc with two cavities that extend to the nail, with two longitudinal carinae that cover 75% of the lip, with erect lateral edges, surrounding the column, 10 to 11 cm. long. Column with rostellum on the inferior 40%, fleshy and dentate on the apex.

Habitat: Epiphyte; in wet forest in alpine regions.

Flowering season: February and March.

Observations: We have not seen this species; information from Hamer (1983).

Epidendrum physodes

Reichembach f. 1873

■ **Description:** With abbreviated rhizome and caespitose stems. Secondary stems are patent, up to 10 cm., terete at the base, gradually thickening towards the apices, covered with fleshy sheaths. Leaves are dictic, patent, with reddish nerves and somewhat purple inside, up to 3 cm., surrounding the base and an articulate sheath. Terminal Inflorescence, peduncle to 17 cm., covered with tight sheaths, 1.5 cm. Flowers also appear on old peduncles on dense racemes with 4 to 6 flowers. Flowers are semi-patent, pale ochre with reddish petals and sepals. Floral bracts surround the ovary, acute, 1.5 to 2 cm. Sepals are dorsally carinate, acute, with 5 nerves; dorsal sepal is 5 mm; lateral sepals are obliquely adnate to the base of the column, 6 mm. Petals are uninerved, 5 mm. Lip is fleshy, adnate with the nail of the column, lamina is 3 mm, retuse; disc with 2 divergent calli at the base, with the median nerve thickened towards the base. Column is tubular, 4 mm, truncate and dentate apex; rostellum is obsolete; anther prone at the base of the column.

Habitat: Epiphyte in wet areas.

Flowering season: December.

Observations: We have not seen this species; information from Hamer (2001).

Epidendrum piliferum

Reichembach 1876

■ **Description:** Thick roots. Stems up to 1 m tall, erect, plain, covered with scarious and plain sheaths, when young they are purple with foliar limbs in the apical portions. Leaves are dictic, articulate with sheaths, 18 cm. long. Terminal Inflorescence with panicle, multiflora sheaths, up to 25 flowers each. Flowers: green sepals, underside is purple, acute, 15 mm. long. filiform petals, 15 mm. long, greenish. Lip is fused to the apex of the column, wide over the lateral lobes, 8 mm; lateral lobes are greenish, intermediate lobe is the same color as the laterals. Disc is white with purple spots, 3 elevated calli from the base to the intermediate lobes and two elevated calli at the base. Column is 10 mm. long, white and green at the base with brown anthers.

Habitat: Epiphyte and terrestrial, cloud forest, 1200-1600 m.

Flowering season: November to March.

Observations: Species very similar to *E. scriptum*; the main difference is the lip of the flower with purple on the lip and stems smooth, not warty.

Epidendrum polyanthum

Lindley 1831

■ **Description:** Secondary stems up to 70 cm. tall, erect and patent, compressed, foliar on the upper portions, covered with the leaf sheaths. Leaves up to 14 cm. long, dictic, articulate

with sheaths, coriaceous, dark green. Terminal or lateral inflorescence, pendant raceme, 5 to 10 cm. long, with up to 30 flowers. Flowers are brown-yellowish, white column. Sepals are 10 mm. long, same size as the laterals, brown-yellowish, outside is greenish. Petals are 10 mm. long, pale brown, transparent. Lip is adnate towards the apex of the column; lateral lobes are 5 mm. long, fleshy, brown-yellowish, with thinner edges and whitish; intermediate lobe is 5 mm. long, brown-yellowish; disc with two thickened calli, 3 longitudinal keels, the middle keel is the longest and extends up to the sinus of the intermediate lobe. Column is 8 mm. long, white and dilated at the apex.

Habitat: Epiphyte, occasionally adapting to terrestrial subsistence after falling from the tree, grows in cloud forest, 1000 m. and above.

Flowering season: November, December, April

Observations: The plant is not very distinct but the yellowish-brown inflorescence is easy to recognize

Epidendrum pseudoramosum

Schlechter 1912

■ **Description:** Flexible stems, branched and covered with whitish sheaths that are rugose on the apices, with foliar limbs. Leaves are shiny dark green, 5 to 12 cm. long, articulate with sheaths, obtuse. Inflorescence at the end of the branches, 3 to 5 flowers. Floral bract is very conspicuous, inflated, green-yellowish, 8 to 10 mm. long. Flowers are white-greenish. Sepal is white-greenish, 5 mm. long, obtuse. Petals have the same color as sepals, 5 mm. long. Lip adnate to the column, with an obtuse to round apex, with curved auricles. Disc with a callus at the base, 3 to 5 teeth and a thickened carinae from the base to the apex. Column is white, with 2 wide, lateral auricles on the apex that extend to the middle of the lip.

Habitat: Epiphyte; in cloud forest.

Flowering season: September-November

Observations: Uncommon and local.

Epidendrum radicans

Pavon & Lindley 1831

■ **Description:** Secondary stems are erect, climbing or creeping, more than 1 m long, covered with tubular sheaths, provided with apical foliar limbs, with long aerial roots. Leaves are coriaceous, articulate with sheaths, dictic, 8 cm. long. Inflorescence is terminal 60 cm. long. Flowers are orange and reddish, showy. Sepals are 17 mm. long, one color, red-orange. Petals are 17 mm. long, same color as sepals. Lip is adnate to the apex of the column, free portion is dilated in a trilobed lamina; intermediate lobe is 7 cm. long, lateral lobes are distant and 8 cm. in the center, both with irregular edges; intermediate lobe is emarginate, with dentate, ruffled edges, red-orange and red-yellowish center. Disc, at the base with two small, elevated calli and a central callus that projects from the apex of the intermediate lobe. Column is curved and dilated towards the apex.

Habitat: Terrestrial or on exposed rockfaces exposed to the sun, rarely epiphytic found at 100 to 1500 m., most abundant in rocks and roadside.

Flowering season: All year, but mainly from January to May.

Observations: very common with aerial roots. Cuttings grow and reproduces easily. While exposed to the sun, it reproduces easily, but if it has too much shade it does not bloom. In Mom-bacho Volcano it predominates in a form with yellow-orange petals and sepals, which is rare in other regions where the darker almost red form predominates.

Epidendrum ramosum

Jacq. 1760

■ **Description:** Erect or pendant, up to 50 cm. tall. Stems are flexible, covered with whitish sheaths. Leaves are retuse and obtuse at the apex, coriaceous, dorsally carinate, sometimes with purple edges, 4 to 10 cm. long. Racemose inflorescence, arched at the end of the branches, up to 4 flowers, short peduncle, with inflated sheath at the base. Floral bract is brown, inflated and compressed, carinate, acute, longer than the ovary, up to 7 mm. long. Flowers are patent, light green, coriaceous. Sepals have purple spots, 6 mm. long and acute, 1.2 mm. wide. Lip is adnate to the column cordiform, acute, with an elevated central nerve, 5 mm. long; disc with a divergent, V-shaped callus underneath the apex of the column. Column is short with 2 apical wings

Habitat: Epiphyte; in cloud forest.

Flowering season: November.

Observations: Common above 1200 m. in Matagalpa and Jinotega provinces, occasionally terrestrial in more open forest, otherwise it grows near the canopy. Not easily distinguished from close allies such as *E. glumarum* and *E. vulcanicola* where more than one of these is found unless flowers are present.

Epidendrum raniferum

Lindley 1831

■ **Description:** Cespitose, 1.20 m. tall. Stems are rigid and foliar, compressed and covered with carinate sheaths. Leaves up to 18 cm. long, dorsally carinate and articulate with sheaths. Racemose inflorescence, up to 18 cm. long, including the peduncle which is covered with imbricate sheaths. Flowers are patent, sepals and petals are green-yellowish with shiny red spots; lip is whitish pink spots and the apices of the lobes are greenish. Sepal is coriaceous, fleshy and obtuse apex, with involute edges, 20 cm. long; falcate petals, 20 mm. long. Lip is adnate near the apex of the column, with lateral lobes deeply serrate and bilobed; apiculate intermediate lobe. Disc with a pair of short calli, fleshy at the base and a central carinae that extends from the base of the callus to the apicule of the intermediate lobe. Column is rigid, nailed, 15 mm. long.

Habitat: Epiphytic at sea level Atlantic slope.

Flowering season: October and sometimes May.

Observations: We in cultivation have seen this species in Costa Rican only in cultivation.

Epidendrum repens

Cogniaux 1909

■ **Description:** Creeping, up to 80 mm. long and very branched; stems are limp and flexible, 1 mm. wide, covered with tight and verrucose sheaths, red-brown, generally foliar in the apical portions. Leaves are dictic, articulate with sheaths, rugose, with retuse apex, olive green, reddish edges, 4 to 10 cm. long. Inflorescence is unifloral at the apex of the branches, sessile. Floral bract is orbicular, carinae, 4 mm. long, scarious edges. Sepals are 7.5 to 8 mm. long, with fleshy, erose and acute apex, slightly verrucose on the underside, 9 nerves. Petals are acuminate, 5 nerves, 7.5 mm. long. Lip is adnate near the apex of the column, fleshy with erect edges, acute, 5 mm. long. Disc with 3 intermediate nerves slightly elevated, 2 to 3 lateral nerves radiant in the base. Column is short, thick 3 mm. long.

Habitat: Epiphyte; in cloud forest 100 - 1200 m.

Flowering season: November-December.

Observations: Uncommon, found on the main trunk of trees under the canopy, prefers moist shady conditions.

Epidendrum santaclarensense

Ames 1923

■ **Description:** Long, pendant, robust, up to 1 m long, branched, with secondary stems that are reflexed, 4 to 8 mm. diameter, covered with maculated sheaths with foliar limbs on the apical portions. Leaves are coriaceous, up to 12 cm. long, apex is obliquely retuse. Terminal inflorescence on stems or very developed branches, 4 or more flowers on the limp flexible raceme; peduncle is hidden behind the coriaceous and maculate sheaths. Flowers are yellow-greenish, coriaceous. Floral bract is inflated, acuminate, 2 cm. long, but not imbricate. Sepals are acute and 1 cm. long, dorsal sepal is 3 mm. wide and lateral sepals are 4 mm. wide. Petal is acute, 10 mm. long is cordiform, 10 cm. long, acute; disc with two thin calli at the base that make a "V" extending to the apex as an elevated nerve. Column is short, with 3 wide teeth on the back.

Habitat: Epiphyte; in wet montane forest.

Flowering season: March

Observations: We have not seen this species, the picture is of a Costa-Rican specimen in cultivation.

Epidendrum scriptum

A. Rich & Gal. 1844

■ **Description:** Thick roots. Stems are up to 90 cm., erect, plain, covered with scarious sheaths, purple when young, with foliar limbs on the apical portions. Leaves are dictic, articulate with sheaths, 18 cm. long, acute. Terminal inflorescence, multifloral, paniculate. Flowers are inconspicuous; sepals are green with purple underside, acute, 15 mm. long. Petals are filiform, 15 mm. long, greenish. Lip is joined to the apex of the column, lateral lobes 8 mm. wide; lateral lobes are greenish, intermediate lobe has the same color as the laterals. Disc is white without purple spots, with 3 elevated calli from the base to the intermediate lobes and two elevated calli at the base. Column is 10 mm. long, white and green at the base with brown anthers.

Habitat: Epiphyte, sometimes terrestrial, grows in cloud forest, above 1000 m.

Flowering season: All year

Observations: Very similar to *E. piliferum*, which has purple spots on the lip

Epidendrum sculptum

Reichembach 1854

■ **Description:** Creeping or pendant, branches, flexible pendulous stems, covered with rigid sheaths, generally with roots along the stem. Leaves are green, up to 4 cm. long, dorsally carinate and truncate. Terminal inflorescence, generally with two sessile flowers and two green sheaths. Flowers are greenish, rigid, do not open very well. Floral bract is conduplicate, 8 mm. long. Sepals and petals with revolute edges, 1 cm. long; dorsal sepal is 2 to 3 mm. wide, acute apex, lateral sepals are shorter than the dorsal. Petals with rounded apex, 10 mm. long. Lip with adnate nail to the column, erect edges, surrounding the 10 mm. long column, acute apex; disc with two membranous lamina at the base that join to form a dilated callus, sulcate in the center and extend together to the apex of the lip. Column is tridentate, 3.5 mm. long.

Habitat: Epiphyte; in low humid areas and near rivers

Flowering season: December

Observations: We have not seen this species in Nicaragua photos from a plant in Costa Rica, information based on Hamer (2001).

Epidendrum selaginella

Schlechter 1906

■ **Description:** Up to 8 cm. long, sometimes branched near the base, creeping rhizome, thin. Secondary stems are erect, glabrous, dictic leaves. Leaves are coriaceous, curved edges, 8 mm. long, articulate with carinate sheaths. Terminal inflorescence with 2 to 8 flowers, filiform peduncle, up to 4 cm. long, with a sheath over the middle. Flowers are patent, successive, yellowish-creamy. Floral bract is acuminate, 3.5 mm. long. Sepals are trinerved, fleshy, triangular, 3 mm. long. Petal is 3 mm. long; adnate lip near the apex of the column by a 1 mm. long nail, lamina is trinerved, acute, 2 mm. long, with erect edges in its natural position. Column is short, 1.8 mm. long with nail.

Habitat: Epiphyte; in wet forest, roots generally grow on a moss layer to keep humid.

Flowering season: October to February.

Observations: It is so small that *Epidendrum* does not initially come to mind. Not very showy even though the plant can form mats of up to 40 cm. across.

Epidendrum stamfordianum

Bateman 1838

Description: fusiform pseudobulbs, 30 cm. long; 3 to 4 leaves, rarely with 5 leaves. Leaves are green, 20 cm. long, coriaceous, articulate with sheaths, obtuse. Lateral inflorescence, occasion-

ally terminal; multifloral panicle, patent or pendant, up to 85 cm. long. Flowers are showy, pale yellow to greenish yellow, with red or purple spots, orange when old. Petals have the same color as sepals but with fewer spots, 20 mm. long. Sepals are 20 mm. long, yellow with purple or red spots. Lip is adnate to the apex of the column, white lateral lobes, yellow when old, rounded, almost complete edges, 18 mm. long; intermediate lobe is bilobed, orange, wavy edges; disc in the base with a pair of white calli with purple spots and a red, elevated carina that reaches almost halfway of the intermediate lobe. Column is green, white and violet apex, 9 mm. long, with 4 lobes on the apex.

Habitat: Epiphyte; mainly grows in dry to moist lowland forest and sometimes on sunny rocks, 0-900 m.

Flowering season: October to December.

Observations: Very common in semi arid and premontane zones, rare in rain forest. Pseudobulbs are similar to *Guarianthe* but generally with 3 leaves and seed capsules on a long raceme instead of near the leaves as in *Guarianthe*. Inflorescence can be from the base of the pseudobulb or terminal, old flowers turn darker yellow.

Epidendrum stangeanum

Reichembach 1881

■ **Description:** Creeping rhizome, elongate and thin, roots on the nodes. Secondary stems are fusiform, 2.5 cm. long, covered with 2 to 3 sheaths with longitudinal stripes, the upper sheath is similar to a leaf, generally unifoliate. Leaves are 4 to 10 mm. long, fleshy and terete when young, but are flattened with time. Penduncle is terminal with the 7 mm. long raceme. Raceme is limp and pendulous with up to 10 flowers. Flowers are green-yellowish, lateral sepals and ovaries are reddish, dorsal sepals are reddish on the upper surface and patent. Floral bract is linear, patent, red and 2.5 mm. long. Sepal is acuminate, trinerved; lateral sepals are falcate, adnate to the column, glandular and verrucose on the outside. Petals are acuminate, 4.5 mm. long. Ascendant lip, adnate to the base of the column, cordate lamina, abruptly contracted to the triangular and acuminate apex, 3 mm. long, flat and concave in natural position, with 3 carinate nerves on the underside. Column is robust, nailed with two teeth that are apical, lateral and obtuse, 3 mm. long.

Habitat: Epiphyte; at 50 to 800 m.

Flowering season: July to October

Observations: Grows to form big plants on the main trunk in open, premontane forest, requires abundant sunlight

Epidendrum strobiliferum

Reichembach 1858

■ **Description:** Cespitose, branched, ascendant to pendant. Secondary stems, covered with purple, maculate sheaths, changing into gray sheaths over time. Leaves are generally singular or in imbricate pairs, dictic, patent, rigid, coriaceous, up to 20 mm. long, with obliquely round apex. Inflorescence composed of a short, paucifloral raceme, 3 to 5 flowers, 1.5 cm. long, penduncle approximately 3 mm. long. Flowers are green-yellowish, coriaceous and sessile. Floral bract is imbricate,

reddish, maculate, 7 mm. long, translucent edges. Sepals are acute, 7 nerves, dorsally carinate, 3 mm. long; dorsal sepal is 1.3 mm. wide and lateral sepal is 1.8 mm. wide. Petal is linear and spatulate, 3 nerved, 3 mm. long. Lip is adnate in the lower half of the column, acute, concave, 3.7 mm. long, including the 1 mm. long nail; disc with tidentate callus, the rest of the lip prominently nerved. Column is short, robust, 2.5 mm. long, with long teeth laterally acuminate at the apex, rostellum is located in the lower half of the column.

Habitat: Epiphyte in rain forest.

Flowering season: November

Observations: Common along the southern shore of lake Nicaragua and along the Rio San Juan. Mostly smallish plants on open trunks with purple leaves.

Epidendrum trachythece

Schlechter 1907

■ **Description:** Cespitose, branched, up to 20 cm. long, with gray roots on nodes and branches. Secondary stems are purple, verrucose, covered with verrucose sheaths, with foliar limbs on the apical portions. Leaves are rigid, coriaceous, olive green, purple spots, articulate with sheaths, 2.5 cm. long, generally two at the end of the branch. Terminal inflorescence at the end of each branch, two to six flowers in a short rachis. Flowers are small and patent; sepals are green-whitish with purple spots; petals and lip are green, apex of the column and anther are red violet. Sepal is convex, 2.5 mm. long, with 5 nerves; dorsal sepal is 1.5 mm. wide and lateral sepals are 2 mm. wide with apices ending in an apicule, dorsally carinate, adnate to the column and at the base of the lip. Petals with 3 nerves, 2.5 mm. long. Lip is adnate to the lower half of column, orbicular, cordate, concave with erect edges, fleshy. Disc with a wide callus, flat and irregularly dentate. Column is short, thick, with fleshy wings.

Habitat: Epiphyte; in cloud forest.

Flowering season: September and October

Observations: We have seen this species only once for sale by a roadside vendor; most flowers did not open and the plant had difficulty adapting to being moved and suffered bacterial attack.

Epidendrum tridens

Poepp. & Ende. 1838

■ **Description:** Robust, cespitose, and short. Secondary stems are compressed, 3 mm. wide and the base is up to 1.5 cm. wide on the apical portion, covered with carinae and compressed sheaths. Leaves are dictic, generally 4, channeled near the base, 10 cm. long, with rounded and retuse apex. Inflorescence is terminal with one yellow flower, rarely 2; yellow-brown sepals, yellow lip, petals and columns are cream. Floral bract is brown, 1.5 cm. long. Sepals are acuminate, 7.5 cm. long, revolute edges, falcate lateral sepals. Petals are acuminate, 6 cm. long. Lip is trilobed, lateral edges are arched, 4 cm. long; intermediate lobe is linear and acuminate, 6 mm. long with an elevated nerve along its length; disc with a membranous and divergent callus, with revolute edges.

Habitat: Epiphyte or terrestrial, sometimes on roadside cliff faces.

Flowering season: August

Observations: Flower similar to *E. nocturnum*, bigger and stem is shorter and more robust. Flowers of *E. carpophorum* are often cleistogamous.

Epidendrum turialvae

Reichembach 1871

■ **Description:** Up to 40 cm. tall. Stems are erect, with apical leaves. Leaves are acuminate, up to 17 cm. long, dorsally carinate, dictic, articulate with sheaths. Terminal inflorescence, penduncle and rachis are up to 15 cm. long; peduncle covered with long flattened sheaths, up to 7 cm. long; raceme has 1 to 4 flowers; the same peduncle can produce another raceme with flowers in different seasons of the year, but in different nodes. Sepals are brown-greenish, petals are green, lip is white with a wide purple callus. Sepals and petals are strongly reflexed touching the ovary. Floral bract is acute, 2 mm. long. Sepals with 5 nerves, 11.5 cm. long; dorsal sepal is concave, apex is fleshy and acute, 3.5 mm. wide, lateral sepals are obliquely spatulate, 5 mm. wide. Petals are filiform, spatulate, 10 mm. long, near the apex, 0.2 mm. wide at the base. Lip is sub-quadrate, 10 mm. long; intermediate lobe is bilobed with truncate lobes; disc with 2 basal calli, obtuse, distal to the calli is an elevated, wide keel that extends up to the sinus of the intermediate lobe, joined on each side by a smaller keel to the base of the intermediate lobe. Column is arched, nailed, 10 mm. long.

Habitat: Epiphyte; in coffee plantations and cloud forest.

Flowering season: The same peduncle can grow three times a year. It flowers almost all year.

Observations: Not very common, requires abundant light on trunks between 2 and 4 meters above the ground

Epidendrum vulcanicola

Heller 1968

■ **Description:** Branched, up to 50 cm. tall. Stems are thin, 30 cm. long, covered with sheaths in the apical portions and naked when old. Leaves, 4-5 acute, elliptical and acute, in the apical portion, coriaceous, 3 to 7 cm. long, articulate with sheaths. Racemose inflorescence, 3 to 4 flowers, up to 6 mm. long. Flowers are showy, pink. Sepals are trinerved; dorsal sepal is acute, 6 mm. long; lateral sepal is acute and arched, 6 mm. long. Petals are 6 mm. long and acute. Lip is cordiform, acute, 4 mm. long; fleshy disc with a conspicuous nerve elevated along the lip and two shorter nerves on the side, with 2 divergent calli at the base, serrate lateral edges. Column is short, 3 mm. long, with serrate apex.

Habitat: Epiphyte; among tree-ferns in cloud forest.

Flowering season: April

Observations: We have not seen it flowering on Maderas Volcano where it is endemic above 800 m.

Epidendrum verrucosum

Sw. 1799

■ **Description:** Erect, robust, up to 2 m tall. Stems are erect, rigid, up to 7 mm. diameter, covered with sheaths having foliar limbs, with leaves on the apical portions, sheaths are red-brown and verrucose. Leaves are acuminate, up to 18 cm. long, dictic, patent. Inflorescence, slightly branched, paniculate, up to 15 cm. long, with about 20 flowers. Flowers are white, with a yellow, patent, callus. Floral bract is small, lanceolate, less than 2 mm. long. Sepals with and acute fleshy 7 mm. apex, concave, verrucose on the underside. Petals are acute, with a fleshy conduplicate apex, 7 mm. long. Lip is adnate near the middle of the column, with 4 lobes, 1 cm. long, including a short nail, 1 cm. wide over the lateral lobes and 6 mm wide over the apical lobes; isthmus between the lateral and the apical lobes, 2.2 mm long; lateral lobes are oblong, truncate, with serrate edges, especially near the apex; apical lobes are 3 mm. long, with a fleshy apicule on the sinus; disc with 3 linear calli elevated from the nail to the isthmus; isthmus is sulcate and with an oblong callus between the apical lobes; column is robust, nailed, 11 mm. long, with 4 apical lobes.

Habitat: Epiphyte and lithophilia, above 1000 m. in dry areas.

Flowering season: October.

Observations: Survives well but it barely flowers out of its natural habitat.

Erycina crista-galli

(Reichembach f.) N.H. Williams. & M.W. Chase 2001

■ **Description:** Small pseudobulbs, up to 10 mm. long, compressed, unifoliate, completely covered with sheaths, the upper ones with foliar limbs. Leaves and foliar limbs are up to 5 cm. long, green, thin, dorsally carinate, acute. Lateral inflorescence of the pseudobulb, few flowered raceme, filiform peduncle, with 3 to 4 inflated sheaths, 3 to 4 mm. long. Flowers are successive, big for the plant, very showy, yellow to yellowish orange, with few orange patches around the callus. Sepals are 6 mm. long, yellow to yellowish orange, with a green carina. Petals are 7 mm. long, same color as the sepals, with wavy acute edges. Lip is 15 mm. long, trilobed, yellow, with few orange patches on and around the callus; lateral lobes are rounded; intermediate lobe is quadrate, with rounded lobes; disc with a fleshy callus, elevated. Column is 4 mm. long, green and yellowish, with wavy edges on the apex.

Habitat: Epiphyte; grows on forest edges and on dry branches; on small trees or in the canopy.

Flowering season: July to November.

Observations: Obligatory Epiphyte on thin branches and normally short lived.

Erycina gnoma

(Kraenzl) N.H. Williams. & M.W. Chase 2001

■ **Description:** Small, sometimes less than 2 cm., the biggest one found was 4 cm. Leaves are sessile, fleshy, 2 cm. Inflores-

cence from the leaf axils, up to 4 cm., with a filiform and 4 cm. peduncle, generally a solitary flower but occasionally the rachis can have two to four successive flowers. Flowers are intense yellow, big for the plant. Floral bract is acute and 2 mm. Sepals and petals are dorsally carinate, acute, with irregular edges; dorsal sepal is 2.8 mm.; lateral sepals are acute, hidden by the lip, 2 mm. Petals are similar to the dorsal sepal. Lip is 9 mm. over the lateral and intermediate lobes; intermediate lobe is big; disc with a long callus, fleshy, it extends to the isthmus of the apical lobes. Column is short, thick, in a 90° angle with the lip, with 2 long wings.

Habitat: Epiphyte on tall trees in non-desciduous broad leaf forest.

Flowering season: January and February.

Observations: Plant much smaller than *E. pusilla* very inconspicuous.

Erycina pusilla

(L.) N.H. Williams. & M.W. Chase 2001

■ **Description:** Without pseudobulbs. Leaves are sessile, dictic, slightly fleshy, 5 cm. Peduncle from the leaf axils, thin, unifloral, with several inflated bracts in the apical portion, up to 8 cm. long. Flowers are successive, yellow, with red-brown patches. Sepals are yellow with red brown spots, wavy edges, 5 to 10 mm. Lip is yellow, longer than petals and sepals; intermediate lobe is big; the entire lip is 2 cm. over the intermediate lobe; callus is fleshy, 5 mm, consistently in 3 yellow lobes with red brown patches. Column is short, thick, with 2 irregularly ciliate or dentate wings on the apex.

Habitat: Epiphyte in premontane forest, 400-600 m.

Flowering season: October to March.

Observations: With *O. gnoma* and other miniature *Oncidiinae* seem to be epiphytic only in small branches and with a relatively short life span. Apparently its life span can be prolonged if the fertilized flowers are not allowed to produce capsules, on the other hand, we have seen spores come out of a capsule that produced dozens of plantlets on the branches all around. We have found local colonies in Guayacan and citrus trees.

Erythroides vesicifera

(Reichembach) 1866

■ **Description:** Basal stems are creeping, then ascendant to erect with leaves in the basal portions, papillose stems with glabrous bracts. Leaves are 7 cm. long, shortly petiolate, with tubular petiole, dilated and surrounding the stem; dark green with pale green. Raceme inflorescence with multi floral terminal. Flowers with pale purple bracts. Sepals are 5.5 mm. long, including the 4 mm. wide spur, flattened, white; apex is strongly reflexed; curved edges. Column is 1.2 mm. long, acute

Habitat: Terrestrial; grows in shaded, wet areas

Flowering season: April

Observations: We have not seen this species; information based on Hamer (2001).

Eulophia alta

(Linnaeus) 1767

■ **Description:** Erect, up to 1.5 m tall; secondary stems are short, surrounded in the tubular bases of the sheaths of the dictic leaves. Leaves are flattened, thin, up to 1 m long. Lateral inflorescence from the base of the pseudobulb, raceme, up to 150 cm. long, densely multi flower. Flowers have variable colors, generally greenish or bronze, with purple lip. Floral bract is 1 to 3 cm. long. Acute sepals; dorsal sepal is 20 mm, lateral sepal is 23 mm. long; petals are 15 mm. long. Lip is articulate with the foot of the column, deeply concave at the base, lateral lobes surrounding the column and rounded apex; intermediate lobe with wavy edges; disc in the lower half with 2 callous protuberances, apical half is conspicuously papillose. Column is erect, nailed, 9 mm. long

Habitat: Terrestrial; grows in open fields up to 1300 m.

Flowering season: March to July

Observations: Rare in Nicaragua, even though it is big, these are isolated plants that grow in the middle of open areas with 1 m tall vegetation, so they are not as showy as expected.

Eurystyles ananassocomus

(Reichembach) Schlechter 1925

■ **Description:** up to 3 cm. tall, white roots, up to 3 cm. long. Leaves are basal, elliptic, apiculate, edges are wavy and crenate, shortly ciliated, 15 to 27 mm. long. Inflorescence is 1.5 cm. long, papillose and covered with bracts. The inflorescence is 1.5 mm. long and consists of up to 25 flowers. Flowers are white; sepals are dorsally pubescent on the apical portion; dorsal sepal is acute, 3.5 mm. long and lateral sepal is 6 mm. long. Petals are free or slightly adnate to the lateral sepals, obtuse and oblique, attenuate towards the base to the linear nail, slightly verrucose at the apex. Column is 4.5 mm. long, with 2 porrect teeth underneath the anther, obsolete rostellum.

Habitat: Epiphyte; in cloud forest at 1200-1500 m.

Flowering season: December

Observations: Small plant, delicate to transport, grows on the mossy trunks in the canopy.

Galeandra dives

Reichembach f. 1854

■ **Description:** 30 to 40 cm. tall; stems are thickened forming erect and slightly compressed pseudobulbs, typically, 20 cm. long. Young pseudobulbs are covered with leaf-sheaths. Leaves are dictic, acuminate, 5 to 20 cm. long. Terminal inflorescence, raceme is same or shorter than leaves, up to 15 flowers in succession. Flowers are showy, with brown-golden sepals and petals; lip is pale purple and yellowish with green-brown stripes, and spots. Floral bracts are 5 to 10 mm. long, acuminate. Sepals are acuminate with revolute edges; dorsal sepal is 2.5 cm. long; falcate lateral sepals, 3 mm. long. Petals with revolute edges, acute triangular apex, 25 mm. long. Lip is deeply retuse, tubular, surrounding the column, 5 cm. long, including the 2.2 mm. long spur. Column is arched with ciliated apical lobes.

Habitat: Epiphyte; grows in the Atlantic slope up to 1200 m., in both wet and dry forests.

Flowering season: April to November.

Observations: Wide distribution, plants are not showy unless they have flowers; produces flowers in succession rarely more than two or three at a time.

Galeottia grandiflora

A.Rich. 1845

■ **Description:** Ovoid pseudobulbs, 3.5 to 6 cm. long and generally with 2 plicate acute leaves that are 25 to 30 cm. long. Inflorescence is 15 to 18 cm. long, from the base of the new shoot with 1 to 5 big and showy flowers. Floral bract is big, wide and thin. Sepals are patent, apices are curved, 3 to 4.5 cm. long, green with red-brown stripes; dorsal sepal is green; lateral sepals are connate at the base forming a gibbose chin with the foot of the column. Petals, obliquely falcate, green with red-brown stripes, 3 to 4 cm. long. Lip is conspicuously trilobed with a short nail, articulates with the foot of the column, white with longitudinal red patches; lateral lobes are erect with imbricate edges; intermediate lobe is somewhat concave, round apex, lateral edges are fimbriate; disc between the lateral lobes with a wide and multidentate callus. Column is short, arched, 1.5 to 2 cm. long with obtuse wings and ciliate edges; the base with a wide, short foot.

Habitat: Premontane and wet forest on the Atlantic slope, reported on mt. Saslaya.

Flowering season: In cultivation, we have seen it flower in August and November.

Observations: We have not seen this species in Nicaragua rather in Costa Rican collections.

Gongora armeniaca

(Lindley) 1850

■ **Description:** Pseudobulbs are slightly compressed with 2 apical leaves, elliptic, and acuminate, 10-20 cm. long. Pendant racemose inflorescence from the base of the pseudobulbs with 3 to 12 showy flowers. Sepals are membranous; sepals and petals yellow or orange with purple-brown spots; dorsal sepal is erect, concave, with a short apicule on the apex, 12 to 18 mm. long; lateral sepals are reflexed, bases inserted in the foot of the column, 15 to 17 mm. long. Petals are orange and acuminate, 4 to 6 mm. long, reflexed apices. Lip with a basal nail, ligular and short, central portion or mesochile is inflated, yellow, 8 to 12 mm. long, apex is widely obtuse, 6 to 10 mm. long. Column is erect, dilated upwards, 9 to 11 mm. long, with a basal foot, elongated rostellum.

Habitat: According to Hamer, it is an Epiphyte, in wet mountains; we found it in San Juan River, which is humid lowland and a possible specimen on Cerro Musun in cloud forest.

Flowering season: April to September

Observations: Rare in Nicaragua we have found only a few isolated specimens which we think may be this species.

Góngora cassidea

Reichembach 1864

■ **Description:** Up to 90 cm. tall, including the pendant raceme. Angular pseudobulbs, slightly compressed, up to 7 cm., with 1 to 2 leaves on the apex. Leaves are acuminate, with 3 prominent nerves, attenuate towards a thin surcate petiole, up to 10 cm. long. Inflorescence at the base of the pseudobulbs, pendant, up to 30 cm. and has up to 15 flowers. Peduncle is up to 10 mm. Flowers are cream, brown-yellow, up to almost purple-brown, floral segments sometimes have orange edges; the cavity of the hypochyle is brown. Dorsal sepal is 15 mm.; lateral sepals are resolute, acute, 25 mm. Petals are falcate, acute, adnate to the basal half of the column, 12 mm. Lip with a 6 mm. nail, articulate with the foot of the column, 27 mm., the superior portion of the lip is 15 mm., divided into two divergent fleshy lobes. Column is compressed, nailed from the front, with two widely rounded wings on the apex and carinae on the short foot of the column.

Habitat: Epiphyte; grows on trees with perennial leaves, above 1000 m.

Flowering season: Principally in May to September, occasionally at other times.

Observations: Locally common. Color of the flower is constant in any plant but there is considerable variation in flower color between plants.

Góngora claviadora

Dressler 1972

■ **Description:** Elliptic pseudobulbs, 4 cm. long, slightly surcate. Leaves are elliptic, abruptly contracted and attenuate towards a very short and acuminate apex, rigidly wavy, 24 cm. long, including the conduplicate 2 cm. petiole. Inflorescence is 28 cm., with 6 red flowers that have a fragrance of cloves. Rachis and peduncle are brown-red. Floral bract is green, tight, 5 mm. Sepals with reflexed edges; dorsal sepal is elliptic, acute and with a wide carinae that is 17 mm.; lateral sepal is oblique, 30 mm., with 3 carinate nerves. Petals are falcate, acute, 9 mm. Lip is 24 mm. long, without protuberances of horns at the base of the hypochyle. Column is 24 mm. long, including the foot of the column.

Habitat: Epiphyte; grows in evergreen and cloud forest from 700 to 1300 m.

Flowering season: December to July

Observations: Fragrant smell of cloves is diagnostic, flower color is variable from uniform dark red to pale pink.

Góngora leucobila

Lem. 1845

■ **Description:** Up to 70 cm. tall, including the pendant raceme. Pseudobulbs are conical, bifoliate, 5 to 8 cm., surcate longitudinally. Leaves are acuminate, plicate and with prominent nerves, up to 35 cm., conduplicate petiole, 10 cm. long. Inflorescence is lateral, pendant, raceme, up to 35 cm. including the 12 cm. peduncle. Peduncle is covered with a few scari-

ous reddish maculate sheaths, 1 cm. long. Floral bract is tight, up to 3 mm. long. Flower color is very variable, from maculate brown to dark red. Dorsal sepal grows near the apex of the column, 30 mm., with revolute edges; lateral sepals are acuminate, widely triangular near the base, 35 mm. long. Petals are adnate to the sides of the column, lanceolate and acuminate, up to 9 mm. long. Lip is continuous with the foot of the column, fleshy, 25 cm., laterally compressed, the superior half is deeply excavated with an apex similar to a spur. Column is arched, 10 mm. long, with a 13 mm. long foot.

Habitat: Epiphyte; grows in wet tropical forest, generally at low elevation 0-700m.

Flowering season: December to August.

Observations: Formerly known as *G. quinquénervis* and possibly including more than one species which are still undefined, it is like the trash can of anything that does not fit as *G. unicolor* and *G. claviadora*. What makes classification more difficult is that we suspect that some forms may be natural hybrids.

Góngora truncata

Lindl. 1843

■ **Description:** Pseudobulbs are slightly compressed with 2 apical leaves, elliptic, and acuminate, 10-20 cm. long. Pendant racemose inflorescence from the base of the pseudobulbs with 3 to 20 showy flowers. Sepals are membranous; sepals and petals yellow with purple-brown spots; dorsal sepal is erect, concave, with a short apicule on the apex, 12 to 18 mm. long; lateral sepals are reflexed, bases inserted in the foot of the column, 15 to 17 mm. long. Petals are orange and acuminate, 4 to 6 mm. long, reflexed apices. Lip with a basal nail, ligular and short, central portion or mesochile is inflated, yellow, 8 to 12 mm. long, apex is widely obtuse, 6 to 10 mm. long. Column is erect, dilated upwards, 9 to 11 mm. long, with a basal foot, elongated rostellum.

Habitat: Wet mountains above 1200m.

Flowering season: January, February.

Observations: Rare in Nicaragua we have found it in the cordillera de Dipilto and Peñas Blancas.

Góngora unicolor

Schlechter 1923

■ **Description:** Plant to 60 cm. Pseudobulbs bifoliate, up to 12 cm. long, with 8 deep conspicuous keels. Leaves are acuminate with wavy edges, up to 50 cm. long, including the 12 cm. petiole, conduplicate and twisted, with very pronounced nerves. Pendant inflorescence, 50 cm. long, with approximately 7 to 15 patent flowers. Flowers are pink with a sweet fragrance. Floral bract is triangular, tight, 3 mm. long. Dorsal sepals are carinate, 25 mm. long; lateral sepals are 35 mm. long. Petals are 10 mm. long, falcate, with a filiform curved apex. Lip is fleshy, 31 mm. long, with lobes curved, falcate and acuminate, 4 mm. long on each side near the base. Column is 15 mm. long with a 10 mm. foot

Habitat: Epiphyte in Atlantic slope forest 30-400 m.

Flowering season: April to June

Observations: Similar habitat as *G. claviadora*, pale, but with floral fragrance

Goniochilus leochilinus

(Reichembach) 1871

■ **Description:** Up to 15 cm. tall. Pseudobulbs are flattened, lucid green, 17 mm. long, unifoliate, rarely bifoliate. Leaves are coriaceous, dark green, dorsally carinate, 8 to 11 cm. long including the conduplicate petiole which is 1 cm. long, with a very acute, oblique, retuse and conduplicate apex, nerved lamina, erose edges. Racemose inflorescence, pendant and occasionally branched, up to 23 cm. long, including the 8 to 10 cm. long peduncle; rachis is green to purple with 5 to 15 flowers. Flowers are campanulate; sepals and petals are green yellowish with big red-brown spots; lip is white with red stripes and spots. Floral bract is acuminate, 5 mm. long; the pedicel ovary is 8 mm. long and arched. Sepals are coriaceous, with an erose apex and a dorsally carinate apicule; dorsal sepal is 8 mm. long; lateral sepals joined to their tertiary parts, sometimes completely free, concave, 7 to 9 mm. long. Ligulate petals, 7 mm. long, dorsally carinate. Lip is oblong, more or less erect and parallel to the column, with a sacciform nail that has a triangular tooth on each side; intermediate lobe is sub-quadrate, deeply retuse, with rounded lobes, 4 mm. long, reflexed, forming a 90° angle with the rest of the lip.

Habitat: Epiphyte; grows in small branches in the cloud forest, 1000-1400 m.

Flowering season: August to October.

Observations: Inconspicuous, short-lived, forms small colonies in isolated trees.

Goodyera bradeorum

Schlechter 1923

■ **Description:** Up to 35 cm. tall, 3 mm. thick roots. Stems are foliate, glabrous on the inferior portions. Up to 10 flowers, apical leaves are smaller, with three prominent nerves, edges are slightly wavy, green-bluish on the underside, dorsally carinate, acuminate, up to 11 cm. long, including the 1 to 2 cm. petiole that surrounds the stem, 3 cm. wide. Inflorescence is apical, cylindrical, densely multifloral, 5 cm. long. Flowers with white-greenish sepals, lip is white and petals with green nerves. Floral bract is acuminate, 7 mm. long. Sepals are uninerved, obtuse; dorsal sepal is lanceolate, 5 mm. long; lateral sepal is oblique, 5.2 mm. long, concave and forms a conspicuous protuberance around the sacciform base of the lip. Petals are uninerved, with erous dentate anterior edges 4.5 mm. long. Lip is sessile, naturally arched with sacciform base, three carinate nerves, rounded apex and crenulate edges, ending in a truncate green apicule, 5 mm. long. Small column, 2 mm. long.

Habitat: Terrestrial; in cloud forest.

Flowering season: December

Observations: We have not seen this species; information from Hamer (2001).

Goodyera erosa

(Ames & Schweinfurth) 1930

■ **Description:** Up to 35 cm. tall, fibrous and flexible roots, short stems, surrounded completely in the imbricate bases of the petioles underneath the leaves, generally with 4 aggregate and acuminate leaves that are 4 to 6 cm. long. Peduncle including the 25 cm. tall raceme covered with lanceolate and sometimes foliar sheaths. Inflorescence in raceme, loosely multifloral. Floral bracts are 7 to 10 mm. long. Flowers are small, 4 mm. long. Sepals are slightly pubescent in the bases, 3.5 to 4 mm. long; oblique lateral sepals. Petals adhere to the dorsal sepal; lip is 4 to 4.5 mm. long, strongly sacciform in the basal portion, the sacciform portion with few tubers on the interior. Column is small and short.

Habitat: Terrestrial; grows on dwarf, cloud forest above 1000 m.

Flowering season: October

Observations: We have not seen this species; information from Hamer (2001).

Goodyera major

Ames & Correll 1942

■ **Description:** Big plant for the genus, creeping stems with thick roots, up to 80 cm. tall, glabrous on the basal portions with apical leaves. Basal leaves are inflated and surround the stem, green carinae. Inflorescence is terminal, raceme multifloral. Up to 40 flowers, white to yellowish, with green and pubescent pedicel ovary, 12 mm. long and a bract with the same length, pubescent at the base. Petals are 7 mm. long, white with a green stripe in the center, edges on the posterior part are erose to dentate, both petals adhere to the dorsal sepals. Lip is 6.5 mm. long, white with a green stripe, from the base to apex, basal portion is globular to sacciform, with several tubers inside, the apical portion is dilated and plicate, retuse and with erose edges. Column is 3 mm. long, white.

Habitat: Terrestrial; grows in cloud forest.

Flowering season: October.

Observations: We have found this species only once in small colony on top of a hill in Jinotega at 1300 m. A specimen that had been cut with a machete, spontaneously sprouted a new plant.

Govenia liliacea

(Llave & Lex) 1795

■ **Description:** Up to 45 cm. tall, surround the base with along red-violet sheath which is to 15 cm. long. Rhizome is thickened, bulbous, with 6 cm. long bulbs, generally with two leaves that are acuminate and articulate with nervous sheaths; limbs are 30 cm. long, carinate nerves, somewhat purple on the underside; leaves are larger than the inflorescence. Rachis is up to 4.5 cm. long, with more or less 5 successive flowers. Flowers are whitish-cream, petals and sepals are purple, lip is yellow and always with five prominent brown-red spots on the apical edges; column is white with purple, longitudinal stripes. Petals

are acute, five nerves, with curved apex, 16 mm. long. Sepals have five nerves; dorsal sepal is 22 mm. long and lateral sepal with curved apex, 14 mm. long. Lip is arched in natural position, slightly contracted above the middle; apex with a wide and short tooth. Column is robust, nailed and arched, the apical half widest and the basal half is a little winged, 9 mm. long with a 4 mm. foot.

Habitat: Terrestrial; in cloud forest edges.

Flowering season: August and September.

Observations: The most common govenia in Nicaragua above 1000 m., violet stem is diagnostic.

Govenia mutica

Reichembach 1852

■ **Description:** Up to 80 cm. long, surrounded at the base by long, tubular purple sheaths, up to 28 cm. long, with two big leaves, articulate with sheaths, dorsally with three prominent nerves, limb is 45 cm. long. Inflorescence up to 40 cm. long with a densely multifloral spike. Peduncle is robust, red-violet, provided with 3 green-reddish sheaths, inflated, acuminate. Flowers are white, except for the lip and the foot of the column are cream. Floral bract is acuminate, 2 cm. long. Sepals and petals with 5 nerves, contracted towards a falcate, conduplicate and acuminate apex; dorsal sepal is 14 mm. long and lateral sepal is 11 mm. long. Petals are 13 mm. long; lip is arched near the base, apical tooth is reflexed; disc with a wide lateral fold on each side. Column is short, nailed, winged, with wings more conspicuous near the apex and the foot of the column

Habitat: Terrestrial; grows in cloud forest edges and light gaps.

Flowering season: September and October.

Observations: We have found this species along forest edges at the top of Mombacho Volcano.

Govenia pupusii

Schlechter 1918

■ **Description:** Up to 35 cm. tall, glabrous stem, robust. Leaves are dark green, velvety, with a white longitudinal nerve in the middle, acuminate, with wavy edges, 6 to 8 cm. long, petiole is thin and conduplicate, up to 1.5 cm. long, which dilates in a short sheath. Peduncle is erect, thin, densely pubescent, 15 cm. long wide up to the first flowers, five tight sheaths, acuminate, 1 to 2.5 cm. long. Inflorescence is 5 cm., with up to 20 flowers. Flowers are small, white, the base of the sepals is green. Floral bract is acuminate, 1 cm. long. Sepals are attenuate to the apex, concave underneath, conduplicate apex; dorsal sepal is 1.8 mm. wide and lateral sepals are 2 mm. wide. Petals are erect, slightly adnate to the dorsal sepals, dilated in the anterior edge of the apical half. Lip is sessile, deeply concave, sacciform, with curved edges; disc with three green nerves and a bifid callus from the base to the middle of the lip. Column is 2 mm. long.

Habitat: Terrestrial; grows in cloud forest and rocky outcrops.

Flowering season: November and December.

Observations: More common than *G. mayor* in the same habitat, easy to recognize by the white line in the middle of the leaf.

Govenia utriculata stat.

(Sw.) Lindl. 1839

■ **Description:** Thickened rhizome in pseudobulbs, up to 5 cm. in diameter from which two leaves and the inflorescence grow; basal portions are surrounded by inflated reddish-purple sheaths. Leaves are big, green, with pronounced nerves, 40 cm. long, acute and attenuate towards the base. Inflorescence in raceme, with approximately 12 big flowers. Flowers are white with small, wavy pale violet lines, especially in the petals. Dorsal sepal is 25 mm. long, white; lateral sepal is falcate, 22 mm. long. Petals are 20 mm. long, falcate, white, with wavy, light purple or pale violet lines. Lip is 10 mm. long, curved, channeled, white, 2 to 3 brown spots on the dorsal apical margins and on the underside. Column is 10 mm., curved, dilated and winged at the apex, white, with several brown spots.

Habitat: Terrestrial; grows in pine forest with rocky substrate.

Flowering season: July and August.

Observations: Even though we found this species to be common in Mexico, we have not found it in Nicaragua- the habitat in Mexico is pine forest.

Guarianthe aurantiaca

(Bateman ex. Lindley) 1840

■ **Description:** Pseudobulbs are 20-40 cm. long, thick, fleshy, slightly compressed, with membranous sheaths, thicker towards the apex of the base, bifoliate. Leaves are 12 cm. long, coriaceous, green, under sunlight they are purple. Inflorescence in raceme, 3 to 10 flowers. Peduncle is terete, at the base with a compressed spathe. Flowers are showy, red-orange. Dorsal sepal is 21 to 28 mm. and lateral sepal is 21 to 27 mm. long, red-orange, rarely yellow. Lip is 20 mm. long, curved edges, red-orange apiculate with small, purple lines and pale green on the underside. Column is 8 mm. long, dilated at the apex, white-yellowish.

Habitat: Epiphyte; grows in dry pastures in mountains or hedgerows along roads. Typically in sunny places, big branches or forks of trunks at approximately 600-1200 m. above sea level.

Flowering season: December to March

Observations: Plants are smaller and found at higher elevation than *G. skinneri*, but both can be found in the same tree.

Guarianthe skinneri guatemalensis

Moore 1861

■ **Description:** Elongated pseudobulbs and two apical leaves similar to those in *G. skinneri* and *G. aurantiaca*; it is proven that this species is a natural hybrid between both *Guarianthe* now treated as a variant of *G. skinnerii*. Flowers differ from both plants and colors are variable from pale pink to magenta and red-orange. Sepal is 3.5 cm. long, petals are 4 cm. long. Lip is

2.5 cm. long, with two curved lateral lobes, surrounding the column, the apical portion is dilated to form a widely rounded apex, slightly retuse, sometimes shortly apiculate. Column with nail, thin, tridentate at the apex.

Habitat: Epiphyte; grows at low altitudes generally less than 400 m.

Flowering season: December and January.

Observations: Even though they exist in nature, we have seen this variation only in cultivation.

Guarianthe skinneri

Bateman 1838

■ **Description:** 35 cm. long pseudobulbs, laterally compressed and attenuate toward the base. Leaves are up to 18 cm. long, thick, coriaceous, green to green-yellowish. Inflorescence in raceme, with 3 to 9 flowers. Peduncle with spathe, 6 to 7 cm. long and very compressed. Flowers, violet; sepal is 55 mm. long and violet. Petals are 55 mm. with wavy edges and somewhat curved. Lip is recurved, 50 mm. long, violet the basal part, with dark violet nerves, followed by an almost white center, which with time turns violet towards the apex and the lateral edges. Central nerve is elevated and darker. Column is 12 mm. long, white with violet spots.

Habitat: Epiphyte and lithophilic; grows in hot areas, 300-1000 m.

Flowering season: December to March.

Observations: These can grow into big colonies of several square meters. Although protected, it is difficult to find them in accessible places because they are still exploited.

Guarianthe pachecoi

Ames & Correll 1943

■ **Description:** 20 cm. long pseudobulbs, fusiform, somewhat compressed, bifoliate at the apex, covered with scarious sheaths. Leaves are patent, retuse at the rounded apex, 15 cm. long. Peduncle is fleshy, covered with several small sheaths, triangular, at the base with a 6 to 7 cm. long spathe. Flowers are fragrant, yellowish-green. Sepals with reflexed edges, obtuse, 40 mm. long; petals with wavy edges, elliptical, shortly apiculate, 40 mm. long. Lip is pale yellow, with curved lateral edges, surrounding the column with the basal portion, expanded in the apical portion; apex is widely rounded and finely retuse; disc with slightly elevated veins. Column is nailed, 1 cm. long.

Habitat: Epiphyte; grows on hills around 1000 m.

Flowering season: January.

Observations: We have not seen this species, information from Hamer (2001).

Guarianthe patinii

Cogniaux 19--

■ **Description:** A hybrid between *G. guatemalaensis* and *G. skinneri*; up to 50 cm. tall, leaves and pseudobulbs as *G. skinneri*; flower generally cleistogamous, rarely opens well but

produces capsules. Sepals and petals are pink as *G. skinneri*, lip is smaller with the apex in the tip.

Habitat: 300-600 m., premontane forest.

Flowering season: December-January.

Observations: We have found it several times in Boaco where it seems more common than *G. skinneri*, while the non-hybrid species are more abundant in Estelí.

Habenaria alata

Hook 1826

■ **Description:** Graceful, glabrous, up to 60 cm. tall. Stems are simple, slightly compressed. Leaves are acuminate, up to 10 cm. long. Inflorescence is 7 cm. long, with 15 to 20 pale green flowers. Floral bract is 2.3 cm. long; sepal with densely papillose edges and apiculate apex; dorsal sepal with three papillose nerves, 6 mm. long; lateral sepal is 6.5 mm. petals with a small lobe on the anterior edge, 6 mm. long. Lip is thick, fleshy, with a quadrate and inflated base but no auricle, 6.5 mm. long, with a 1.2 mm. long nailed spur. Column is 3 mm. long and wide.

Habitat: Terrestrial in open hillsides.

Flowering season: September to November.

Observations: We have not seen this species; information from Hamer (2001).

Habenaria clypeata

Lindl 1835

■ **Description:** Ovoid tuber at the base of the stem, up to 20 cm. tall, foliose stem. Leaves are small, acute, strongly conduplicate, with wavy edges, up to 5 cm. long. Inflorescence in raceme, 6 cm. long, 8 to 10 white flowers with a green callus and a pale green spur. Floral bract is big and acuminate, tight, dorsally carinate, 3 cm. long. Sepals are concave, 8 mm. long, dorsal sepal is 5 mm. wide; lateral sepals are oblique, with revolute edges and dorsally carinate, 4 mm. long. Petals are divided in two, posterior lobe is oblong and falcate, anterior lobe is filiform and 10 mm. long. Lip from the base is 3 mm; intermediate lobe is obtuse, 6 mm. long; lateral lobes are filiform, 8 mm. long; nailed spur, curved, and 2 cm. long.

Habitat: Terrestrial and lithophilic in alpine pine forest.

Flowering season: August.

Observations: We have not seen this species; information from Hamer (2001).

Habenaria distans

Griseb 1866

■ **Description:** Up to 20 cm. long. Stem is covered with three to four foliar sheaths, up to 4 cm. long. Leaves are essentially basal, acute, wavy edges, up to 14 cm. long. Inflorescence in raceme, loosely paucifloral, approximately 7 green flowers. Floral bracts are shortly lanceolate, acuminate, 2 cm. long. Dorsal sepal is suborbicular, concave, 6 mm. long; lateral sepals are acute, revolute edges, 8 mm. long. Petals are divided in two, anterior lobe is filiform, longer than the posterior lobe which is

5 mm. long. Lip is tridentate, intermediate lobe is shortly linear, 8 mm. long, lateral lobes are filiform, patent, with curved apex, 11 mm. long; spur is gradually compressed, nailed at the apex, 16 mm. long.

Habitat: Terrestrial on moist hillsides 900-1500 m.

Flowering season: August to September.

Observations: We have seen this relatively small species on Mombacho Volcano in open areas.

Habenaria entomantha

(Llave & Lex) Lindl 1835

■ **Description:** 15 to 35 cm. tall, underground tubers, small, stems completely covered with foliar sheaths and leaves distributed along the stem. Leaves are green, acuminate, dictic, 2 to 8 cm. long. Inflorescence in raceme, 10 to 20 flowers. Flowers are small, green, inconspicuous. Dorsal sepal is concave, 7 mm. long, lateral sepals are 8 mm, carinate along the central nerve, the carinae and the edges are finely dentate. Petals are divided in two, glabrous, posterior lobe is 6 mm. long, anterior lobe is filiform and 9 mm. long. Lip is green, divided into three, with a greenish spur that is 14 mm. long, curved and nailed, intermediate lobe is 8 mm, laterals are filiform, descendant and 11 mm. long. Column is 2 mm. long and white.

Habitat: Terrestrial; according to Hamer, it grows on dry lava. We found it terrestrial in a semi-closed forest.

Flowering season: June to September.

Observations: Like many *Habenarias*, flowers are very long-lasting, opening first at the base, progressing up the inflorescence over a month. Plants in cultivation flowered very nicely but died after flowering once.

Habenaria eustachya

Reichembach 1885

■ **Description:** Up to 1 m tall. Stems with subterranean tubers, 6 cm. long, erect, covered with leaves along its entire length. Leaves up to the mid-section of the stem, largest at the base portion, up to 15 cm. long. Inflorescence in multifloral raceme, 50 flowers. Flowers are green; dorsal sepal is 4 mm. long, concave; lateral sepals are 6 mm. long, green. Petals are simple, rounded to truncate, uneven apex, 4 mm. long, green to green-yellowish. Lip is simple, 6 mm. long, with a green spur that is nailed and 11 mm. long. Capsule is 15 mm. long.

Habitat: Terrestrial; grows in disturbed montane forest.

Flowering season: November-December.

Observations: This is the most common *Habenaria* in the Matagalpa-Jinotega forests and forest edges.

Habenaria floribunda

Lindley 1835

■ **Description:** Robust, foliose stems, up to 80 cm. tall. Leaves are acute, up to 17 cm. long, central nerve is deeply carinate with a less pronounced nerve on each side. Inflorescence is densely multifloral, with a cylindrical, 20 cm. long raceme.

Flowers are green with a white column. Floral bract is acuminate, as long as the ovaries, 1.5 cm. long. Sepals have erose whitish edges; dorsal sepal is elliptic, obtuse, concave, curved edges, 6.5 mm. long; lateral sepals are falcate, obtuse, 7 mm. long. Petals are falcate, with one or two obtuse teeth on the apex, base of the anterior edge is auricular, 5 mm. long. Lip is 8 mm. long, with a very short nail, 1.5 mm. wide near the base; spur is 10 mm. long.

Habitat: Epiphyte; grows in coffee farms.

Flowering season: October to December.

Observations: We have not seen this species; information from Hamer (2001).

Habenaria mesodactyla

Griseb. 1864

■ **Description:** 30 to 45 cm. long. Stems are covered with few sheaths at the base and few linear leaves, very tight and acuminate along the stem. Leaves are green, 5 cm. long. Inflorescence in raceme, loosely paucifloral, with 2 to 6 small flowers, pale green; floral bract broadly acuminate and 10 to 12 mm. long. Sepals with erose edges, dorsal sepal is concave, 3 mm. long and lateral sepals are reflexed, 4 mm. long. Petals are bipartate, posterior lobe is a little shorter than the dorsal sepal, anterior lobe is filiform, 3.5 to 4 mm. long, longer than the posterior lobe. Lip tripartate, intermediate lobe is 4 mm. long and lateral lobes are 5 mm. long. Spur is pendant, dilated towards the apex, 7 to 10 mm. long.

Habitat: Terrestrial; grows in open pine forest.

Flowering season: August.

Observations: We have not seen this species; information from Hamer (2001).

Habenaria monorrhiza (Sw)

Reichembach 1885

■ **Description:** Robust, glabrous, up to 120 cm. tall, stems are foliate, covered with maculated sheaths. Leaves are acute, with wavy and scariosa edges, up to 10 cm. long. Inflorescence in raceme, up to 20 cm. long, densely multifloral, with white flowers. Floral bract is acuminate, 13 mm. long. Dorsal sepal is concave, 9 mm. long; lateral sepals are 8 mm. long. Petals are bipartate, posterior lobe is ligulate and obtuse; anterior lobe is filiform, falcate, 7 mm. long. Lip is trilobed, intermediate lobe is ligulate, 7 mm. long, lateral lobes are filiform in a 90° angle with the intermediate lobe, 9 mm. long; spur is thin, 20 cm. long, nailed column is 4 mm. long.

Habitat: Terrestrial; grows in moss deposits and clay soil along the road, 1000-1300 m.

Flowering season: November.

Observations: This species has a wide distribution and is locally abundant in open, sunny areas, habitat almost like *Epidendrum radicans*. As with other *Habenaria*, we have not succeeded in getting plants to survive after flowering in cultivation. This plant does not die immediately, it flowers normally,

but does not re-sprout the following year even though wild plants do so.

Habenaria novemfida

Lindl. 1842

■ **Description:** 30 to 40 cm. tall, glabrous, stems are surrounded by leaf sheaths. Leaves along the stem, up to 9 cm. long in the center, shorter towards the apex and the base, acute and patent. Inflorescence in raceme, generally has 10 to 15 flowers, pale green or green yellowish, with green bracts, acuminate, 8 to 20 mm. long. Flowers with pedicel ovary, dorsally with 3 conspicuous carinae. Petals are bilobed, posterior lobe is falcate, 8 mm. long, anterior lobe is filiform and 12 mm. long. Lip is tripartate; spur is 25 mm. long, curved, thickened near the apex.

Habitat: Terrestrial; in sloping oak and pine forest.

Flowering season: August and September.

Observations: We found this species in Mexico but we have not seen Nicaraguan specimens.

Habenaria odontopetala

Reichembach 1844

■ **Description:** Robust, foliose stems, up to 70 cm. tall. Leaves are acute, up to 16 cm. long, central nerve is deeply carinate and with a less pronounced nerve on each side. Inflorescence is densely multifloral, with a cylindrical, 18 cm. long raceme. Flowers are green with a white column. Floral bract is acuminate, 1.5 cm. long. Sepals have erose whitish edges; dorsal sepal is elliptic, obtuse, concave, curved edges, 6.5 mm. long; lateral sepals are falcate, obtuse, 7 mm. long. Petals are falcate, with one or two obtuse teeth at the apex, base of the anterior edge is auricular, 5 mm. long. Lip is 8 mm. long, with a very short nail, 1.5 mm. wide near the base; spur is 10 mm. long.

Habitat: Terrestrial in coffee farms 900 m. and up.

Flowering season: October to December.

Observations: Reported for Nicaragua, but we have not seen it.

Habenaria oerstedii

Reichembach 1855

■ **Description:** up to 45 cm. tall, folious and somewhat compressed stem. Leaves are acute, up to 9 cm. long, diminishing its size towards the apical portion turning into bracteate sheaths. Inflorescence in dense raceme, approximately with 15 greenish flowers. Floral bract is acuminate, up to 15 mm. long down and 10 mm. up. Sepals are deeply concave, with conduplicate apex; dorsal sepal is 6 to 7 mm. long and lateral sepal is 7 mm. long. Petals with anterior edges expanded on the basal half; triangular apex, 6 mm. long on the basal portion. Lip is oblong, 8 mm. long, base is slightly auricular, disc with 3 slightly elevated keels that extend to the truncate apex of the lip and end in small lobes or teeth.

Habitat: Terrestrial; in wet areas.

Flowering season: January.

Observations: We have not seen this species; information from Hamer (2001).

Habenaria pringlei

B.L. Rob. 1894

■ **Description:** Glabrous, foliose stem, up to 1 m tall. Leaves are up to 20 cm. linear to narrowly lanceolate, acuminate, conduplicate and carinate, 9 to 20 cm. long. Floral bracts are acuminate. Raceme is loosely paucifloral. Flowers are long, white and pale green. Dorsal sepal is elliptic, acute, concave, curved at the apex, 13 mm. long; lateral sepal is oblique, 15 mm. long. Petals are bilobed, the posterior lobe is falcate, 1.2 to 2 mm. long, anterior lobe is filiform, 14 mm. long. Lip is trilobed with a linear intermediate lobe, 18 mm. long, lateral lobes are filiform, 19 mm. long. Spur is thin, 5 to 15 cm. long.

Habitat: Terrestrial, near water.

Flowering season: June to September.

Observations: We have not seen this species; information from Hamer (2001).

Habenaria quinqueseta

(Michx.) 1829

■ **Description:** 80 to 90 cm. tall, subterranean tubers. Stems are covered with foliate pale green sheaths. Leaves along the stems are 12 to 15 cm. long, shorter towards the base and apex; carinae, green-yellowish to light green. Flowers are green yellowish; floral bract is carinate. Dorsal sepal is 11 mm, lateral sepal is 14 mm. long, green yellowish. Petals bipartate, same color as sepals, posterior lobe is 11 mm. long and white; anterior lobe is 33 mm. long, filiform. Lip is trilobed, whitish to green yellowish; intermediate lobe is 15 mm. long and lateral lobe is 30 to 35 mm. long, filiform and rolled; spur up to 13 cm. long, somewhat dilated towards the apex.

Habitat: Terrestrial; grows in dry forest, at less than 300 m. and reportedly in open fields.

Flowering season: July and August.

Observations: The only specimen we have found is in the private reserve of Domitila and only flowered once in the last three years.

Habenaria repens

Nutt. 1818

■ **Description:** 90 cm. tall. Stem is covered with leaves all along. Leaves up to are 18 cm. long, acuminate, with three conspicuous carinae on the underside, light green. Inflorescence in raceme with 20 to 30 flowers. Flowers with a pediceled ovary, 2 cm. long. Sepals are green; dorsal sepal is concave, 5 mm. long; lateral sepal is 5.5 mm. long, apiculate and with finely dentate edges. Petals are bipartate, light green; posterior lobe is 5 mm. long, anterior lobe is filiform and 5 mm. long. Lip is tripartate and green yellowish; intermediate lobe is 5 mm. long, lateral lobe is 6 mm. long, with rolled apices; spur is light green to green yellowish, 10 mm. long.

Habitat: Terrestrial and sometimes semi-aquatic; grows in swampy areas of the savannah or natural reservoirs.

Flowering season: October, more or less the whole year.

Observations: We have not seen this species; information from Hamer (2001).

Habenaria strictissima

Reichembach 1844

■ **Description:** 60 cm. tall, angular stems, covered with leaves along the upper two thirds. Leaves are patent, with three conspicuous carinae on the underside, 9 cm. long, decreasing towards the apex and more pronounced towards the base. Inflorescence in raceme, up to 25 green flowers; floral bract is 1 cm. long, green. Dorsal sepal is 5 mm. long, concave, almost orbicular, with three conspicuous nerves; lateral sepal is 6 mm. long, green with white translucent edges. Petals are simple, 4 mm. long, semicircular, green yellowish. Lip is simple, 8 mm. long, with a basal tooth on each side, somewhat curved, with a thin spur, 28 mm. long. Column is green and white.

Habitat: Terrestrial or lithophilic; grows at low elevation and wet climate.

Flowering season: September

Observations: We have not seen this species; information from Hamer (2001).

Habenaria trifida

Kunth 1815

■ **Description:** Up to 35 cm. tall, underground tubers. Stems are thin, covered with foliar sheaths. Leaves are acute, acuminate, 9 cm. long, green, turning into bracts towards the apical portion, erect or slightly patent, surrounding the stem with their bases. Inflorescence is terminal, paucifloral, 1 to 3 mm. long. Flower is white; dorsal sepal 8mm. long lateral sepals 10 mm. Petals are bilobed; inferior lobe is falcate, linear and fleshy, 10 mm. long. Lip is trilobed near the base, pendant; lateral lobes are somewhat patent; intermediate lobe is 10 to 12 mm. long; elongated spur, 4 to 6 cm. long, arched; basal portion is thin, nailed towards the apex. Column is short.

Habitat: Terrestrial; grows around bushes near saline areas, pastures, savannah at low elevation.

Flowering season: August and September.

Observations: We have not seen this species; information from Hamer (2001).

Habenaria umbratilis

Ames & Williams 1941

■ **Description:** Robust and leafy, up to 70 cm. tall. Leaves with wavy edges, articulate with maculated sheaths, up to 6 cm. long near the base, becoming smaller towards the apex and turning into bracteate sheaths. Inflorescence in a dense raceme, 8 cm. long, with white flowers and yellow spur. Floral bract is acuminate, 13 mm. long. Sepals are acute, verrucose apex; dorsal sepal with seven nerves, 10 mm. long; lateral sepal is oblique, curved

edges and five nerves, 7 mm. long. Petals with or without basal lobes or auricles, acute, with 5 nerves, 7 mm. long. Lip is trilobed, 10 mm. long, including a 1 mm. long nail; intermediate lobe is 8 mm. long at the base; lateral lobes are filiform, 5 to 6 mm. long; sub-nailed spur, 25 mm. long. Column with well developed processes, stigma well developed.

Habitat: Terrestrial in wet areas.

Flowering season: January.

Observations: We have not seen this species; information from Hamer (2001).

Habenaria wercklei

Schlechter 1923

■ **Description:** Up to 25 cm. tall, stems covered with foliar sheaths, with bigger leaves in the basal portion, diminishing upwards. Leaves are green, acuminate, distic, 2 to 7 cm. long, erect and conduplicate. Inflorescence in raceme, with approximately 15 green flowers. Sepals are carinate and apiculate on the apex; dorsal sepal is 4.5 mm; lateral sepals are 5 mm. long. Petals are divided into two, posterior lobe is 5 mm. long, anterior lobe is filiform and 10 mm. long. Lip is trilobed, green yellowish, intermediate lobe is 7 mm. long; lateral lobes are filiform and 9 mm. long, pendant; spur is 9 to 10 mm. long. Column is short, greenish with white.

Habitat: Terrestrial in open lowland.

Flowering season: October.

Observations: We have not seen this species; information from Hamer (2001).

Hapalorchis lineatus

(Lindley) 1840

■ **Description:** 15 to 20 cm. tall, thick with fleshy roots. Leaves are basal, lamina is up to 3.5 cm. long, thin petiole, 2.5 cm. long, green. Peduncle including the raceme is 12 to 18 cm. long, with several acute sheaths. Inflorescence in raceme, 2 to 4 flowers. Flowers are yellow greenish, 1 cm. long pedicel ovary, slightly glandular. Lateral sepal are 8 mm. long, acute and patent; dorsal sepals are obtuse, 7 mm. long, concave at the base, crenulate apex, conspicuously uninerved. Lip is 8 mm. long, rounded and concave at the base, with a short and small nail, the fourth apical part is expanded in a wide and obtuse sheet, 2 mm. long, after an abrupt contraction where the apical portion turns downwards. Column is 6 mm. long, thin.

Habitat: terrestrial.

Flowering season: Not known.

Observations: We have not seen this species; information from Hamer (2001).

Helleriella nicaraguensis

Hawkes 1966

■ **Description:** Plant up to 3 m tall, stems with leaves only in the apical portions, fleshy flexible robust roots, black rhizome. Stems are apically compressed, roots at the bases and

nodes covered with 2 cm. long sheaths. Leaves are articulate with sheaths, dictic, carinate, with obliquely obtuse apex, up to 13 cm. long and the ones on the branches are 8 cm. long. Inflorescence is terminal, or lateral on old stems, with short peduncle and several scarious bracts at the base, with up to 6 successive flowers. Flowers are relatively big, with purple nerves; lip with five red nerves. Floral bract is purple, 3 mm. long. Sepals are rigid, with five nerves, fleshy apex, verrucose exterior face; dorsal sepal is 21 mm. long and lateral sepal is 22 mm. long, oblique, concave, fleshy basal portion, 18 mm. long. Column is arched, 9 mm. long, with a conspicuous foot, 4 mm. long; apex with short, lateral teeth and a trifid tooth on the posterior part.

Habitat: Epiphyte, occasionally terrestrial; grows on dispersed trees, between 1200 and 1400 m., around pastures.

Flowering season: April to October.

Observations: Not common, very similar to an *Epidendrum* but the flower is more reminiscent of *Maxillaria*. Seems to like sunny exposure.

Heterotaxis crassifolia

Lindl. 1826

■ **Description:** With shortly oblong pseudobulbs, covered with sheaths with foliar limbs. Pseudobulbs are 3 cm. long, compressed, unifoliate. Leaves are coriaceous, attenuate towards the triangular petiole, with an obliquely retuse apex, dorsally carinate, up to 40 cm. long, deeply channeled. Peduncle is 1 cm. long; Inflorescence is unifloral from the axils of the sheaths. Flowers are pale yellow, rarely open, generally cleistogamous. Floral bract is tight, 5 mm. long. Sepals are rigid, with fleshy, acute apex, 13 to 18 mm. long; laterals are oblique. Petals are erect, thinner than the sepals, oblanceolate, acute; slightly erose apex, 10 to 15 mm. long. Lip is inconspicuously trilobed above the middle, erect and parallel to the column; intermediate lobe is obovate, with round apex, 10 to 12 mm. long, fleshy and rigid, papillose; disc with a linear-spatulate callus from the base to above the middle; another callus that is elliptic and less elevated covers almost all the surface of the intermediate lobe. Column is arched, nailed, 7 mm. long, with a very short foot.

Habitat: Epiphyte; grows on latifoliate wet forest, from sea level to 1200 m.

Flowering season: December to February.

Observations: Leaves are very distinct and join as in *M. valenzuelana*, but leaves are less wide and flat than the latter. *M. crassifolia* flourishes in cultivation without direct sunlight.

Heterotaxis discolor

(Lodd. ex. Lindl.) Ojeda & Carnevali 2005

■ **Description:** With compressed pseudobulbs, completely covered with wide sheaths with foliar limbs, unifoliate, 4.5 cm. long, slightly purple. Leaves are nerved, with a conspicuous retuse apex, articulate with sheaths, underside is purple, upper-side is olive green, carinae, with a conduplicate 3 cm. petiole;

blade is 20 cm. long. Inflorescence is unifloral from the axils of the sheaths, 6 cm. long, including the maculate and 1.5 cm. long peduncle, with a 2 cm. sheath at the base, maculate and translucent. Flowers are sub-coriaceous, patent, ocreaceous, with a red brown callus and small red patches on the basal half of the lip, both sides of the sepals and the upperside of the petals are furfuraceous. Floral bract is scarious, furfuraceous, 1.5 cm. long, inflated. Sepals are acute, apiculate, with a fleshy greenish apex, 20 mm. long; lateral sepal is oblique. Petals are acute, attenuate towards the base, 16 mm. long. Lip is trilobed near the middle, 14 mm. long; lateral lobes are erect, rounded, with curved edges, glabrous; intermediate lobe is fleshy, obtuse, 2 mm. wide at the base; disc with an elevated callus, spatulate, tuberculate from the base to the base of the intermediate lobe, another callus along the center of the intermediate lobe. Column is rigid, arched, 1 cm. long.

Habitat: Epiphyte in rainforest on the Atlantic slope.

Flowering season: October.

Observations: We have not seen this species; information from Hamer (2001).

Heterotaxis maleolens

(Schlechter) Ojeda & Carnevali 2005

■ **Description:** Erect, caespitose, robust, up to 45 cm. tall. Rhizome is almost obsolete. Pseudobulbs are unifoliate, 8 cm. long, compressed, young bulbs are glabrous, old ones are rugose. Leaves are up to 40 cm. long, with a short petiole, conduplicate, apex is obliquely retuse and with erose edges, dorsally carinate. Inflorescence is unifloral, from the axils of the sheaths, with a robust 3.5 cm. penduncle, covered with two sheaths. Flowers are bell-shaped; sepals, petals, column and lip are yellow; lip with an apical lobe is red, lateral lobes have short red stripes over an orange-yellowish base. Floral bract is 1.5 cm. long, glandular. Sepals and petals with a concave lower half, the apical half is convex, curved edges; sepals are coriaceous, thick, covered with small and brown scales; dorsal sepal is elliptic, acute, 2 cm. long; lateral sepal is acute, oblique, 2 cm. long, with a conspicuous chin. Petals are thinner than the sepals, obliquely spatulate. Lip is erect, parallel to the column, with lateral lobes surrounding the column, 18 mm. long; intermediate lobe is 6 mm. long, verrucose, with a fleshy apex; disc with a red callus, intermediate lobe with another yellow callus, oblong. Column is arched, sulcate, 1.5 cm. long, with a short foot, with a red patch on each side of the rostellum.

Habitat: Epiphyte in rain forests.

Flowering season: April.

Observations: We have seen this species on Costa Rica, but not in Nicaragua.

Heterotaxis valenzuelana

(Nash) Ojeda & Carnevali 2005

■ **Description:** Pendant, up to 40 cm. long, leaves are fleshy, flabelliform and imbricate, up to 40 cm. long, conduplicate near the base, acuminate. Inflorescence is unifloral, with a rigid peduncle which is up to 5 cm. long. Flowers are patent, with

green-yellowish sepals and petals, golden lip with red patches, column, anther and pollinia are white. Sepals are fleshy along the axis, apiculate; dorsal sepal is 10 mm. long; lateral sepal is 14 mm. long. Petals are thin, ligulate, apiculate, 7 mm. long. Lip is lanceolate, sub-obtuse, fleshy, 10 mm. long; disc with a linear callus, from the base to the apex of the lip. Column is short, robust, 4 mm, with a 3 mm. long foot.

Habitat: Epiphyte; Hamer reports it in wet areas, but we have seen it only on dry plains near Jalapa.

Flowering season: October to December.

Observations: Curious plant, grows pendant with leaves facing down on the underside of branches or trunks so that little water reaches it. These are difficult to adapt to cultivation, first they shed the lateral leaves and if they survive, they grow slowly with new leaves from the center but without flowering.

Homalopetalum pumilio

(Reichembach) 1844

■ **Description:** Creeping rhizome, unifoliate pseudobulbs, 4 to 5 mm. long, covered with scarious sheaths. Leaves are erect, 10 to 15 mm. long. Peduncle is filiform, 10 to 15 cm. long and covered with 2 or to 3 tubular sheaths, with solitary flowers. Flowers are big for the plant, pale green, with purple spots and a 6 mm. long ovary, and a tubular floral bract. Sepals and petals are patent, curved, similar in shape and dimensions, both are elongate, acuminate, 25 mm. long. Lip is sharply acute, 18 mm. long; disc with two short carinae elevated on each side of the base. Column is 6 mm. long.

Habitat: Epiphyte in tropical rain forests.

Flowering season: September.

Observations: We have not seen this species; information from Hamer (2001).

Houlettia tigrina

Linden ex. Lindl. & Paxton 1853

■ **Description:** Caespitose, up to 45 cm. tall. Pseudobulbs are conical, contracted in a periform neck, 3 cm. long, unifoliate, covered with long, acuminate sheaths, up to 7 cm. long. Leaves are shortly acuminate, with seven prominent nerves, blade to 30 cm. long, rigid and erect petiole, 8 cm. long. Inflorescence in raceme, reddish peduncle, 8 cm. long, covered with several tight sheaths. Flowers are patent, big and showy; sepals with red spots on a yellow-reddish background; petals are dark red on a yellowish background; lip is white with brown-red spots, 1 to 1.5 cm. long. Sepals are deeply concave obtuse, 5 cm. long; dorsal sepal is elliptic, 24 mm. wide; lateral sepal is oblique, connate by 5 mm. long. Petals are oblique, with an acute and conduplicate apex; posterior edges with a acute triangular lobe, 4 cm. long. Lip is 4 cm. long, with a short fleshy 10 mm. nail; disc is tuberculate, with two elliptic calli on the nail and two lunar, marginal calli at the base of the hypochyle. Column is semi-nailed, apical portion is winged, the rest is, 3.2 cm. long with a 5 mm. long foot, tridentate apex.

Habitat: Epiphyte in cloud forest.

Flowering season: July to November.

Observations: Similar to a *Stanhopea* leaves with more nerves than normal *Stanhopea*. Not common, even though we have found small plants a couple of times.

Huntleya burtii

(Endres & Reichembach f.) Pfitzer 1889

■ **Description:** Without pseudobulbs, leaves are plicate, flabelliform. Inflorescence is erect, unifloral, from the axil of the central leaf. Flowers are long and showy. Sepals are red-brown with yellow spots, wavy edges, basal portions are white or pale yellow, lateral sepal is connate at the base; dorsal sepal is 4 to 5 cm. long; lateral sepals are 5 to 6 cm. long. Petals are fleshy, patent, similarly colored to the sepals with purple spots or stripe on the basal portions, wavy edges, 4 to 5 cm. long. Lip is fleshy, 3 cm. long, the base is yellow or white, apical half is red-brown or shiny brown-purple, the base is abruptly contracted, forming a conspicuous nail with a basal callus and a semicircular crest. Column is erect, with wide lateral wings forming a cuculla.

Flowering season: July and August.

Observations: Requires abundant moisture and adapts to the lower altitudes, but roots have to be humid and leaves without direct sunlight. The axial flowers are showy, easily recognized even though the color and texture of the flower can vary a little.

Ionopsis satyroides

(Sw) Lindl 1823

■ **Description:** 1 cm. long pseudobulb, brown-purple, compressed, surcate, in general without leaves or with an only flower, covered with sheaths that have foliar limbs. Leaves or foliar limbs are coriaceous, thick, surcate, longitudinally obtuse., 10 cm. long, dark purple to green. Inflorescence is lateral, multi flower panicle, green-purple with light brown sheaths, up to 15 cm. long. Flowers are small, white, with pedicel ovary, 5 mm long. Petals are 4 mm long; laterals are connate to the middle, with three longitudinal violet lines. Lip white with yellow base, 8 mm long, lamina is deeply marginate and; disc at the base with two laminae calli, 2 mm long, white. Column is 2 mm long, thick, green and dilated towards the apex.

Habitat: Epiphyte; grows on semi-arid lands low along rivers; on guava and citrus tree.

Flowering season: January to April

Observations: Small inconspicuous plants less common than *I. utricularoides*, just recently reported for Nicaragua by Fabricio Diaz (2008).

Ionopsis utricularoides

(Sw) 1821

■ **Description:** 1.5 cm. long pseudobulb, brown-purple, compressed, surcate, covered with sheaths that have foliar limbs. Leaves or foliar limbs are coriaceous, thick, surcate, longitudinally obtuse and cusped, 16 cm. long, dark purple. Inflorescence is lateral, multifloral panicle, green-purple with light

brown sheaths, up to 50 cm. long. Flowers are small, white, with a tinge of pink-violet, with pedicel ovary, 5 mm. long. Sepals are 4 mm. long; laterals are connate to the middle, with a red-violet central nerve. Lip is shortly unguiculate, 10 mm. long, lamina is deeply margined and with a red-violet nerve; disc at the base with two bladelike 2mm. long white calli, Column is 2 mm. long, thick, green and dilated towards the apex.

Habitat: Epiphyte; grows on semi-arid low lands along rivers; on guava and citrus trees.

Flowering season: January to April

Observations: Relatively short lived, apparently die if capsules mature so it is a good idea to take off the capsules to promote a longer life.

Isochilus aurantiacus

Hamer & Garay 1981

■ **Description:** Up to 30 cm. tall. Secondary stems are thin, covered with verrucose sheaths, foliar in the superior portions. Leaves are 40 mm. long with an obliquely retuse apex. Inflorescence with 3 to 4 dictic flowers, raceme is up to 3 cm. long, including the 1 cm. long peduncle. Flowers are slightly fleshy, orange to reddish orange. Floral bract is variable in size, the inferior bracts 12 mm. long, with the basal portion attenuate in two third apical parts; the superiors are 5 mm. long, shortly acuminate. Sepals are connate in the basal half, with apicule and conduplicate apices, 5 nerves and 9 mm. long; lateral sepals are strongly carinate. Petals are oblique with an acute and conduplicate apex, 5 nerves, 9 mm. long and erose edges. Lip is spatulate, with a long nail, contracted towards an obtuse apex, 11 mm. long; disc with a verrucose callus. Column is thin, arched, and with a tridentate apex.

Habitat: Epiphyte; grows in forests canopy and exposed trunks between 1000 and 1500 m.

Flowering season: December to January and May to June

Observations: The smallest of the Nicaraguan *Isochilus*, and the orange flower makes it easier to recognize.

Isochilus florus carnosus

Lindley 1844

■ **Description:** Short rhizome, up to 30 cm. tall. Secondary stems are thin, foliose, covered with verrucose sheaths. Leaves are obliquely retuse at the apex, up to 40 mm. long, dorsally carinate. Inflorescence is unilateral, it has up to 4 flowers with a 5 mm. long peduncle. Flowers with pink- carmine sepals, petals are more pale, lip is white with two big red-violet spots on the middle, a truncate, retuse apex and an apicule on the sinus; basal half is verrucose. Sepal with 5 nerves, connate up to above the middle, conspicuously carinate, 8 mm. long. Petals with 5 nerves, rounded obtuse apex, 7 mm. long. Lip is 9 mm. long, arched in natural position, with an erect nail, slightly contracted in the apical half. Column is thin, 5 mm. long, with three apical teeth.

Habitat: Epiphyte; in cloud forests canopy as well as lowland rain forest.

Flowering season: September to January.

Observations: Recognizable by two red spots on the lip.

Isochilus chiriquensis

Schlechter 1922

■ **Description:** Patent to pendant, growing in compact masses, caespitose, up to 40 cm. tall. Stem is thin and foliar. Leaves are linear, 4 to 6 cm. long, membranous, obliquely retuse on the apex, articulate with glabrous nerved sheaths. Inflorescence is erect, unilateral, raceme with 10 to 20 flowers, very short peduncle. Flowers are pink-purple, partially hidden by the sheaths; lip is white with 2 dark red-brown spots on the apical lip. Floral bract is carinate, with a small apicule on the contracted apex, up to 11 mm. long. Sepals are 10 mm. long; lateral sepal is oblique, joined at the base to form a short chin with the apex of the column. Petals with a short nail, acute, 9 mm. long. Lip with a sacciform nail, contracted over the middle forming an apical lobe with five nerves and 10 mm. long. Column is thin, 7 mm., with a short foot and a tridentate apex; anther is erect, ciliated at the base.

Habitat: Epiphyte on trees or rocks at approximately 900 to 1500 m.; also grows in coffee plantations and closed forest.

Flowering season: August.

Observations: Canopy and isolated trees in areas near natural forest, not very conspicuous while not in flower.

Isochilus latibracteatus

A. Rich & Gal 184

■ **Description:** Creeping rhizome, numerous secondary stems, erect, 30 cm. long, covered with brown sheaths, verrucose, especially in the basal sheaths, with foliar limbs. Leaves are distic, linear, erect, leaves in the apical portion progressively shorter and tighter against the stem, 32 mm. long, articulate with sheaths, obtuse marginal green carinae. Inflorescence in terminal raceme with 5 to 10 flowers. Flowers are unilateral, brown-violet, pedicel ovary is completely covered with wide bracts. Sepals are 9 mm. long, dorsally carinate, red-violet. Petals are 8 mm. long, same color as the sepals; lip with the base have an "S" shape, whitish, 9 mm. long. Column is 6 mm. long, with a short foot, dilated and bidentate apex.

Habitat: Epiphyte in cloud forest.

Flowering season: May, June.

Observations: This is the commonest *Isochilus* in Matagalpa and Jinotega where it grows on roadside trees.

Isochilus linearis

(Jacq) 1798

■ **Description:** Caespitose, up to 30 cm. tall, primary stems are creeping and thickened. Secondary stems are erect, covered with verrucose sheaths. Leaves are linear with a retuse apex, apicule on the sinus, articulate with sheaths, 3.5 to 4 cm. long. Inflorescence in raceme, more or less unilateral, 2 cm. long, three to six flowers, all flowers open at the same time; short peduncle. Flowers are carmine, with carmine floral bracts. Sepals

with five nerves, 9.5 mm. long; dorsal sepal is connate to the lateral sepals for one fourth of their length; lateral sepals form a bifid chin on the carmine base; dorsal sepal is 4 mm. wide. Petals are spatulate, with five nerves, 9 mm. long; the nail is 1 mm. wide at the base. Lip with curved and wavy edges, slightly concave, 9 mm. long, with two dark spots near the contracted apical third. Column is thin, erect, 6.5 mm. long; apical portion is slightly winged, with a trilobed apex, and two lateral lobes that are longer than the intermediate lobe, with an acute tooth on the anterior edge.

Habitat: Epiphyte; in cloud forest.

Flowering season: March to July.

Observations: Inconspicuous in the same habitat as *I. latebricreatus* but uncommon in Nicaragua,

Isochilus major

Cham & Schlechter 1831

■ **Description:** Caespitose, up to 50 cm. tall. Secondary stems are arched to pendant, yellow-greenish, foliar in the apical portion; terminal leaves have the same pink color as the flowers, plain sheaths. Leaves with a truncate apex, obliquely patent, 5 to 7 mm. long. Inflorescence with five to eight flowers in a dense raceme. Flowers are dark pink, lip with a wine-red apex and two dark red spots at the base of the intermediate lobe. Floral bract is pink, elliptic, retuse, 10 mm. long. Sepal is connate to the base, 11.5 mm. long, with a fleshy, conduplicate apex, dorsally carinate. Petals with erose apical edges, five nerves, 9.5 mm. long. Lip is slightly trilobed the beyond the middle, a sigmoid nail, with an orbicular and sacciform base, 10 mm. long; lateral lobes are erect, fleshy, slightly arched in natural position. Column is thin, 7 mm. long, apex with five teeth.

Habitat: Epiphyte; in the cloud forest canopy.

Flowering season: April to August.

Observations: Not common, bigger than other species and apical leaves pink during flowering.

Jacquiniella cobanensis

(Ames & Schlechter) Dressler 1966

■ **Description:** Caespitose, up to 20 cm. tall, obliquely ascendant. Stems are flexible, covered with tubular, maculate, grooved sheaths. Generally 5 leaves, distic, articulate with sheaths, ascendant, fleshy, surcate. Inflorescence with a solitary flower from the spathe of the superior leaf. Sepals, petals, and lip are reflexed and fleshy, patent; color yellow, brown-orange, to purple. Two floral bracts, similar to spathes, scarious, 15 to 20 mm. long. Sepals in the apical half are dorsally carinate, 12 mm. long. Petals with three nerves, 10 mm. long, the apical half is very fleshy forming a 90° angle with the basal half. Lip is adnate to the base of the column, trilobed in the middle, 15 mm. long; lateral lobes are 6 mm. long; intermediate lobe is fleshy, transversely rugose, 7 mm. long; obtuse apex; disc is concave with three calli beneath the column. Column is thin, fleshy, 6 mm. long.

Habitat: Epiphyte in cloud forest canopy and trunks of isolated trees 1000 m. & .

Flowering season: Irregular throughout the year.

Observations: Plants are more robust, with bigger leaves than other species. Flowers open well, but produce few.

Jacquiniella equitantifolia

(Ames) 1923

■ **Description:** Up to 40 cm. tall, generally pendant, with thick rhizome. Stems are laterally compressed, covered with sheaths, attenuate towards the base, expanding upwards. Peduncle is up to 15 cm. long, shorter than a leaf, covered with a very compressed and obliquely acute sheaths. Leaves are sessile, dictic, imbricate, up to 20 cm. long, with an acuminate apex. Inflorescence is terminal in the peduncle sheath. Up to three successive flowers; sepals and petals are olive brown, lip and column are yellow. Floral bract is brown, scarious, up to 1 cm. long. Sepals are concave, up to 13 mm. long; dorsal sepal is 3.8 mm. wide; lateral sepal is 3.3 mm. wide, acute. Petals are oblique, 10 mm. long. Lip is fleshy, trilobed near the middle with erect lateral lobes, hiding the apex of the column; winged nail is adnate to the middle of the column; intermediate lobe is very fleshy and makes a 90° angle with the column; disc with an elevated trifid callus at the base on the blade and up to the base of the intermediate lobe. Column is sigmoidal, with an elongated stigma, 10 mm. long, with three teeth at the apex.

Habitat: Epiphyte; cloud forest at 1200-1500 m., grows on big trunks in shade.

Flowering season: Several times a year, mainly in August.

Observations: flowers are cleistogamous, rarely opening well, the plant habit looks more like a *Lockhartia* than a *Jacquiniella*.

Jacquiniella glóbulosa

(Jacq) 1763

■ **Description:** Erect or ascendant. Secondary stem is thin, covered with foliar sheaths. Leaves are dictic, acute and obliquely obtuse at the apex, slightly furrowed, interior articulates with sheaths, up to 25 mm. long. Floral bract is imbricate, up to 1.5 mm. long. Flowers are solitary on the apical fascicle, of the secondary stems. Sepals are connate at the base, concave, thickened and fleshy on the apices, yellowish with red spots, 3 mm. long. Petals are slightly concave, elliptic, uninerved, 2.5 mm. long. Lip is fleshy, rigid, 3 mm. long, concave, simple, slightly contracted underneath the middle, apex with a conspicuous apicule, fleshy and acute. Column is erect, slightly dilated in the apical portion, 1.4 mm. long.

Habitat: Epiphyte; in wet forest from sea level to 1100 m.

Flowering season: Irregular all year.

Observations: The smallest representative of this genus in Nicaragua, with shorter foliage, darker than other species, and small flowers. Locally common, but we have not seen it form large plants.

Jacquiniella teretefolia

(Sw.) Britton & Wilson 1926

■ **Description:** Terete secondary stems, 25 cm. long, covered

with sheaths, with foliar limbs on the apical portions. Leaves are 3 cm. long, fleshy, rigid, dictic, surcate. Inflorescence is terminal, with one flower; peduncle is long and thin, 5 cm. long. Flowers are green-yellowish, fleshy, 9 mm. long, cleistogamous. Sepals are 9 mm. long, green-yellowish; fleshy apex. Petals are 5.5 mm. long, same color as sepals, thickened apex. Lip is 6 mm. long, fleshy, adnate to the base of the column, trilobed; lateral lobes are thin, surrounding the column; intermediate lobe is very fleshy, triangular or rhombic, green-yellowish; disc with a longitudinal carina. Column is 4 mm. long, green, winged at the apex.

Habitat: Epiphyte in the canopy of cloud forest and on trunks at 800 m. or more.

Flowering season: September and October.

Observations: Cleistogamous flowers; very common in Matagalpa and Jinotega; requires abundant sunlight and dies rapidly when it falls to the ground.

Kefersteinia costarricensis

Schlechter 1918

■ **Description:** Cespitose, up to 15 cm. tall, with flexible roots, without pseudobulbs. Leaves are plicate, acuminate, to 14 cm. long, wavy edges and conduplicate petiole. Inflorescence is solitary, from the leaf axil. Flowers are showy, fleshy, patent, white with violet spots on the lip and petals. Sepals are concave; dorsal sepal is 11 mm. long, acute and lateral sepal is oblique, 15 mm. long. Petals are obliquely lanceolate, 10 mm. long. Lip is erect and almost parallel to the column in natural position, contracted towards the apex giving the impression of being trilobed; apical portion is contracted, curved, truncate, with erose edges, 10 mm. long; disc with a forked callus above the nearly obsolete nail; callus is fleshy, surcate, rectangular, 2.5 mm. long. Column is triangular, trapezoidal, with an arched foot.

Habitat: Epiphyte in cloud forest.

Flowering season: May, August, December, January.

Observations: We have found it once in Nicaragua at 500 m. on a small branch that was 1 m above the ground in a dense forest. This plant is very fragile and very inconspicuous, rather like a small *Huntleya* – it adapted very well to being potted where it flowers intermittently almost all year.

Kegeliella atropilosa

L.O. Williams & Heller 1964

■ **Description:** Creeping, up to 20 cm. tall. Pseudobulbs are aggregated, slightly compressed, trifoliate, with two acuminate and maculate sheaths at the base five carinate nerves, 7 to 9 cm. long, contracted at the base in a short, conduplicate petiole. Lateral Inflorescence, pendant, simple raceme with one to few flowers; rachis is thin, covered with a black-purple pubescence. Floral bract is slightly pilose and acute. Flowers are green-whitish, sepals and petals with red, transverse stripe; lip is yellowish with red spots on each side of the callus; column is darker. Dorsal sepal is 17 mm. long, shortly acuminate, dorsally black; lateral sepal is free towards the base, similar to dorsal sepal. Petals

are 12 mm. long, acute. Lip is 8 mm. long, trilobed; lateral lobes are suberect, rounded, 4 mm. long; apical lobe is sub-cordiform, as long as wide; disc with a short callus, surcate, from near the base to the middle of the lip, approximately, 6 mm. long and 2.5 mm. wide near the apex, attenuate towards the base.

Habitat: Epiphyte; grows at 900-1300 in cloud forest, on trunks of giant ferns in shade.

Flowering season: September.

Observations: Being a small plant, it requires abundant humidity to maintain it out of its habitat. Uncommon, isolated small plants. We have found old plants with up to a dozen of pseudobulbs, but always small.

Kionophyton pyramidalis

(Lindley) 1980

■ **Description:** 60 cm. tall, without leaves during the flowering season. Stems are brown-reddish, sheaths have the same color, up to 6 cm. long. Inflorescence erect, thin, up to 10 cm. long, with up to 40 flowers from which six to eight open at the same time. Flowers are white in the upper floral segments and brown-green in the inferior portions. Floral bract is acuminate, 10 mm. long, pink. Sepals with pilose tubers near the exterior base; dorsal sepal is reflexed, 7 mm. long; lateral sepal joined to the bases forming a prominent angle with the foot of the column, 7 mm. long. Petals are acute, 5 mm. long. Lip is arched in natural position, with an orbicular and sacciform nail, 6 mm. long; disc with two lateral calli which are orbicular proximal to the contraction, pillose, ciliated, with five green-brown nerves. Column is short, 4 mm. long, with cilia on the anterior face.

Habitat: Terrestrial or lithophilie; in hot areas.

Flowering season: January to March.

Observations: We have not seen this species; information from Hamer (2001).

Lacaena bicolor

Lindley 1843

■ **Description:** Up to 70 cm. tall, pendant raceme that is up to 60 cm. long. Pseudobulbs are up to 10 cm. Peduncle with several inflated sheaths, scarious, apiculate, 2 to 3.5 cm. long. Generally for leaves on the apex of the pseudobulb, plicate, acute, 30 to 45 cm. long, with five prominent nerves on the inside. Inflorescence is pendant from the base of the pseudobulb, 25 to 60 cm. long, with up to 50 flowers. Floral bract is acute; flowers are patent, fleshy, cream-yellowish with conspicuous, brown-violet spots on the intermediate lobe. Sepals are externally furfuraceous along the center, concave, with an acute conduplicate apex, curved edges; dorsal sepal is 2 to 2.5 cm. long; lateral sepals are dorsally carinate at the apex, 2.3 to 3 cm. long. Petals are concave, with an acute and somewhat dentate apex, 17.5 mm. long. Lip is up to 2.5 mm. long, with erect lateral lobes and a rounded apex; apical lobe is cordiform, 15 mm. long, apiculate; disc of the intermediate lobe is covered with short hairs; between the lateral lobes is a conspicuous and oblong callus, a smaller callus grows on the isthmus.

Habitat: Epiphyte; on the upper edge of the pine belt, cloud forest and mossy rocks.

Flowering season: June to July.

Observations: We have not seen the plant flowering, plants in cultivation grow slowly, in our experience regress over time and tend not to flower.

Lacaena spectabilis

(Klotzsch) 1853

■ **Description:** Up to 35 cm. tall, pendant Inflorescence, up to 50 cm. long. Pseudobulbs are laterally compressed, up to 7 cm. tall near the base. Leaves are elliptic, acute or acuminate, with three conspicuous nerves, 25 to 30 cm. long. Inflorescence is lateral, pendant, raceme, with 15 to 25 flowers. Flowers are whitish, sepals and petals have pale purple spots, especially on the apices and along the nerves. Sepals are elliptic, acute, with multiple nerves, fleshy, 2.3 to 3 cm. long. Petals 2 cm. long connate at the column bases, Lip is trilobed and fleshy; base is short with inconspicuous auricles on either side, of the base of the column, 2 to 2.5 cm. long; disc with a callus from near the base to the isthmus; lateral lobes are rounded, erect; intermediate lobe is unguiculate, 1 cm. long; nail is short, channeled downwards. Column is arched, conspicuously winged towards the apex, 2 cm. long.

Habitat: Epiphyte or terrestrial; grows in semi-dry, wet, and rain forests.

Flowering season: May.

Observations: Pseudobulbs are more robust, shorter and heavier than *Lacaena bicolor*. Also present in lower, hotter and drier areas. Sometimes grows as big plants. The only one we have seen flowering (see picture) appears to be a new species (*Dressler pers. comm.*) out fits description of synonym *L. nica-raguense* (*Gerdach pers. comm.*) and requires further study.

Laelia rubescens

Lindley 1840

■ **Description:** Up to 70 cm. tall. Pseudobulbs are compressed, orbicular, 7 cm. long, unifoliate. Leaves are shortly petiolate, up to 15 cm. long, with retuse apex. Floral spathe is elongated, covered with three tight sheaths, raceme with several flowers. Flowers are white to pink with stert spots in the dark purple throat. Floral bract is acuminate, 7 mm. long. Sepals are sub-acute, 3.8 cm. long. Petals are elliptic, obtuse, 3.8 cm. long. Lip is trilobed near the middle, 3 cm. long; lateral lobes are labriform, obtuse, curved and surrounding the column; intermediate lobe is retuse; disc with two parallel lamina from the base to the base of the intermediate lobe. Column is purple and 10 mm. long

Habitat: Epiphyte; on jicaro trees, sometimes on rocks, more common in low altitude dry tropical forest.

Flowering season: November to January.

Observations: Very common near the big lakes, in pastures where jicaros grow which can be densely covered. Flowers are

showy in December-January, the *alba* form is less common amid populations of the normal form, with a white flower and a yellow neck.

Laelia superbiens

(Lindley) 1840

■ **Description:** With bifoliate pseudobulbs, 25 cm., attenuate towards the base and the apex, covered with several scarious sheaths. Leaves are coriaceous, 30 cm., carinate, green. Terminal Inflorescence, peduncle is 1.50 m., completely covered with scarious sheaths, multifloral raceme with up to 15 flowers. Flowers are very showy, red violet; floral bract is brown 8 cm.; sepals and petals are 65 mm., red violet; lateral sepals connate to the bases; petals with slightly wavy margin. Lip is 5 cm., trilobed; lateral lobes are curved, outside is green-yellowish with red violet margin; intermediate lobe is 2 cm., red violet; from the base to the middle of the intermediate lobe is a wide and yellow callus with purple longitudinal stripes ending in five raised lamina with purple margin. Column is 3.5 cm., arched, yellow with purple.

Habitat: Epiphyte on oak, sometimes lithophytic under sunlight on oak trunks, 1000-1300 m.

Flowering season: November to January.

Observations: This species grows in a climate with extensive temperature variation in full sun where it sometimes forms very large plants.

Lemboglossum cordatum

(Lindley) 1838

■ **Description:** To 90 cm. tall, roots along the rhizome. Pseudobulbs are plain, oblong, compressed, with a truncate apex, up to 7 cm. long, unifoliate. Leaves are acute, with the basal portion conspicuously conduplicate. Inflorescence from the base of the pseudobulbs with a peduncle that is up to 30 cm. long, partially covered with five or more compressed carinate 5 cm. long sheaths. Peduncle is compressed; rachis is up to 20 cm. long with six to eight flowers. Flowers are patent, with yellowish sepals and petals, with red-brown spots; lip is white with similar spots but with a brown-violet callus; column is white. Floral bract is 3.5 cm. long; sepals are 4 cm. long, attenuate or caudate towards the apex; dorsal sepal is 6 mm. wide; lateral sepal is slightly oblique, 5 mm. wide. Petals are attenuate 30 mm. long. Lip is slightly mobile, with a short linear nail, 5 mm. long that joins a laminar nail the same length, decorated with a callus; lamina is cordiform, attenuate, with a strongly reflexed apex; disc with a pair of dolariform keels, 3.5 mm. long, another callus extends from these keels beyond the lateral lobes, making a fleshy callus with a bifid apex, 4 mm. long. Column is thin and erect, dilated towards the apex, forming wings; rostellum with a depression.

Habitat: Epiphyte in wet areas.

Flowering season: May

Observations: We have not seen this species; information from Hamer (2001).

Lemboglossum rossii

(Lindley) 1838

■ **Description:** Compressed pseudobulbs, 3 cm. long, green to slightly purple or brown, unifoliate. Leaves are acute, conduplicate at the bases, green with white veins, very conspicuous. Lateral inflorescence, 10 to 15 cm. long, raceme with 2 to 4 showy flowers. Flower diameter 5 cm.; sepals are 32 mm. long, carinate, pink with brown-reddish spots from the base to the apex. Petals are 30 mm. long, white or pink with few spots on the basal portion. Lip, 3 cm. long, with crenulate- wavy edges; lamina is white with rounded apex; nail has a callus with 2 erect yellow wings. Column is pink, dilated in the apical portion.

Habitat: Epiphyte; in cloud forest.

Flowering season: Not reported.

Observations: We have not seen this species, information from Hamer (2001).

Leochilus johnstonii

Ames & Correll 1943

■ **Description:** Up to 5 cm. tall. Pseudobulbs are very small, up to 8 mm. long, slightly compressed, unifoliate, partially hidden by sheaths with foliar limbs. Leaves are coriaceous, canaliculate, abruptly attenuate up to a conduplicate apex and a short conduplicate petiole, light green, 4 cm. long. Inflorescence from the base of the sheaths, 3 cm. long, with 6 mm. long sheaths, 1 to 3 flowers. Flowers are small, yellowish, with a green column. Floral bract is acuminate, 3 mm. long. Sepals are uni-nerved with an acute and conduplicate apex, dorsally conspicuously carinate; dorsal sepal is 4.8 mm. long; lateral sepal is free to its bases, oblique, 4.8 mm. long. Petals are dorsally carinate, oblique, 4.4 mm. long. Lip is oblong with a very short and sacciform nail, truncate apex, 3 mm. long; disc with a glandular and surcate callus from the nail to the middle of the lip. Column is robust, 4 mm. long, with a short appendage, laterally rounded near the middle.

Habitat: Epiphyte; in wet areas.

Flowering season: February to May.

Observations: We have not seen this species; information from Hamer (2001).

Leochilus labiatus

(Sw.) 1788

■ **Description:** Up to 15 cm. tall. Pseudobulbs are aggregated, globose to ovate, compressed, unifoliate, 6 to 10 mm. long, covered with several scarious sheaths that have foliar limbs. Leaves are up to 4.5 cm. long. Racemose paucifloral inflorescence, peduncle is sometimes branched, with acuminate sheaths. Floral bract is lanceolate, acuminate, 3 mm. long. Flowers are patent, yellowish with red spots on petals and sepals, on the callus and column. Sepals are elliptic, trinerved; dorsal sepal is cucullate, obtuse, 6 mm. long; lateral sepal is connate up to the middle, 5 mm. long. Petals are slightly concave, obtuse, oblique, 5.4 mm. long. Lip is arched in natural position, forming a 90° angle, rounded and slightly retuse apex, 8 mm. long, with a fleshy and

excavated nail; disc with a trifid-triangular callus over the base of the nail which joins two big calli extending to the middle of the lip. Column dentate with two lateral arms near the middle.

Habitat: Epiphyte; at low elevation.

Flowering season: November to February.

Observations: Locally common from sea level to 800 m., wet to dry areas. Short lived on branches. They appear to die after producing capsules.

Leochilus scriptus
(Scheidw.) 1843

■ **Description:** Up to 12 cm. tall. Psedobulbs are compressed, unifoliate, green, up to 3 cm. long, covered with two sheaths, with a foliar limb. Leaves with an acute conduplicate apex, sessile base, dorsally carinate, up to 7 cm. long. Inflorescence up to 20 cm. long, with 3 to 8 flowers; peduncle is thin, sometimes branched, with a green yellowish sheath at the base. Flowers are green yellowish with red violet spots on the lip and along the central nerve of the underside of the sepals and petals. Floral bract is 2 mm. long; acute sepal; dorsal sepal is arched, forming a cuculla on the column, concave, 9 mm. long; lateral sepal is oblique, with curved edges, dorsally carinate, 10 mm. long. Petals are acute, 9 mm. long. Lip is adnate to the column, arched at the base, patent above, cuneate, bilobed on the apex, 10 mm. long; disc with a sacciform basal callus, pubescent inside, followed by a sub-quadrate callus, sulcate, 3 mm. long. Column is short, rigid, with a thin arm on each side of the central portion.

Habitat: Epiphyte; on Guayacán and citrus branches, premontane forest.

Flowering season: October to January.

Observations: This *Leochilus* is very big for the genus and almost looks like a *Maxillaria*. Delicate plant with a short life span that requires live branches often dies after flowering.

Lepanthes acuminata
Schlechter 1912

■ **Description:** Secondary stems are thin, 4 to 6 cm. long, finely ciliated and covered with dilated and ciliated sheaths; unifoliate. Leaves are elliptic, up to 3.5 cm. long, green with visible longitudinal nerves, acuminate and tridentate at the apex. Inflorescence is thin, behind the leaf, with a filiform peduncle. Flowers are relatively big for the genus, 1.5 cm. long, yellowish with few red spots on petals and lip. Dorsal sepal is 7 mm. long, largely acuminate, lanceolate, trinerved, yellowish-greenish; lateral sepal joined at the base. Petals are transversely bilobed, lobes are orbicular and rounded, yellowish-reddish, 2.5 mm. wide. Lip is reddish, fleshy, bilobed, with lobes surrounding the column. Column is thin and reddish.

Habitat: Epiphyte in cloud forest.

Flowering season: November to January.

Observations: Like many *Lepanthes*, it grows in temperate weather and requires abundant humidity, it is hard to grow when transplanted from its natural habitat.

Lepanthes blepharistes
Reichembach 1866

■ **Description:** Cespitose, up to 7 cm. tall. Secondary stems are 1.2 to 5 cm. long, with hispid sheaths. Leaves are 0.8 to 2.5 cm. long with a twisted sulcate petiole, 2.5 mm. long, with a tridentate apex, green on top, green-purple on the underside, with three purple nerves. Racemose inflorescence with dictic flowers. Flowers are successive, with up to 20 flowers in one raceme, with green-reddish sepals; lip is ocreaceous with yellow intermediate lobe; column and anthers are red, anterior lobes of the petals are yellowish, posterior lobes are yellow in the exterior half and red on the interior half. Floral bract is 1 mm. long. Sepals with ciliate edges, acute, with dorsally carinate nerves; dorsal sepal is trinerved, 3 mm. long; lateral sepals joined halfway up, falcate and acute apex, 3 mm. long. Petals are transversely extended in two lobes, finely glandular-papillose, posterior lobe is triangular-lanceolate, falcate, 1.9 mm. long, curved on the column; anterior lobe is acuminate, with curved apex, 1.7 mm. long. Lip is tripartite, slightly longer than the column; lateral lobes are dolabriform, with curved apex; intermediate lobe is linear-erect, glabrous.

Habitat: Epiphyte in wet areas, to 1300 m..

Flowering season: April to June.

Observations: One of the most common *Lepanthes* and the only one found at low elevation in the Atlantic Coast's wet forest.

Lepanthes costaricensis
Schlechter 1923

■ **Description:** Secondary stems are 2 to 7 cm. long, unifoliate and covered with 4 to 5 dilated sheaths, and finely hispid at the apex. Leaves are 30 mm. long, green, obtuse margin and tridentate on the apex. Terminal Inflorescence, filiform, shorter than the leaf. Flowers are distic with pedicel ovary, 4 mm. long and translucent bract. Sepals are 2.5 mm. long, light-green to green-yellowish; lateral sepals are united up to the halves. Petals are 3.5 mm. wide, transversely bilobed, less than 1 mm. long, with finely ciliate edges, orange with reddish spots on the underside. Lip is trilobed, orange-yellowish; edges are finely ciliate, with more intense color; underside is purple; lateral lobes are curved surrounding the column; intermediate lobe is very small and hairy. Column is short and dilated, purple at the base and yellow toward the apex.

Habitat: Epiphyte in cloud forest.

Flowering season: Year-round.

Observations: Grows on fine branches in the canopy where it is not rare, survives with abundant humidity in warmer areas but does not flower much outside its natural habitat.

Lepanthes disticha
(Rich. & Gal) 1845

■ **Description:** Up to 8 cm. tall. Secondary stems are black, up to 4 cm. long, unifoliate, with 4 to 6 sheaths, with slightly hispid nerves and edges. Leaves are shortly elliptic, 3 cm.

long, attenuate towards the apex and base, tridentate at the apex, with an apicule and longer intermediate tooth. Inflorescence with one or two racemes with **loosely** distic flowers, half the length of the leaf. Glabrous flower; sepals are green-yellowish; petals are ocreaceous with brown-red edges; ocreaceous lip; red column. Floral bract is 0.5 mm. long. Sepals are lanceolate, sub-acute, 3 mm; dorsal sepal is 2 mm. wide; lateral sepal is adnate halfway up; lamina is 2.5 mm. wide. Petals are bilobed, with ovate-lanceolate posterior lobe, contracted up to the sub-acute and divergent apex, 2.2 mm. long; anterior lobe is obtuse, curved, 1.5 mm. long. Lip is bilobed, with fleshy lobes, glabrous, sub-acute, 1 mm. long. Column is thin, nailed, 1.5 mm. long.

Habitat: Epiphyte in cloud forest.

Flowering season: March to August.

Observations: Very common in areas more or less exposed to the sun, on branches as on trunks.

Lepanthes edwardsii

Ames 1933

■ **Description:** Cespitose, up to 4 cm. tall, with fleshy roots. Stems are unifoliate, 3 to 15 mm. long. Peduncle is filiform, 1 to 1.4 cm. long with 1 mm. long sheaths halfway up. Leaf with rounded apex, attenuate towards a short 5 to 10 mm. petiole, 5 to 10, the underside is sometimes purple. Inflorescence is simple, flexible, with six to seven successive flowers. Flowers 1.2 to 2 cm. long, variable in size; sepals are yellowish with red patches, especially on nerves and edges; lip is red; petals are orange-yellowish to red, red column. Floral bract is 0.7 mm. long, hyaline and hispid. Sepals are glabrous with conspicuous carinae on the central nerve; dorsal sepal is tri-nerved, acuminate, joined to the lateral sepals of the base, 8 to 11 mm. long; lateral sepals with a conspicuous central nerve and two short laterals, united almost to the apices, leaving two apical tails; lamina is widely ovate. Petals are fleshy, glabrous, oblong, attenuate towards the apices, expanded towards a rounded lobe on the anterior part, 2.5 to 3 cm. long, slightly falcate. Lip is trilobed with lanceolate lateral lobes, fleshy, sulcate above and carinate underneath, 2.8 to 3.5 mm. long, adnate with the lateral sepals; intermediate lobe is very short, linear-acuminate. Column is short, 1 mm. long.

Habitat: Epiphyte in wet areas.

Flowering season: Essentially year-round.

Observations: We have not seen this species in Nicaragua; the image is from a Costa Rican specimen.

Lepanthes eximia

Ames 1923

■ **Description:** 1.5 to 4 cm. tall. Secondary stems are erect, thin, 0.5 to 2.5 cm. long, covered with 3 to 5 tight sheaths, abruptly expanded in an acuminate apex with hispid edges; nerves inconspicuously hispid. Leaf is orbicular to widely ovate-elliptic, 4 to 10 mm. long, underside is finely glandular. Inflorescence in raceme, with two to three successive flowers and a filiform 1.3 to 1.9 cm. peduncle. Flowers are semi-pat-

ent; sepals and column are reddish; lateral lobes of the lip are red; petals and lip are yellow. Floral bract is acute, 0.5 mm. long; pedicel ovary is 1 mm. long. Sepals are 2.2 to 2.5 mm. long, with dorsally carinate nerves, with conspicuous cilia on the carinae and edges; dorsal sepal is 1.3 to 1.8 mm. wide, tri-nerved; two nerved lateral sepals are joined in the middle. Petals are parallel to the column 0.7 to 1.1 mm. long, expanded at the base, forming a semi-orbicular lobe; with obtuse apex. Lip with porrect edges, shortly unguiculate, with rounded lateral lobes; intermediate lobe is deeply retuse and bilobed with the obtuse apices, 1.3 to 1.5 cm. long. Column is trilobed, 3 mm. long, with verrucose carinae.

Habitat: Epiphyte in wet areas.

Flowering season: July to September.

Observations: We have not found this species in Nicaragua; image from Costa Rica.

Lepanthes guanacastensis

Ames & Schweinfurth 1930

■ **Description:** Up to 6 cm. long. Secondary stem is unifoliate, 1.5 to 2 cm. long, with three to four sheaths with hispid edges and nerves. Leaves are ovate, 1.2 to 1.3 cm. long. Inflorescence with 4 to 5 successive flowers in one to two filiform peduncles up to 2 cm. long. Flowers are sub-orbicular, with the cauda of the dorsal sepal and lateral sepals directed forward; yellow sepals, with red nerves; lip, petals and column are red, with ocreaceous apical lobes of the lip. Floral bract is infundibuliform; ovary is 2 mm. long including the 0.8 mm. pedicel. Lateral sepals are adnate for 75% of their length, forming a widely orbicular and forked lamina, 9 mm. wide; dorsal sepal is 7 mm. at the base, 10 mm. long with a linear-triangular, acuminate tail, 6 mm. long. Petals are fleshy, with rounded apex, 1.5 mm. long. Lip is fleshy, trilobed, 2.5 mm. long, with curved apex, obtuse. Column is 1.25 mm. long, with an ovate tongue, yellow underneath the apex sur passing it and a falcate apicule on the interior that extends to the base of the tongue.

Habitat: Epiphyte in wet climate.

Flowering season: July.

Observations: We have not seen this species; information from Hamer (2001).

Lepanthes helleri

Hawkes 1966

■ **Description:** Cespitose, 3 to 7 cm. tall. Secondary stems are thin, unifoliate, covered with 4 to 7 tubular sheaths, black, dilated and acuminate, with hispid nerves and edges. Leaves are orbicular, the longest is 21 mm. long, deeply concave and tubular, with edges touching, abruptly contracted towards the 3 mm. petiole, green to yellowish-greenish, rounded apex and finely retuse. Inflorescences, 1 to 3 per leaf, generally shorter than the leaf, 20 mm. long, with successive flowers. Flowers are patent; sepals are pale greenish-yellowish; lateral lobes of the lip and posterior lobes of the petals are ocreaceous, with red edges; anterior lobe is ocreaceous, the rest of the lip and column are red. Floral bract is ovate, acuminate, verrucose, 1.5 mm. long.

Sepals are uninerved, 2.5 to 2.8 mm. long, acute; lateral sepal is joined up to the middle, 1.5 mm. wide. Petals are bilobed, with a fine apicule on the sinus; surface and edges are finely and densely papillose; anterior lobe is small, triangular, 1.1 mm. long; posterior lobe is widely oblong with an obliquely obtuse apex, 1.5 to 1.8 mm. long. Lip is trilobed, with fleshy lateral lobes, verrucose, falcate, apices converge around the column, 1 mm. long; intermediate lobe is linear, elongated, with tubular and erect cilia near the apex. Column is thin, arched, 1.5 to 2 mm. long, verrucose, especially towards the base.

Habitat: Epiphyte in cloud forest.

Flowering season: Year-round.

Observations: Easy to recognize by its curved, semi-rolled leaves. Common in the canopy and exposed trunks.

Lepanthes johnsonii

Ames 1923

■ **Description:** Cespitose, 2.5 cm. tall, with secondary stems covered with infundibuliforme sheaths, finely hispid edges and carinae. Leaves are elliptic, rounded and retuse on the apex, with an apicule on the sinus. Racemose inflorescence from the base of the leaf, with a bract in the middle and few successive flowers. Flowers with pale red sepals; lip, petals and column are intense carmine. Pedicel ovary is arched, carinate, 1.2 mm. long. Sepals are ovate, lanceolate; dorsal sepal is 4.5 mm. long; lateral sepal is joined 2/3 up the blade, 5 mm. long, shortly acuminate, glabrous and with two nerves; carinate nerves; in general, the flower does not open completely. Petals are oblong, attenuated towards the apex; lobe near the base of the lip is almost obsolete, the whole petal is 2.3 mm. long. Lip is trilobed with two acuminate lateral lobes and a short intermediate lobe. Column is short, less than half the lateral lobes of the lip.

Habitat: Epiphyte in wet areas.

Flowering season: November and December.

Observations: We have not seen this species; information from Hamer (2001).

Lepanthes oreocharis

Schlechter 1912

■ **Description:** Cespitose, up to 8 cm. tall. Secondary stem is almost filiform, covered with 5 to 8 tubular sheaths, dilated and acuminate at the apex, hispid along its entire length but especially on nerves and edges, unifoliate. Leaves are abruptly obtuse on the tridentate apex; upperside is olive green, 3.2 to 3.5 cm. long, slightly dorsally carinate. raceme; Inflorescence, 2 cm. long, including the filiform peduncle, shorter than the leaf, with few successive flowers; sepals and petals are green-yellowish with red nerves on the dorsal sepal and a yellow nerve on the lateral sepals; upper lobe of the petals is carinate, the inferior ones are yellow with a red apex; reddish lip on an orange base; column is pale yellow. Floral bract is thin, 1 mm, with hispidous edges; pedicel ovary is 1.5 mm. long. Sepals are ovate-elliptic; dorsal sepal is 3 to 4 mm. long, trinerved, intermediate nerve is dorsally carinate; lateral sepal with two dorsally carinate nerves, 3 to 4 mm. long, connate to the middle.

Petals are transversely bilobed, 2.5 to 3 mm. wide; posterior lobe is widely oblong, 1 mm. wide, with truncate apex; anterior lobe is obtuse almost half the length and width of the posterior lobe and in a 90° angle with it. Lip is bilobed, 1 mm. long. Column is as long as the lip.

Habitat: Epiphyte in cloud forest.

Flowering season: Unknown.

Observations: We have not seen this species; information from Hamer (2001).

Lepanthes sp.

■ **Description:** 8 cm. tall, stem of the leaf is erect, plain, 35 mm; leaf is dark green, cordate, 15-30 m. m; flowers with rounded sepals, glabrous, red and yellow.

Habitat: Cloud forest, on small trunks, uncommon.

Flowering season: April to September.

Observations: This species seems to be endemic of the Mt. Apante where it grows around the summit above 1200 m. along with *Lepanthes helleri* and *Gongora cassidea*.

Lepanthopsis floripecten

(Reichembach) 1854

■ **Description:** Cespitose. Secondary stems are erect, terete, up to 6 cm. long, covered with dilated sheaths and ciliated edges, unifoliate. Leaves are 35 mm. long, green, margined and bidentate on the apex. Racemose inflorescence with up to 20 flowers, 7 cm. long, including the thin peduncle. Flowers are small, 6 mm. long, sessile, unilateral, light brown or light purple. Sepals are 2.5 mm. long; lateral sepals are connate almost up to the apices, translucent yellow with purple veins. Petals have 0.5 mm. diameter, sub-orbicular, yellow, with complete edges. Lip is 0.7 mm. long, yellow, sessile, with complete edges, the base is somewhat curved. Column is short, wide and yellow.

Habitat: Epiphyte in wet forest.

Flowering season: June.

Observations: We have not seen this species; information from Hamer (2001).

Leucohyle subulata

(Schweinfeld) 1798

■ **Description:** Pendant, up to 25 cm. long, with a very short rhizome. Stem is thin, terete, 2 cm. long, covered with several thin scarious sheaths, 2 mm. in diameter that become fibrous as they dry. Leaves are solitary on the apex of the stem, fleshy, linear, sulcate, semi-terete, acuminate, up to 22 cm. long. Inflorescence with one to several flowers from the base of the stem, with a 4 mm. long peduncle, surrounded with scarious sheaths. Flowers are cream-yellowish; lip has red spots. Floral bract is acute, inflated, 9 mm. long, bracteole with the same length. Sepals are lanceolate, acuminate, 1.6 cm. long; lateral sepal is oblique. Petals have similar size and shape. Lip with lateral edges surrounding the column; apex is abruptly contracted

to a prominent apicule, apical edges are serrate, 1.6 cm. long when flattened; disc with a bifid callus near the base.

Habitat: Epiphyte in rain forest.

Flowering season: November.

Observations: We have not seen this species, information from Hamer (2001).

Liparis arnoglossophylla

Reichembach 1883

■ **Description:** More than 20 cm. tall, with basal leaves and several white sheaths, nerves at the base of the petioles. Leaves with a 7 cm. long blade, abruptly attenuate, wavy edges, wide petiole, 3 to 4 cm. long, surrounding the stem. Inflorescence: rachis is up to 5 cm. long, with a conspicuously triangular peduncle, 10 cm. long, loosely paucifloral. Flowers are dark green. Floral bract is acuminate, up to 6 mm. long. Sepals and petals are sub-equal, 10 mm. long, with revolute edges and obtuse apex; dorsal sepal is 2 mm. long; lateral sepal is similar but more acute at the base and with three nerves; petals are filiform, twisted, 0.5 mm. wide at the base. Lip is ovate-elliptic, the apical portion is slightly serrate, abruptly contracted towards the sub-acute apex, trinerved, with cordiform base; several transverse nerves from the central nerve; disc with a wide callus, reddish from the base to top 1/5 of the lip. Column is dark green, arched with the wide base and nailed apex, 4 mm. long.

Habitat: Terrestrial at the base of tall trees, wet forest.

Flowering season: August.

Observations: We have not seen this species; information from Hamer (2001).

Liparis cordiformis

Schweinfurth 1937

■ **Description:** 12 cm. tall, with small pseudobulbs surrounded by scarious carinate sheaths, that are longer than the pseudobulbs. Floral scape is green, unifoliate, erect. Leaves are green, underneath the middle of the floral scape, cordiform, 5 cm. long, with slightly wavy edges. Racemose inflorescence, filiform, paucifloral, 4 to 6 flowers. Flowers are small, purple, with pediceled ovaries, 12 mm. long. Dorsal sepal is 5 mm. long; lateral sepal is 4 mm. long, purple. Petals are filiform, 4 mm. long, purple. Lip is 3.5 mm. long, dilated towards the center, trilobed on the basal portion, with two basal calli. Column is short, 1.2 mm. long, with a short foot.

Habitat: Terrestrial; wet climate.

Flowering season: August.

Observations: We have not seen this species; information from Hamer (2001).

Liparis nervosa

(Thurenberg) 1784

■ **Description:** Erect, glabrous, up to 50 cm. tall. Rhizome is thickened on the conical pseudobulbs, 3 to 6 cm. long. It has

three to five leaves, plicate, widely oblanceolate, nerved, with wavy edges, 6 to 26 cm. long. Floral scape is up to 40 cm. tall, including the winged peduncle, purple. It has 8 to 10 purple flowers, with green edges on the floral segments. Floral bract is triangular-lanceolate, 3 to 7 mm. long. Sepals are obtuse, edges are strongly revolute, five nerves; dorsal sepal is oblong, 6 to 7 mm. long; lateral sepal is oblique, widely elliptic, 5 to 6 mm. long. Petals with revolute edges forming a tube, 6 to 7 mm. long. Lip is fleshy, retuse, reflexed, 5 to 6 mm. long; disc with a linear-triangular callus, erect. Column 4.2 mm. long, arched, nailed, apical portion attenuate.

Habitat: Terrestrial in pastures and various forest types.

Flowering season: August.

Observations: We have only found this fragile species on a rockfall around 600 m. on Mombacho Volcano. We do not think that the lithophilic substrate is necessarily the preferred one, but rather that this is an area that has not been human disturbance. We are however skeptical that it would persist for long in pastures.

Liparis vexillifera

(Llave & Lex) 1825

■ **Description:** Bulbous, up to 25 cm. tall. Bulbs are ovate, glabrous, 1.5 to 5 cm. long, with a prolongation and glabrous roots, unifoliate. Leaves are erect, acute, attenuated towards the conduplicate base that surrounds the scape, with a dorsal carina, nerved, with revolute edges, 13 cm. long. Inflorescence with an erect spike from the center of the bulb, 22 cm. long, including the 7 cm. long rachis, the basal portion is terete, the apical half with a winged rachis, 10 to 20 flowers. Flowers with yellow sepals and petals; lip with a brown anther. Floral bract is linear-lanceolate, acuminate, 1 to 1.5 cm. long. Sepals and petals are 7 mm. long, with revolute edges; sepals are trinerved, acute; dorsal sepal is 2.6 mm. wide. Petals are obtuse, 1 mm. wide. Lip is 8 mm. long, contracted above the middle, forming a sub-truncate apical portion; edges on the basal portion surround the column; disc with two short erect calli at the base. Column is arched, thin, nailed, with truncate apex.

Habitat: Terrestrial in wet areas.

Flowering season: November,

Observations: We have not seen this species; information from Hamer (2001).

Lockhartia amoena

Endres & Reichembach 1872

■ **Description:** Cespitose, with flat stems, erect to pendant. Leaves are short triangular, sub-acute, leathery, 1.5 to 3.5 cm. long. Inflorescence is short, compact, with few flowers on the panicle. Flowers are relatively big for the genus, with long, thin pedicels covered with conspicuous membranous bracts. Sepals are free, concave, yellow, 5 to 6 mm. long; with reflexed lateral sepals. Petals are yellow, slightly longer than the sepals, naturally curved; intermediate lobe is sub-quadrate, with wavy edges, truncate apex with a long central sinus; basal lobes are

as wide or wider than the apical lobe when flattened; in natural position, lateral edges are very reflexed. Lip is complex, yellow with brown-reddish maculation on the basal portion, approximately 10 mm. long; disc with a linear, truncate, and papillose callus. Column is short with big apical wings.

Habitat: Epiphyte in undisturbed rain forest.

Flowering season: August to December.

Observations: Rare in Nicaragua, we have seen Nicaraguan material from Bosawas; pictures are Costa Rican plants in cultivation. When not flowering, they are similar to a larger version of *L. micrantha*.

Lockhartia hercodonta

Reichembach 1852

■ **Description:** Up to 30 cm. long, erect to pendant. Stems are covered with the leaf bases. Leaves are distic, imbricate, surrounding the stem with their bases, acuminate, up to 40 mm. long, obliquely patent. Inflorescence with two to several successive flowers, from the base of the upper leaves. Floral bract is acuminate, conspicuously carinate, 7 mm. long. Flowers are white with an orange callus and a green cavity. Sepals are apiculate, 5 mm. long; petals are longer than sepals, with a round 6 mm. apex. Lip with slightly wavy edges, 6.5 mm. long; disc more than half covered by a concave fleshy callus ending on a pair of erect fleshy projections, with two fleshy carinae diverging at the base. Column is short, fleshy, 3 mm. long, with triangular and crenulate lateral wings.

Habitat: Epiphyte in cloud forest above 1100 m.

Flowering season: May to September.

Observations: Locally common in undisturbed forest, requires abundant water, difficult to grow outside its natural habitat.

Lockhartia micrantha

Reichembach 1852

■ **Description:** Up to 35 cm. tall, pendant, completely covered with fleshy leaves, imbricate, distic, that diminishes towards the apex. Leaves are obtuse to sub-acute, 20 mm. long, generally very small. Racemose inflorescence, short, pauciflora, up to 3 cm. long, terminal peduncle or from the axil of the superior leaves. Flowers are small for the genus, 7 mm. long, patent, yellow with an orange callus and red patches on the basal portion of the lip, on the column and the callus. Floral bract is cordiform, up to 4 mm. long. Sepals are widely elliptic, concave, apiculate, tri-nerved, 3.5 mm. long; dorsal sepal is 2.6 mm. wide; lateral sepal is 2.4 mm. wide. Petals are sub-acute, with irregular edges, uni-nerved, 3 mm. long. Lip is trilobed near the base, 4 mm. long; intermediate lobe is rhombic, retuse, 3 mm. long; disc with a big callus, excavated at the base, with slightly elevated and verrucose edges, with a trilobed apex; disc with several warts in front of the callus. Column is trilobed, with serrate edges.

Habitat: Epiphyte; in the well-preserved Atlantic forest.

Flowering season: October to February.

Observations: Grows on the main trunk in unintervened wet forest where it can be very common, without direct sunlight.

Lockhartia oerstedii

Reichembach 1852

■ **Description:** Cespitose, erect, completely covered with small and accipital leaves, sessile, distic, imbricate, carinae and sub-erect. Inflorescence from the axil of the upper leaves, unifloral to several flowers with thin peduncles, pendant up to 3.5 cm. long. Flowers are small, shiny yellow, column and upper half of the lip have dark red patches. Sepals are reflexed, concave, 6 to 8 mm. long; petals are truncate, with reflexed lateral edges, 6.5 to 9 mm. long. Lip is complex, with five lobes, apex is trilobed, 1 to 1.4 cm. long; basal lobes are rounded, with wavy edges, revolute; central lobes are widely obtuse and erect; apical lobe is bilobed with sub-orbicular-ovate lobes; disc is decorated with a fleshy callus, quadrate, with about four papillose-corrugated carinae. Column is short, fleshy, 3 to 4 mm. long.

Habitat: Epiphyte in warm tropical rain forest.

Flowering season: May - June

Observations: We have not seen this species; information from Hamer (2001).

Lockhartia pittieri

Schlechter 1913

■ **Description:** Cespitose, up to 20 cm. tall. Stems are compressed, covered with foliar sheaths. Leaves are distic, falcate, obtuse, 4 to 5 cm. long. Inflorescence with one to two flowers, with a short peduncle, pendant. Flowers are patent, 1.4 cm. diameter, yellow with an orange-brown callus, the base of the sepals and petals is more pale. Floral bract is dilated towards the apex, 3 mm. long. Pedicel ovary is 5.5 mm. long, arched, creamy-white. Sepals are widely elliptic; apiculate, with five nerves, 3.5 mm. long, concave, with curved apex. Petals are 5 mm. long, acute, concave, translucent, with curved edges. Lip is 10 mm. long, with a small auricle at the point of contraction, deeply retuse, with serrate edges; disc with a concave callus at the base and tuber; the center of the callus is conspicuously thickened. Column is short with two conspicuous wings, triangular, acute apex; the inside of the column has a transverse thickening, purple underneath the stigma.

Habitat: Epiphyte in evergreen forest.

Flowering season: January.

Observations: Rare species, we have seen only one small specimen in cultivation in los Guatuzos. Leaves are longer and less wide than *L. micrantha* in the same habitat.

Lophiaris altissimum

(Jacq) Braem 1993

■ **Description:** Up to 2 m long, with very small pseudobulbs, generally less than 1.5 cm. long, unifoliate, covered with imbricate scarious sheaths. Leaves are apical, obtuse to acute, rigid, coriaceous, up to 60 cm. long. Peduncle from the base of the pseudobulb, up to 2 m long with several tight sheaths. Floral

bracts are small, scarious, acute, up to 1 cm. long. Flowers are variable in color, generally brown; lip with a red-brown intermediate lobe, isthmus and lateral lobes of the lip are magenta and the wings of the column are violet. Sepals and petals are concave to cucullate; dorsal sepal is 13 mm. long, including the 5 mm. nail, with crenulate edges; lamina is sub-orbicular, 9 mm. wide; lateral sepals with an elliptic 5 mm. wide lamina. Petals are elliptic, with a short nail, 11 mm. long. Lip is 15 mm. long and the intermediate lobe is 15 mm. wide.

Habitat: Epiphyte in open fields, pasture and sometimes on rocks around 1000 m.

Flowering season: February- May.

Observations: We have not found a way to differentiate the *Trichocentrum* species until they flower. Then there is a lot of variation among each species and we have found more than one species in a given locality.

Lophiaris aurisasinorum
(Stadl. & L.O. Williams) Braem 1993

■ **Description:** Fleshy and coriaceous leaves, up to 20 cm., with white flowers on the pendant raceme. Leaves are oblanceolate, acute, apiculate, with a very short petiole and without pseudobulbs. Pendant raceme, simple to densely paniculate, 5 to 25 cm. long, with up to 30 flowers. Floral bract is brown, acute, 6 mm. long. Sepals have 7 nerves, orbicular; dorsal sepal is 10 mm. long, with a 10 mm. long nail; lateral sepals are 12 mm. with an 11 mm. long nail. All sepals have slight red patches on the outside, green on the interior lower half. Petals are rectangular, truncate to obtuse, green, 14 mm. long and with a 2 mm. long nail. Lip is trilobed, white, 15 mm. long over the lateral lobes and 18 mm. wide over the intermediate lobe; lateral lobes are rectangular, but with the edges so reflexed that they look triangular in natural position; edges of the isthmus are equally curved; disc with a linear triangular callus that extends from in between the lateral lobes along the isthmus; bifurcated callus on the base; short column.

Habitat: Epiphyte in dry mountains, 800-1300 m, on oak bark and on tree or branches.

Hooks.

Flowering season: June to August and January to February.

Observations: This species is very vulnerable to excess humidity, requires substrate that dries rapidly.

Lophiaris carthagenense
(Jacq.) 1763

■ **Description:** With very small pseudobulbs, visible only when the pseudobulbs are old, 2 cm. long, unifoliate. Leaves are fleshy and coriaceous, up to 50 cm. long, conduplicate at the base, dark green with purple spots. Lateral inflorescence, multiflowered panicule, up to 2.5 m long, arched, peduncle with purple patches. Flowers are white with big purple patches. Sepals are unguiculate, rounded on the apex, wavy edges, white with purple patches; dorsal sepal is 8 mm. long; lateral sepals are 10 mm. long. Petals have the same color as sepals, 9 mm.

long, wavy edges. Lip is 12 mm. long, trilobed; lateral lobes with revolute edges, yellow with red brown patches; intermediate lobe with white background and edges, with purple patches, round to retuse on the apex; disc with a fleshy callus, elevated, with several tubercles, yellow on the base and white with purple towards the apex. Column is short, with a pair of bilobed wings on the apex, white anther with a purple stripe in the center.

Habitat: Epiphyte in wet-tropical forest near swamps and rivers, from 0 to 1200 m.

Flowering season: May to August.

Observations: This is the most common *Lophiaris* in Nicaragua and it presents abundant variation. It is highly adaptable to hot, and to dry habitat.

Lophiaris luridum
(Lind 1823) Braem 1993

■ **Description:** Up to 2 m long, with small pseudobulbs, generally less than 1.5 cm., unifoliate and covered with imbricate and scarious sheaths. Leaf is apical, obtuse to acute, rigidly coriaceous, up to 60 cm. long. Peduncle from the base of the pseudobulb, up to 2 m, with several tight sheaths. Floral bracts are small, scarious, acute, up to 1 cm. Flowers are variable in color, generally white with brown patches; lip with pink intermediate lobe, isthmus and lateral lobes of the lip are magenta and the wings have violet patches. Sepals and petals are concave to cucullate; dorsal sepal is 13 mm. long, including a 5 mm. long nail, crenulate edges, sub-orbicular lamina that is 13 mm. wide; lateral sepals with an elliptic lamina and 5 mm. wide. Petals are elliptic with a short nail, 11 mm. Lip is 15 mm. and intermediate lobe is 15 mm. wide.

Habitat: Epiphyte dry, pre-montaine forest, 700-900 m.

Flowering season: February to May.

Observations: New report for Nicaragua, even though we have seen half a dozen plants, intermediate flowers between *T. altissimum* and *T. carthagenense*, lip is big and wide as *T. altissimum* but with patches as *T. carthagenense*, fewer flowers than *T. carthagenense*.

Lycaste aromatica
(Graham ex. Hooker) 1826

■ **Description:** With ovate pseudobulbs, compressed, to 8 cm. long, covered at its base with fibrous sheaths and several apical leaves, two 3-4mm. spines. Leaves are plicate, acuminate, lanceolate, up to 55 cm. long. Lateral inflorescences from the base of the pseudobulbs, unifloral, with a thin and 15 cm. long peduncle and covered with several inflated sheaths. Flowers are big, showy and smell of cinammon, yellow. Sepals are patent, acute, slightly pubescent in the bases making a truncate chin. Petals are dark yellow, obtuse, 3 to 3.5 cm. long, lip is articulated with the foot of the column, concave underneath, trilobed above, 3 cm. long; lateral lobes are elliptic to almost lanceolate, obtuse, with crenate edges; intermediate lobe is curved, from sub-orbicular and elliptic to cuneate-spatulate, with wavy or crenulate edges; disc is pubescent, thickened along the center and a truncate,

cuneate and wide callus covering the entire base of the intermediate lobe, wider than the isthmus when flat. Column is yellow, pubescent on the front, 2.5 cm. long, with a foot.

Habitat: Epiphyte; on main trunks grows in wet to semi-dry mountains under direct sunlight.

Flowering season: February to April in its natural habitat.

Observations: This is the most common *Lycaste* species in forests above 1000 m. in the northern region of the country, where it can grow into big plants. Its cinnamon scent is diagnostic to differentiate it from *L. bradeorum*, very similar and also the fact that it flowers when it does not have its deciduous leaves.

Lycaste stet.

■ **Description:** Without leaves during the flowering season. Ovate pseudobulbs up to 12 cm., compressed, with two to three short apical teeth, with less than 2 mm. long. Inflorescence with solitary flowers on a very thin 11 cm. peduncle, with up to five inflated sheaths, 1.5 cm. long. Flowers with yellow-greenish sepals, yellow-orange petals and cream column. Floral bracts are inflated, ovate, 1.5 cm. long; pedicel ovary is erect, up to 2.5 cm. long. Sepal is convex on the apical portion, concave on the basal portion, with soft hairs at the base; apex is fleshy and reflexed. Dorsal sepal is 3 cm. long; lateral sepal is patent, oblique, 3 cm. long. Petals are similar to sepals, 2.5 cm. long. Lip is trilobed, with erect lateral lobes and reflexed apices; intermediate lobe is trilobed with retuse lateral lobes and an apicule on the sinus; the lip is 2.5 cm. long; disc with a flat, fleshy callus, 5 mm. long with an obtuse apex. Column is arched, 1.5 cm. long, with a 5 mm. long foot and conspicuously ciliated inside.

Habitat: Epiphyte in cloud forest.

Flowering season: June – August.

Observations: Rare in Nicaragua, same forests as *L. aromatica*, we have seen only a few Nicaraguan specimens on the Matagalpa-Jinotega road along with with other *L. aromatica*.

Lycaste angelae

Oakeley 2008.

■ **Description:** Ovate pseudobulbs, compressed, 12 cm. long, with 1 to 2 mm. spines on the apex. Leaves are acute, plicate, not completely developed during the flowering season. Lateral Inflorescences, solitary, with a 10-15 cm. long peduncle and three brown sheaths, tight, acuminate. Sepals are greenish with pink patches. Petals are white, palely patched with pink; lip is white with pale pink patches in the center of the base; callus is orange with red edges; column is white with an orange interior. Floral bract is similar to the sheaths. Sepals with an acute conduplicate apex; the apical portion is reflexed, with wavy edges; dorsal, sepal are 4.5 cm and lateral free up to the bases. Petals are 4.1 cm. long with an acute reflexed apex, edges are slightly wavy. Lip is trilobed above the middle, 4 cm. long; the apex of the lateral lobes is acute; intermediate lobe is ovate, 1.6 cm. long, frilly edges; apex is slightly retuse with an acute apicule on the sinus; disc is slightly pubescent; callus is elevated on the lower half, with a sulcate upper half and elevated edges, apex is

slightly expanded and round. Column is white, inside is pubescent, with the foot, arched, 2.5 cm. long.

Habitat: Epiphyte in cloud forest.

Flowering season: May to June.

Observations: We have not seen Nicaraguan material of this species, pictures taken from Costa Rican specimens in cultivation in Nicaragua.

Lycaste cochleata

Lindl. 1851

■ **Description:** Compressed pseudobulbs, 6 cm. long, covered with fibrous sheaths airy triangular acuminate with two long spines approx 4mm, with several plicate and acuminate deciduous leaves, 25 cm. long. Lateral inflorescences with a new shoot, solitary, unifloral, several successive flowers. Peduncle is 10 cm. long, thin, with inflated sheaths. Flowers are showy, orange or reddish yellow. Dorsal and lateral sepals 28 mm. long, connate to the bases and forming an angle with the foot of the column, greenish-yellowish. Petals are 15 mm. long, orange. Lip is tri-lobed, articulating with the foot of the column; basal portion is sacciform; lateral lobes are erect and curved on the apices, elliptic, obtuse; intermediate lobe is sub-orbicular, crenulate edges; disc with a wide callus, fleshy. Column is 20 mm. long, including the elongated foot, light yellow, somewhat pubescent on the front.

Habitat: Epiphytic or lithophilic in pre-montane forest at 400-600 m.

Flowering season: April to July.

Observations: Not common, grows at intermediate altitude, in forest with deciduous leaves; the flower opens very little.

Lycaste deppei

(Lodd.) 1843

■ **Description:** Escapitose, up to 30 cm. tall. Pseudobulbs are ovate, compressed, without apical teeth, to 6 cm. long, covered with several scarious sheaths. Two leaves from the apex of the pseudobulbs, present during the flowering season, widely elliptic-lanceolate, acuminate, plicate, 20 cm. long, including the conduplicate, 5 cm. long petiole. Inflorescences are unifloral from the base of the pseudobulbs with an peduncle with three to four inflated green sheaths, up to 3 cm. long. Flowers: sepals are pale green with red patches; petals are green-white with red patches on the inside near the base; lip is orange-yellowish with red patches on the intermediate lobe and on the apex of the lateral lobes; red stripes on the lateral lobes. Floral bract is involute, 3 cm. long. Sepals are concave, 3 cm. long, acute, finely pubescent on the inside near the base; dorsal sepal is 1.8 cm. wide; lateral sepal is 2 cm. wide, oblique and patent, with reflexed apex. Petals form a cuculla over the column, acute and reflexed, 3.5 cm. long. Lip is tri-lobed near the middle, with conspicuous nerves on the obtuse lateral lobes; intermediate lobe is apiculate, with crenulate edges, 1.5 cm. long; the entire lip is 3.2 cm. long; disc with a callus between the lateral lobes, which ends in a free apex that expands from the base to the intermediate lobe.

Habitat: Epiphyte in wet forests.

Flowering season: March to July.

Observations: We have seen specimens of this species in Costa Rica and Guatemala but not in Nicaragua.

Lycaste dowiana

Endres & Reichembach 1874

■ **Description:** Up to 60 cm. tall. Pseudobulbs are compressed, ovate, 8 to 10 cm. long, without teeth on the apex, wrinkled. four to six leaves, including those on the sheaths, plicate and shortly acuminate, up to 40 cm. long, including the 8 to 10 cm. long petiole. Solitary Inflorescence, unifloral, with a thin, flexible peduncle, 8 to 9 cm. long, covered with for inflated sheaths, 2 to 2.5 cm. long. Flowers are showy; sepals are olive green to brown, petals are white to slightly creamy; lip is white to cream with red patches on the callus; column is yellow with a red base. Floral bract is ovate, acute, inflated, 2.5 cm. long. Sepals are slightly concave; fleshy apex, 3.8 to 4 cm. long; lateral sepals are slightly oblique. Petals are elliptic, gradually attenuated towards the base, with irregular edges, 3.3 cm. long. Lip is trilobed above the middle, 3 to 3.5 cm. long; lateral lobes are dolabriform, erect; intermediate lobe is 1.2 cm. long; apex is slightly retuse; disc with a wide and elevated callus from the base to the middle of the lip where it forms an elevated and excavated callus.

Habitat: Epiphyte in rain forest.

Flowering season: June to November.

Observations: We have seen it only on Mombacho Volcano, and in the Indio Maiz Reserve. A pater variety is more common than nominate form.

Lycaste macrophylla desboisiana

Cogniaux 1897

■ **Description:** Large wrinkled pseudobulbs, without teeth on the apex, long plicate leaf and with a solitary and unifloral Inflorescence. Peduncle is relatively long and thick. Flowers are big, showy, up to 10 cm. in diameter. Sepals are green to dark brown, 5 cm. long. Petals are white with carmine-red center and a 5 cm. carmine-red base, with erose apices and a curved apical half. Lip is 4 cm. long, tri-lobed; lateral lobes are curved in a natural position; intermediate lobe is sub-orbicular, with erose edges, slightly retuse at the apex, 1.5 cm. long; lip white with carmine red lateral lobes; edges and an intermediate lobe with carmine-red patches; between the lateral lobes there is an oblong callus from the middle of the lip to the base of the intermediate lobe, another verrucose callus extends over the intermediate lobe and covers almost half the width. Column is thin with a wide foot.

Habitat: Epiphyte in rain forests.

Flowering season: November.

Observations: We have not seen this subspecies in Nicaragua, but the nominate form of *dowiana* resemble some forms of *L. macrophylla*.

Lycaste suaveolens

Summerhayes 1931

■ **Description:** Cespitose, generally without leaves during the flowering season. Pseudobulbs are compressed, sub-orbicular, ovate, wrinkled, with, or without small apical teeth, 6 cm. long. Inflorescence from the base of the pseudobulbs, solitary, unifloral, with a 6 cm. long peduncle, partially hidden behind three brown sheaths on the interior portion and an inflated sheath on the upper part. Flowers are showy, patent; sepals are yellowish-greenish, yellow petals, orange-yellowish lip and cream column. Floral bract is acute, 1.3 cm. long, with red-brown patches. Sepals with an apiculate apex, 1.5 cm. wide, with few hairs near the interior base; dorsal sepal is 2.5 cm. long; lateral sepal is 3 cm. long, forming a conspicuous angle. Petals are ovate, retuse on the fleshy apex, sub-obtuse, with an apicule on the sinus, 2.2 cm. long. Lip is tri-lobed, oblong on the basal half, with obtuse lateral lobes, subquadrate when flattened; intermediate lobe is sub-orbicular, retuse with erose-serrate edges, 1.4 cm. long, including the 3 mm. long nail. The complete lip is 2.2 cm. long; disc with a 3 mm. long callus, slightly retuse, with long cilia on the lateral edges, the rest of the lip is glabrous.

Habitat: Epiphyte in rainy areas.

Flowering season: February to April.

Observations: We have not seen this species; information from Hamer (2001).

Lyroglossa pubicaulis

(L.O. Williams) 1946

■ **Description:** Erect, up to 30 cm. tall, with a thin and pubescent floral scape, covered with four lanceolate sheaths, sub-scarious. Leaves are absent during the flowering season, very small and conduplicate. Inflorescence is laxly paucifloral with up to 10 flowers. Floral bract is inflated, 1 cm. long, pedicel, 1 cm. long and densely pubescent. Flowers have an unknown color. Sepals are glabrous inside, very pubescent externally, with inside, 7 mm. long, acute and oblique, tri-nerved, arched. Petals are 7 mm. long, falcate, with five conspicuous nerves. Lip is 9 mm. long, with 3 branched nerves; the upper half is semi-orbicular, crenulato; the lower half is sub-orbicular, attenuated towards the base with two marginal and pubescent calli on each side. Column is 5 mm. long, with a short rostellum.

Habitat: Terrestrial.

Flowering season: June to October.

Observations: We have not seen this species; information from Hamer (2001).

Macradenia brassavolae

Reichembach 1852

■ **Description:** Pseudobulbs are thin, almost cylindrical, unifoliate, curved, 3.5 to 4 cm. long. Leaf is erect, sub-coriaceous, obtuse to acute, 15 cm. long. Inflorescence from the base of pseudobulb; peduncle is thin, pendant; bracts are acuminate, scarious, approximately 10 cm. long, including the 6 cm. long

raceme, with 10 to 15 flowers. Flowers with brown sepals and petals and short, yellow to greenish edges, with a short pedicel ovary. Lip is white with brown patches, sepals and petals are similar, patent, largely acuminate, slightly curved on the apices; dorsal sepal is 17 mm. long; lateral sepal is 18 mm. long; petals are 16 mm. long. Lip is fleshy, sessile, trilobed, with round lateral lobes and a long, filiform intermediate lobe; lip is 15 mm. long with a 10 mm. intermediate lobe. Column is fleshy, terete, 6 to 7 mm. long, with imbricate wings on the apex.

Habitat: Epiphyte in old growth rain forest.

Flowering season: October to January.

Observations: Rare and not very showy; Hamer suspected its presence in Nicaragua without confirming it we have found this species only along the Rio San Juan, both in the normal color form and var. *alba*.

Macroclinium bicolor

(Lindley) 1842

■ **Description:** Pseudobulbs are less than 10 mm. long and completely covered with sheaths that have foliar limbs, unifoliate. Leaves articulate with sheaths, fleshy, acute, conduplicate, green, up to 12 cm. long. Lateral inflorescence, patent or pendant, 10 cm. long, raceme has approximately 10 flowers; peduncle is very thin with patent flowers. Flowers are pale green-purple, big for such a small plant, with a 6 mm. long pedicel ovary. Sepals are pale green; dorsal sepal is 11 mm. wide; lateral sepals are connate, 2 mm. at the base and 1 mm. wide. Petals are 9 mm. long, attenuate, falcate, light purple background with purple patches. Lip is 7 mm. long, adnate to the base of the column, with a white nail, 2 mm. long, largely caudate at the apex, light purple background with purple patches. Column is 5 mm. long, terete and green.

Habitat: Epiphyte in swamps, especially cypresses.

Flowering season: July, December, February.

Observations: We have not seen this species Nicaragua.

Macroclinium paniculatum

(Ames & Schweinfurth) 1930

■ **Description:** Erect, up to 5 cm. tall. Pseudobulbs are hidden behind sheaths with foliar limbs and erose edges. Leaves are erect, sessile, falcate, abruptly acuminate, 4.5 cm. long. Inflorescence is erect, from the axil of the leaf sheath, almost as long as the leaves, peduncle is filiform, 3 cm. long, with up to 12 flowers. Flowers are patent; sepals are whitish green, lip and petals are pink, slightly patched or striped in dark pink; column is dark pink. Sepals are trinerved; dorsal sepal is 6 mm. long; lateral sepal is connate, up to 2 mm. From the base, 6 mm. long. Petals are 5.5 mm. long, with finely erose edges. Lip is 5 mm. long, with a linear nail, deeply sulcate on the underside, lamina is 3.6 mm. long, with a fleshy auricle on each side of the base, the middle is abruptly dilated to form a triangular-cordiform portion, with irregularly crenulados edges and an acuminate to mucronate apex. Column is thin, 2.5 mm. long, with a dilated apex.

Habitat: Epiphyte on tropical, semi-wet areas.

Flowering season: December.

Observations: We have not seen this species; information from Hamer (2001).

Microchilus querticola

(Lindley) D. Dietr. 1852

■ **Description:** Up to 30 cm. tall. Stem is foliose, basal portions without leaves. Leaves with wavy edges, 4 cm., including the 1.5 cm. petiole. Inflorescence is short, terminal, 4.5 cm., raceme. Flowers with white petals and sepals, and greenish base, with slightly brown apices; intermediate lobe of the lip is white, the rest is greenish. Floral bract is 7 mm. Sepal with fleshy and thickened apex, concave, 1.5 mm. wide. Lip is 5 mm, including the sacciform spur, panduriform above the middle; lamina is expanded and abruptly contracted to form a bilobed and verrucose intermediate lobe, reflexed, with a triangular fleshy lobe on the sinus. Column is 2.5 mm.

Habitat: Terrestrial in the dwarf forest of Mt. Mombacho.

Flowering season: June to October.

Observations: On Mt. Mombacho, three very similar species are reported which seem to be synonymous for us, especially because they are abundant there but we have not seen these species in other areas.

Malaxis aurea

Ames 1923

■ **Description:** unifoliate, small pseudobulbs, covered with scarios sheaths. Leaves are green, obtuse, with sheathed petiole, limb is 8 cm. long, carinae inside. Inflorescence is corymbose, multifloral, 2.5 cm. diameter. Peduncle is elongated, 3 cm. long. Flowers are green-yellowish, with a thin pedicel ovary, 1 cm. long. Sepals are 3 mm. long, with revolute edges, green-yellowish. Petals are 2.5 mm. long, filiform, green, curved. Lip is 2.5 mm. long, on top of the flower, very fleshy, truncate, with a fleshy lobe on the apex, with two oval concavities on the lamina, curved edges, with three elevated carinae on the concave part of the lip. Column is short, thick and fleshy.

Habitat: Terrestrial or lithophilic on old lava beds.

Flowering season: July.

Observations: We have not seen this species; information from Hamer (2001).

Malaxis brachyrrhynchos

(Reichembach) 1888

■ **Description:** Up to 50 cm. long, with thick subterranean pseudobulbs, covered with scarios sheaths, with two green opposed leaves and a petiole that surrounds the lower half of the floral scape; foliar limbs are 12 cm. long with the underside lighter than the top. Inflorescence is densely multifloral; peduncle is up to 30 cm. tall, hexagonal, green. Flowers are green, with dark green lip, 8 mm. long, 2 cm. long pedicel ovary. Sepals are 4 mm. long, fleshy, concave, on top of the flowers, thickened apex, dark green; interior of the lamina with a thick-

ened central nerve, wide, elevated, and darker, leaving two oval depressions on the sides. Column is 1 mm. long, thick.

Habitat: Terrestrial in pine-oak forest.

Flowering season: May to July.

Observations: Not common; we have found it in pine forest at 1400 m., where the bulbs were buried almost 15 cm.

Malaxis brachystachya

(Lindley) Reichebach f. 1861

■ **Description:** 8 to 35 cm. tall with thin, glabrous stems from the thickened base, pseudobulbous, with a solitary leaf surrounding the floral scape with the base; the lamina of the leaf is 8 cm. long, cordiform at the base, obtuse to acute on the apex. Raceme up to 3 cm. diameter; floral bracts are 2 mm; pedicel ovary is thin, up to 13 mm. long. Flowers are green; sepals are trinerved, 3 cm. long, with curved edges; petals are uninerved, 2 mm. long; lip is above the flower, 2.5 mm. long, dark green with conspicuous auricles at the base, attenuate towards the apex to abruptly acuminate, concave underneath the middle, without carinae on the concavity. Column is short, 1 mm. long.

Habitat: Terrestrial in deciduous forest.

Flowering season: July.

Observations: We have not seen this species; information from Hamer (2001).

Malaxis carnosa

(Kunth.) C. Schweinfurth 1941

■ **Description:** 30 cm. tall, with subterranean pseudobulbs, 1 to 1.5 cm. diameter, covered with scarious sheaths, unifoliate. Leaves with a long petiole covering the floral scape; limb is 3 cm. long, green. Inflorescence is 27 cm. tall, elongated raceme, densely multifloral; angular peduncle, green. Flowers are small and inconspicuous, green-yellowish. Sepal is 1.75 mm. long, connate, with thickened apices and slightly wavy edges. Petals are 1.5 mm. long, obtuse, green-yellowish. Lip is 1.5 mm, green, above the flower, concave, thickened and fleshy edges, with a fleshy apicule on the apex. Column is short and thick.

Habitat: Terrestrial in pine forest.

Flowering season: July and August.

Observations: We have not seen this species; information from Hamer (2001).

Malaxis excavata

(Lindley) Kunze 1893

■ **Description:** Erect, glabrous, thin, up to 18 cm. tall, sometimes epiphytic, with ovate pseudobulbs, conical, 3 cm. long. Floral scape is bifoliate, narrowly winged, 18 cm. tall, with basal sheaths. Leaves are sub-opposed near the middle of the scape; leaf blade is 8 cm. long, acute, with slightly crenulate edges. Raceme is approximately 2 cm. long. Flowers are greenish with orange pollinia. Floral bract is acuminate, patent, 3 cm. long. Dorsal sepal is acute, 4.5 mm. long; lateral sepal is

obliquely adnate underneath the middle, 4.5 mm. long. Petals are acuminate, 3.5 mm. long, twisted. Lip is fleshy, ovate, 4 mm. long, with basal auricles; apex is trilobed, with a longer intermediate tooth; disc is concave in the center, with a pair of deep and elliptic depressions, separated by a fleshy carinae and connected in front of a transversely erose membrane.

Habitat: Terrestrial or Epiphyte in rain forest.

Flowering season: February.

Observations: The only *Malaxis* we have seen growing as an Epiphyte. Very common on Maderas volcano, above 800 m. in cloud forest with moss layers.

Malaxis excavata

(Lindley) Kunze 1893

■ **Description:** 25 cm. tall, with piriform pseudobulbs, up to 4 cm. long, covered with several persistent sheaths. Two green opposed leaves, with relatively long petioles, blade is 8 cm. long, acute, rounded at the base. Peduncle and raceme are 15 cm. long, conspicuously winged, surrounding the base of the upper leaf. Flowers are green, successive; raceme bracts are patent, 2.5 mm. long; pedicel ovary is 1.5 to 2 cm. long, thin and obliquely patent. Sepals are 7 mm. long; dorsal sepal is 3.5 mm. wide, lateral sepal is 3 mm. wide. Petals are 4 mm. long, linear, less than 1 mm. wide. Lip including the basal auricles is 5 mm. long and 4 mm. wide, with a tridentate apex, but with unequal teeth, intermediate tooth is longer than the laterals; auricles on the basal portion are 2 mm. long, acute, falcate, curved; disc with two conspicuous concavities near the middle, separated between them by a longitudinally thickened carina. Short column.

Habitat: Terrestrial in cloud forest.

Flowering season: April to July.

Observations: Sprouting from bulb depends on rainfall conditions, with flowering following within a few weeks.

Malaxis fastigiata

(Reichebach f.) Kunze 1891

■ **Description:** Up to 40 cm. tall with a 4 to 7 cm. stem from a bulbous corm, with two petioled leaves; basal portions of the petioles surrounding the stems. Leaves with a 5 to 7 cm. long blade, oval to widely ovate, obtuse, membranous. Peduncle is thin, 5 to 10 cm. long, angular, ending in a racemose inflorescence, multifloral with green flowers. Dorsal sepal is 3.5 mm. long, widely lanceolate, obtuse; lateral sepal is 3.5 mm. long, lanceolate, obtuse, free up to the bases. Petals are 2.5 mm. long, linear. Lip is on top of the flower, 3 mm. long, with an acute or obtuse apex; disc is somewhat fleshy, with two conspicuous concavities in the center, separated by a longitudinal carina. Column is short and wide.

Habitat: Terrestrial on montaine meadows.

Flowering season: July.

Observations: Grows near the edge of the Mombacho Volcano reserve, keeps its leaves until January while it develops seeds.

Malaxis histionantha

(Link., Klotzsch & Otto) Garay & Dunsterv. 1976

■ **Description:** Erect, glabrous, up to 50 cm. tall. Floral scape is slightly winged, from a short rhizome of a periforme base. Two sub-opposed leaves, with a patent lamina, widely elliptic, sub-acuminate, with wavy edges, up to 9 cm. long. Capitulate inflorescence, densely multifloral with all its flowers in the same plane, less than 1 cm. long. Flowers are brown-greenish. Floral bract is acuminate, up to 3 mm. long. Sepals are revolute, almost tubular; dorsal sepal is obtuse, tri-nerved, 7 mm. long; lateral sepal is oblique, 4.5 mm. long. Petals are shortly lanceolate, acuminate, uninerved, twisted, 2.5 mm. long lip is patent, widely cordiforme, with an obtuse apex and a depression near the base, 4 mm. long. Column is short, rigid, 1 mm. long.

Habitat: Terrestrial on wet mountains.

Flowering season: September.

Observations: We have not seen this species; information from Hamer (2001).

Malaxis majanthemifolia

Schlechter & Cham 1831

■ **Description:** 10 to 15 cm. tall. Pseudobulbs are 2 cm. long, covered with brown sheath. A dark green leaf, 8 cm. long, wavy edges, with a petiole that surrounds the basal portion of the floral scape. Inflorescence is elongate, multi flowered raceme, green peduncle, angular, with longitudinal carinae. Flowers are green to greenish-yellow with brown patches on the lip, 5 mm. long, with 3mm. pedicel ovary. Sepals are pale green or yellowish green, with curved edges; dorsal sepal is 3 mm. long and lateral sepal is 2.5 mm. long, these latter are connate up to the lower half. Petals are 2.5 mm. long, light green. Lip is 2.5 mm. long, above the flowers, triangular with conspicuous basal auricles; lamina is concave, pale green, but edges of the concavity are brown. Column is 1 mm. long, wide, dark green.

Habitat: Terrestrial in pine forest.

Flowering season: October.

Observations: We have not seen this species; information from Hamer (2001).

Malaxis soulei

L.O. Williams 1934

■ **Description:** Glabrous, up to 25 cm. tall, with few short roots. Floral scape from the thickened bulb, 40 cm. long. Covered with tight 2 cm. sheaths; peduncle is sub-quadrate, thin, 7 cm. long up to the first flower, unifoliate. Leaf with a cordate base, revolute edges, dorsally carinate, with a shorter carina on either side; the basal portion surrounds the peduncle 5 cm. long; generally wrinkled surface. Inflorescence in a densely multifloral spike with approximately 300 to 400 small and tight flowers; rachis is angular and carinate. Flowers are green with white anthers; lip is above the flower. Floral bract is fleshy, verrucose, inflated near the middle. Sepals are 1.8 mm. long, with revolute edges, sub-acute, erose surface; dorsal sepal is widely lobed, slightly reflexed on the apex; lateral sepal is

adnate for one third of its length, concave. Petals are generally erect, sub-acute 1.3 mm. long. Lip is elliptic in natural position, widely cordate when flattened, deeply concave, auricle at the base, with involute basal edges; apex with three triangular lobes, 1.7 mm. long, with a wide and short nail. Column is short, rigid, 0.9 mm. long, parallel to the lip.

Habitat: Terrestrial; in pine forest.

Flowering season: August.

Observations: We have not seen it in Nicaragua. but we found it in Mexico on the slopes of Popocatepetl Volcano at 2500 m. in a pine forest with abundant *Habenaria* and *Stenorrhynchos*.

Malaxis unifolia

(Lindley) 1845

■ **Description:** up to 30 cm. tall. Subterranean pseudobulbs. A leaf with a petiole that surrounds the floral scape in the lower half; stem is 7 cm. long, green, with lighter and more visible nerves; edges are somewhat curved; apex obtuse. Multi-flowered racemose inflorescence, angular dark green peduncle. Flowers are yellowish-green with a dark green center. Sepals are green-yellowish or pale green; dorsal sepal is 1.7 mm. long and lateral sepal is connate at the base. Petals are filiform, 1.5 mm. long, sometimes very twisted, green-yellowish. Lip is 2 mm. long, concave in the center, auricle at the base, irregularly dentate; apex is trilobed, with the central lobe shorter than the lateral lobes. Column is short and thick, with two elevated lateral teeth, white, with a dark green base.

Habitat: Terrestrial.

Flowering season: July and August.

Observations: We have not seen this species; information from Hamer (2001).

Masdevallia chontalensis

Rchmb.f. 1878

■ **Description:** Short stems, up to 10 mm. long, unifoliate, covered with tubular sheaths, inflated, 15 mm. long. Leaves are coriaceous, fleshy, tridentate at the apex, 4.5 cm. long, including the 10 mm. petiole. Inflorescence, generally with two flowers on a 7 cm. stem extending beyond the leaves. Flowers are tubular, white, with yellowish tips on the sepals and yellowish lip, with some red patches. Floral bract is apiculate, 4 mm. long; pedicel ovary is 5 mm. long. Sepals are united forming a tube, portions of the dorsal sepal are free, 8 mm. long, including the 6 mm. cauda; lateral sepal is 8 mm. long, with 5 mm. cauds; three elevated nerves on each sepal. Petals with a truncate apex, tridentate, with a linear callus in the anterior edges, 4 mm. lip is obtuse, dilated towards the apex, erose edges, 4.1 mm. long; disc is verrucose, longitudinally grooved with elevated carinae on the sides of the channel that fuse towards the apex. Column is winged, 3 mm. long, with a curved foot, 1.5 mm. long.

Habitat: Epiphyte in cloud forest canopy.

Flowering season: November to March.

Observations: This is the most common *Masdevallia*, requires temperate climate, does not survive at low altitudes. Grows on branches and trunks exposed to sunlight and wind.

Masdevallia mollosoides

Kraenzl. 1921

■ **Description:** Erect, up to 8 cm. tall, secondary stems are very short and covered with white sheaths, with one erect leaf, oblong, with a 25 mm. long blade and a sulcate, 4 cm. long petiole. Inflorescence is unifloral, erect, larger than the leaves. Flowers are green-yellowish with orange-red veins, the tails of the sepals are orange, petals are yellow with red patches and the lip is yellow. Floral bract is 8 mm. long; pedicel ovary is arched with mucronate carinae. Sepals are connate for more than half their length, forming a sub-triangular tube, with carinate nerves and the interior and exterior are glandulous verrucose; the edges are pilose and ciliated; dorsal sepal is 8 mm. long, besides the 8 mm. long cauda; lateral sepal is 10 mm. long and an 8 mm. long cauda; caudas are 1 mm. wide on the apex; caudas are thickened only on the apical quarter. Petals are oblong, with a small triangular lobe underneath the middle, a short triangular carina on the interior part near the apex. Lip is 6 mm. long, with a 1.25 mm. long nail; the apical lobe is sub-orbicular and the lateral lobes are verrucose. Column is thin, dentate on the apex, 5 mm. long, with a 2.7 mm. foot.

Habitat: Epiphyte on rain forest.

Flowering season: May to July.

Observations: We have not seen this species; information from Hamer (2001).

Masdevallia nicaraguyae

Luer 1979

■ **Description:** Cespitose, up to 12 cm. tall. Secondary stems are short, 2 to 10 mm. long, unifoliate. Leaves are 5 to 11 cm. long, obtuse, coriaceous, attenuate towards the conduplicate petiole. Inflorescence is unifloral, as long as or shorter than the leaves, with a thin 4-6 cm. peduncle, and a bract underneath the middle. Floral bract is tubular, acute, 6 mm. long. Flowers are white with pink cauda, lip is white with red patches, lateral sepals with red veins. Sepals are united forming a cylinder on the lower half, trinerved, with a carinae central nerve; dorsal sepal in the free portion is semi-terete, thick, 10 mm. long; lateral sepals are 18 mm. long, with a 12 mm. free portion, triangular, divergent, contracted on a thickened cauda. Petals are 5 mm. long, apex is obtuse and slightly trilobed, with a longitudinal callus on each side of the edge, inferior callus ends in an obtuse angle underneath the middle. Lip is white with purple spots, 4.5 mm. long, with an orange and slightly erose apex; disc with a pair of longitudinal calli above the middle, with a truncate base. Column is white, semi-terete, 4 mm. long, with a long wide foot.

Habitat: Epiphyte in rain forests.

Flowering season: August to November.

Observations: This species grows well in mountains and in the plains as long as it rains frequently and the forest is conserved.

Masdevallia nidifica

Reichembach 1878

■ **Description:** Cespitose, up to 5 cm. tall, with a short secondary stem, unifoliate, with 1 to 2 white sheaths. Leaves are 5 cm., including the 2.5 cm. long petiole, with tridentate apex. Inflorescence is solitary with a filiform peduncle, almost as long as the leaves. Flowers are cream-yellowish with red nerves and red cauda, sometimes yellowish. Sepals are connate, forming a tube with a conspicuous chin; basal portion is connate, 6 to 8 mm. long with filiform cauda, 1 to 2 mm. long, with three dorsally carinate nerves; sepal interior is pubescent. Petals are spatulate, with a triangular apex and erose edges, with a diagonal carina on the superior portion near the anterior edge, 3 mm. long. Lip is 3.5 mm. long, trilobed, cordate at the base, with elongated lateral lobes, growing into carinae up to the intermediate lobe. Column is thin, 3 mm. long, with a curved, 2 mm. long foot.

Habitat: Epiphyte on wet mountains.

Flowering season: July.

Observations: Rare species; we have seen it only in Dantál-diablo, in the cloud forest canopy.

Masdevallia tonduzii

Woolward 1906

■ **Description:** Cespitose, up to 12 cm. tall. Secondary stems are short, 2 to 10 mm. long, unifoliate. Leaves are 5 to 11 cm. long, obtuse, coriaceous, attenuate towards the conduplicate petiole. Inflorescence is unifloral, about the same length as the leaves, with a thin 4-6 cm. peduncle, and a bract underneath the middle. Floral bract is tubular, acute, 6 mm. long. Flowers are white with yellowish caudals, lip and lateral sepals white with purple veins on velvety yellow near the base. Sepals are united, forming a cylinder, inside pilose; dorsal sepal in the free portion is semi-terete, thick, 10 mm. long; lateral sepals are 18 mm. long, with a 12 mm. free portion, triangular, divergent, contracted on a thickened cauda. Column is white, semi-terete, 4 mm. long, with a long; wide foot.

Habitat: Epiphyte in rain forests.

Flowering season: August to November.

Observations: This rare species did not do well in cultivation and has been found only once on the lower San Juan River New country record, Fabricio Diaz (2008).

Masdevallia tubuliflora

Ames 1908

■ **Description:** Cespitose, glabrous, 10 cm. tall, with secondary stems less than 5 mm. long, unifoliate. Leaves are coriaceous with a retuse apex, 10 cm. long. Peduncle is thin, unifloral, 7 cm. long with a 5 mm. sheath at the base. Flowers are white with a 6 mm. long floral bract and a 2 cm. pedicel ovary. Sepals are united to form a cylindrical somewhat thickened tube, 1.7 cm. long up to the sinus of the lateral sepals and 1.2 cm. long to the base of the free portion of the dorsal sepals; the three sepals have three nerves; dorsal sepal is 2.5 cm. long

to the base of the tube, the linear part is acute, 1.3 cm. long; lateral sepal is falcate, 2.5 cm. to the base of the tube, the free part is acute, 0.7 cm. long; a gibbose carina forms where the lateral sepals unite. Petals are 5 mm. long, uni-nerved, with a dentate apex, apicule and a linear callus on the anterior edge that forms a thickened apicule at the base. Lip is 4.8 mm. long, fleshy, with an apiculate apex and a cordate and auricle base; disc with 2 laminar calli from the middle to the apex of the lip. Column is 4.5 mm. long, retuse and dentate apex, with a 2 mm. long foot.

Habitat: Epiphyte in cloud forest.

Flowering season: January.

Observations: We have seen it on only one tree in the cloud forest of Mombacho Volcano among *M. chontalensis*, which is more common.

Maxillaria acervata

Reichembach f. 1858

■ **Description:** Cespitose, branched, up to 30 cm.. Stems covered with imbricate and rugose sheaths with foliar limbs. Pseudobulbs are elliptic, compressed, 15 to 25 mm. long, with 1 to 2 leaves, distanced from 2 to 10 cm. long. Leaves with a linear-lanceolate new shoot, acuminate, thin, pale green, up to 40 mm. long; leaves of old plants are dark green, sub-acute, 25 mm. long, with an obliquely bilobed apex. Solitary flowers of the axils of one or two leaf sheaths, successive; sepals, petals and intermediate lobe of the lip are pale yellow-greenish, two thirds of the lip is brown red. Sepals are concave, with an obtuse apiculate apex; dorsal sepal is 10 mm. long; lateral sepal is oblique 11 mm. long, forming a pronounced chin with the base of the column. Petals are oblanceolate, oblique, obtuse, 9 mm. long. Lip is dilated over the middle, forming inconspicuous lateral lobes; edges of the lobes are erect and involute. Intermediate lobe is slightly revolute, with crenulate edges, sub-quadrate, with rounded apex, 10 mm. long; disc with a linear callus, from the base to the lateral lobes, finely papillose on the apex. Column is thin, arched, 7 mm. long, with a 2 mm. long foot.

Habitat: Epiphyte in cloud forest.

Flowering season: November to January.

Observations: This *Maxillaria* looks like a big *Dichaea* with small pseudobulbs, it is not common and grows on tree trunks even on fallen ones, in shade.

Maxillaria aciantha

Reichembach 1852

■ **Description:** Sometimes pendant, up to 30 cm. long. Rhizome is rigid, up to 1 cm. in diameter, covered with imbricate sheaths. Pseudobulbs are oblong, compressed, up to 8 cm. long, very separated, young bulbs are glabrous, old ones are wrinkled, with two to three leaves. Leaves are up to 12 cm., with an obliquely retuse apex, attenuate at the base of a conduplicate and short petiole. Single flowered Inflorescence from the base of the new shoot; peduncle is rigid, 1.5 cm. long, covered with three inflated sheaths, up to 10 mm. long. Flowers are showy, rigid, coriaceous, hard to flatten; sepals and petals are greenish

with orange-yellow edges; lip is dark red with a brown-purple callus; brown anther. Floral bract from the base of the pedicel, 1.5 cm. long. Sepals are acuminate, furrowed, conduplicate, with an apiculate apex; dorsal sepal is 3.2 cm. long; lateral sepal is falcate, 2.9 cm. long. Petals are thinner than sepals, falcate, acuminate, apicule, lanceolate, 2.5 cm. long. Lip is acute, with fleshy apex and curved edges, arched in natural position, 21 mm. long; apical portion is slightly verrucose, base is very short; disc with a linear callus that is very short, extended from the base to the middle of the lip, thickened towards the apex. Column is thin, with a long and ciliated stigmatic cavity, short foot, thick, red, 2.5 cm. long.

Habitat: Epiphyte in wet areas.

Flowering season: October to January according to its location.

Observations: We have found it in the wet forest in the Atlantic as well as in wet forest at 900 m. on trunks in shade.

Maxillaria alba

Hooker

Lindley 1832

■ **Description:** Robust, with elongate rhizome from which numerous Inflorescences and spaced pseudobulbs grow. Pseudobulbs are compressed, unifoliate, 5 cm. long, covered with several imbricate sheaths. Leaf is linear-ligulate, obliquely retuse on the apex, thick, membranous, 25 to 40 cm. long. Peduncle with one flower from the axils of the pseudobulb sheaths, 3.5 cm. long, thin. Flowers with scarious floral bract, white, somewhat bell-shaped, with a thin pedicel ovary, 2 to 3 cm. long. Sepals are coriaceous, acute to acuminate on the thickened apex, with somewhat revolute edges, 25 mm. long; lateral sepal is oblique. Petals are acute to acuminate, thickened apex, 18 mm. long. Lip articulates with the foot of the column, erect, slightly trilobed near the apex, somewhat papillose on the surface, 13 mm. long; lateral lobes are small and round; intermediate lobe is very fleshy, with a fleshy carina; disc is thickened along the center, ending in a semi-orbicular callus immediately underneath the lateral lobes. Column is semi-cylindrical, arched, white with a yellow base.

Habitat: Epiphyte in cloud forest.

Flowering season: August to September.

Observations: This plant is very similar to *M. densa* in the same habitat, but generally can be differentiated by the presence or absence of numerous old flower bases which remain for almost a year.

Maxillaria anceps

Ames & Schweinfurth 1930

■ **Description:** Robust, up to 90 cm. tall, with a 6 to 8 mm. thick rhizome, somewhat compressed and elongated from which several pseudobulbs grow; rhizome is covered with brown sheaths, truncate and imbricate. Pseudobulbs are strongly compressed, obovate, unifoliate, covered with 5 cm. long sheaths. Leaves with a conduplicate base; apex is obliquely retuse and

rounded, up to 30 cm. long. Flowers are slightly fragrant, greenish, solitary, from the axil of the new shoots' sheaths; peduncle is 4 cm. long, partially surrounded with scarious sheaths, imbricate. Floral bract is acuminate, 7 mm. long. Sepals are ligulate; apex is obtuse, concave underneath, with revolute edges, 20 mm. long. Petals are falcate, oblanceolate; apex is obtuse, apiculate, 18 mm. long. Lip is parallel to the column, slightly curved in natural position, trilobed in the middle, with erect lateral lobes; intermediate lobe is ovate, obtuse, sulcate, with five conspicuous nerves, the complete lip is 16 mm. long; disc with a white callus, ligulate, 3 mm. wide, from the base to the middle of the lip. Column is arched, nailed, 1.2 cm. long with a 3 mm. Foot.

Habitat: Epiphyte in cloud forest.

Flowering season: January to February.

Observations: Very similar to *M. alba*, but has fewer flowers, which open less and are more green.

Maxillaria angustisegmenta

Ames, Hubb. & Schweinfurth 1930

■ **Description:** Cespitose, with orbicular pseudobulbs, laterally compressed, unifoliate, covered with scarious and fibrous sheaths that extend beyond the 2.5 cm. wide pseudobulbs. Leaves are largely peciolate, oblong lamina, 13 to 15 cm. long, obliquely round on the apex, dorsally carinate, edges are somewhat wavy, petiole is 4 to 5 cm. long, conduplicate. Lateral Inflorescence of the pseudobulbs, unifloral, 6 to 9 cm. long, partially covered with sheaths which are lost over time. Floral bract is 2 to 3 cm. long, concave, acute. Flowers are big, floral segments are yellow, petals are white, lip with dark red patches at the base. Dorsal sepal is 5.5 cm. long; lateral sepal is 6 mm. long; petals are 4.5 mm. long. Lip is erect, parallel to the column 21 mm. long, trilobed, with curved lateral edges and a curved intermediate lobe; disc with a linear callus from the base to the middle of the lip and ending on a 45° angle; the basal portion to the middle is conspicuously pubescent. Column is short compared to the lip, 1 cm. long with a 3 mm. long foot.

Habitat: Epiphyte; grows on always green areas, on tropical weather.

Flowering season: January to March.

Observations: We have not seen this species; information from Hamer (2001).

Maxillaria angustissima

Ames, Hubb. & Schweinfurth 1934

■ **Description:** Cespitose, up to 20 cm. tall; compressed pseudobulbs, with basal sheaths, without foliar limbs, densely grouped, cylindrical, to 6 cm. long, compressed, verrucose. Leaves are up to 20 cm. long, acuminate and coriaceous. Petiole is absent. Inflorescence is solitary growing from the sheaths at the base of the pseudobulbs, peduncle exceeding the sheaths, to 2 cm. long, covered with 3 or 4 sheaths, up to 15 mm. long; floral bract is 11 to 12 mm. long, almost as long as the ovary and the pedicel. Flowers with yellow greenish sepals, the lip is

pale orange with red patches, the callus has a red longitudinal stripe, the column is white with red patches. Sepals are 12 mm. long, with a fleshy and apiculate apex; dorsal sepal is lanceolate and acute; lateral sepal is acuminate. Petals are oblanceolate, 11 mm. long. Lip is oblong, 11 mm. long; lateral lobes are triangular, acute to acuminate; intermediate lobe is oblong, slightly dilated apically, sub-truncate; common disc, U-shaped callus, thickened longitudinally in the center above the lateral lobes. Column is 7 to 10 mm. long, including the 2.5 mm. Foot.

Habitat: Epiphyte in wet forest on the Atlantic zone.

Flowering season: Not known.

Observations: We have not seen this species; information from Hamer (2001).

Maxillaria brachybulbon

Schlechter 1923

■ **Description:** Up to 6 cm. tall, with a very short rhizome. Pseudobulbs are rugose to verrucose, extremely small, maculate, unifoliate. Leaves are up to 6 cm. long, including the conduplicate 4 to 5 mm. petiole, serrate-ciliated edges on the apex, obliquely retuse and acute. Inflorescence is unifloral from the axils of the basal sheaths, shorter than the leaves with a 10 mm. long peduncle, with 3 to 4 lanceolate and inflated sheaths. Flowers are big with cream-yellowish lip, 4 longitudinal red-brown stripes on the lobes of the lip; yellow intermediate lobe, white column with red-brown stripes. Floral bract is acuminate, finely maculate, 13 mm. long. Sepals are acuminate; dorsal sepal is 13.5 mm. long, carinate; lateral sepal is oblique, 14 mm. long, adnate to the foot of the column forming a conspicuous chin. Petals are acuminate, attenuate towards a short nail, 13 mm. lip is erect, parallel to the column, trilobed near the apex, 8.5 mm. long, with erect lateral lobes, ending on a sub-acute and crenulate apex; disc with an oblong callus, plain, flat.

Habitat: Epiphyte in Atlantic rain forest.

Flowering season: In cultivation it flowers all year.

Observations: We have not seen this species in Nicaragua, but found it on a fallen branch in Braule Carrillo, Costa Rica, where the plant drew our attention because it was similar to a *Masdevallia* and on flowering, we discovered its true identity.

Maxillaria brunnea

Linley & Reichembach 1854

■ **Description:** Up to 40 cm. tall. Pseudobulb is up to 5 cm. long. Leaves are coriaceous, ligulate, sub-acute, with curved edges, up to 35 cm. long, including a 4 cm. long, conduplicate petiole. Inflorescence is 9 to 12 cm. long with 4 inflated sheaths that are up to 2 cm. long. Flowers are ocreaceous; sepals and petals' apices are brown; lip is yellowish with brown-red patches at the base of the intermediate lobe and on the apex of the lip's lateral lobes. Floral bract is inflated, covering the ovary, up to 2 cm. long. Sepals are slightly concave, ligulate, with a rounded apex, up to 30 mm. long. Petals are sub-acute, 25 mm. long. Lip is trilobed near the apex, widely elliptic; intermediate lobe is sub-orbicular, 3 mm. long with fleshy edges, white, crenulate; lateral lobe apex is acute and crenulate; the

complete lip is 14 mm. long. Column is 1.5 cm. long, including the 3 mm. Foot.

Habitat: Epiphyte in cloud forest above 1000 m.

Flowering season: August to November.

Observations: Moderately common, but. has difficulty adapting to warm weather.

Maxillaria caespitifolia

Reichembach 1876

■ **Description:** Rhizome covered with grey sheaths. Pseudobulbs are unifoliate, up to 2.5 cm. long, brown green and verrucose, with dark grey sheaths at the bases. Leaves are 6 to 9 cm. long, carinate, with an asymmetrically bilobed apex. Inflorescence is unifloral, with a thin peduncle from the base and behind the sheaths of the new shoots. Flowers are small, 6 mm. long, yellowish, somewhat fleshy, with a red callus on the lip. Dorsal sepal is concave at the base, 7 mm. long; lateral sepal is oblique, 6 mm. long. Petals are 6 mm. long. Lip is 7 mm. long, fleshy, slightly trilobed, with curved lateral lobes; callus is elevated in the middle of the lip, rounded apex. Column is 5 mm. long.

Habitat: Epiphyte; in wet forest.

Flowering season: January.

Observations: We have not found this species; information from Hamer (2001).

Maxillaria cobanensis

Schlechter 1912

■ **Description:** Small, with aggregated pseudobulbs, on top of a very short rhizome, up to 5 cm. tall. Pseudobulbs are small, oblong, slightly arched, somewhat compressed, unifoliate, 1.5 to 3 cm. long, slightly rugose. Leaves are sub-coriaceous, with a retuse apex, 5 cm. long. Inflorescence from the base of the new shoots, unifloral, with a short 5 mm. long peduncle, covered with up to 8 translucent imbricate sheaths, 7 to 15 mm. long. Flowers are pale pink with red stripes on the apices of all the floral segments, translucent, membranous. Floral bract is 12 mm. long, wide, inflated, brown. Sepals with 5 main nerves, acute; dorsal sepal is 12 mm. long; lateral sepal is slightly oblique, forming a short chin with the foot of the column, 11 mm. long. Petals are acute, oblique, 11 mm. long. Lip articulates with the foot of the column, mobile, trilobed near the apex; lateral lobes are widely rounded; intermediate lobe is widely sub-quadrate, truncate and retuse; lateral lobes are erect in natural position; the complete lip is 9 mm. long; intermediate lobe is 2 mm. long, with erose edges; disc with a small callus, orbicular, near the center of the lip. Column is linear, arched, thin, 8 mm. long with a short 1 mm. long foot. Anther with a cell and four white pollinia.

Habitat: Epiphyte in cloud forest.

Flowering season: May and June.

Observations: We have not seen this species; information from Hamer (2001).

Maxillaria confusa

Ames & Schweinfurth 1925

■ **Description:** Cespitose, 8 to 30 cm. tall. Pseudobulbs are glabrous, compressed, orbicular to elliptic, unifoliate, with a truncate apex, 1.5 to 3.5 cm. long, covered with two to three brown sheaths. Leaves are widely elliptic to ligulate, 7 to 20 cm. long, including the 0.5 to 4 cm. long and conduplicate petiole, with white conspicuous nerves, sub-coriaceous, with an obliquely retuse apex. Inflorescence is unifloral from the base of the leaf sheath, with an erect 3 to 4 cm. penduncle that is partially covered with two to three inflated sheaths, approximately 1 cm. long. Flowers are white, underside of the lip is red violet and the nerves on top of the lip's lateral lobes are red violet. Floral bract is inflated, 1 to 1.3 cm. long. Sepals are acuminate, concave at the base, 11 to 13 nerves; laterals are falcate, adnate to the foot of the column, forming a conspicuous chin; dorsal sepal is lanceolate, 19 mm. long. Petals are falcate, acuminate, 18 mm. long. Lip is trilobed near the apex, 13 mm. long; intermediate lobe is fleshy, with crenulate edges, verrucose, aovate, obtuse, 2.5 mm. long; lateral lobes are obtuse, crenulate; disc is slightly ciliated, with a short callus, fleshy, aovate above the middle. Column is rigid, 5 mm. long, with a thin 5.5 mm. Foot.

Habitat: Epiphyte in pre-montane forest.

Flowering season: July to October.

Observations: We have not seen this species; information from Hamer (2001).

Maxillaria cucullata

Lindley 1840

■ **Description:** With 9 cm. long pseudobulbs, dark green, longitudinally surcate, covered with brown sheaths, unifoliate. Leaves are 40 cm. long, conduplicate at the base, obtuse and green. Lateral inflorescence of the pseudobulbs, inflorescences are, unifloral, with big and inflated sheaths, light green. Flowers are 4 cm. diameter, yellow with purple stripes and patches; yellow to purple lip. Sepal is 25 mm., with variable colors, yellow to greenish yellow background with purple stripes and patches. Petals, 20 mm. long, conduplicate on the apex, erect and united in front of the dorsal sepal, forming a cuculla that has the same colors as the sepals. Lip is 1.5 cm. long, articulate with the foot of the column, trilobed, with curved and rounded lateral lobes; mid lobe is 10 mm. long, fleshy, with a somewhat conduplicate and acute apex; generally dark purple with yellow background; lateral lobes with a 5 mm. long callus, yellow with purple patches. Column with a 3 mm. foot.

Habitat: Epiphyte in cloud forest, especially on thick branches with a moss layer. It requires sunlight, wind exposure and humidity retention.

Flowering season: October to January.

Observations: Three similar species on the same habitat: *M. hematoglossa*, and *M. praestans* and *M. striatopunctatus*. Among this complex there is abundant variation in pseudobulbs, leaves and flower coloration, which leads to confusion. While *M.*

praestans is bigger, we are not clear what is the difference between the others.

Maxillaria curtipes

Hooker 1841

■ **Description:** With an elongate rhizome from which pseudobulbs and inflorescences grow. Rhizome covered with tight, imbricate brown sheaths. Pseudobulbs are green, covered with brown sheaths, 5 cm. long, unifoliate. Leaves coriaceous on the apex of the pseudobulb, 15 cm. long. Inflorescence from axils of the bracts near the base of the pseudobulbs. Flowers are solitary, with a 2 to 4 cm. long peduncle, completely covered with imbricate sheaths. Flowers are fleshy, showy, dark red with yellowish lip and red-brown patches. Dorsal sepal is 25 mm. long and lateral sepal is 22 mm. long; petals are 22 mm. long; the base of the sepals and petals is yellowish with dark red to completely red patches. Lip is 2 cm. long, articulates with the foot of the column, arched in natural position, with rounded apex; disc with an almost black callus and papillose on the lower half. Column is arched, yellow with brown-red patches, 13 mm. long, with a short foot.

Habitat: Epiphyte; in cloud forest.

Flowering season: November and December.

Observations: We have not seen this species; information from Hamer (2001).

Maxillaria densa

Lindl. 1835

■ **Description:** Up to 1 m, with a thick and elongated rhizome. Rhizome with several afoliate pseudobulbs, covered with brown imbricate sheaths. Pseudobulbs are 6 cm. long, unifoliate and spaced, up to 6 cm. long. Leaves are 22 cm. long, conduplicate at the base, green. Inflorescence with a fascicle with up to 20 unifloral peduncles growing from the axils of the new shoot's sheaths. Flowers, 2 cm. in diameter, almost white to pink, purple or dark purple. Dorsal sepal is 12 mm. long and lateral sepal is 11 mm, conduplicate on the apices, adnate to the foot of the column, forming an inconspicuous chin. Petals are 9 mm. long. Lip is fleshy, 5.5 mm. long, adnate to the foot of the column, trilobed, with variable colors; lateral lobes are curved; intermediate lobe is curved; disc with a dark purple or dark brown callus. Column is 3.5 mm. long, with a short and dark purple foot.

Habitat: Epiphyte; in cloud forest.

Flowering season: October to February.

Observations: Numerous flowers growing from the same axil distinguishes this very adaptable species.

Maxillaria diuturna

Ames & Schweinfurth 1925

■ **Description:** Stem completely covered with imbricate sheaths, leaf sheaths are red-brown. Pseudobulbs are unifoliate, 4 cm. long, laterally compressed, spaced from one another, up to 6 to 8 cm. long; base is surrounded with sheaths. Leaves are

13 cm. long, including the short, conduplicate 7 mm. long petiole, dorsally carinate, sheath leaves when present are 10 cm. long. Inflorescence from the axils of the new shoots' sheaths; peduncle is 1 cm. long. Flowers are solitary, yellow-greenish, somewhat red on the basal portion of the lip and column. Dorsal sepal is 15 mm. long, concave, with 9 nerves; lateral sepals are oblique forming a chin. Petals are 12 mm. long, with 3 prominent nerves. Lip is sessile, conduplicate, blade is 11 mm. long, somewhat panduriform, basally cuneate, truncate and retuse on the apex; disc with a wide callus from the base to the middle of the lip; callus is glabrous and rounded. Column is arched, 8 mm. long with a 3 mm. Foot.

Habitat: Epiphyte; grows on dry-tropical forest or semi-dry forest.

Flowering season: January.

Observations: We have not seen this species; information from Hamer (2001).

Maxillaria elatior

(Reichembach) 1844

■ **Description:** Cespitose, with an elongated rhizome from which axial inflorescences grow, with few hidden pseudobulbs. Rhizome is covered with brown conduplicate carinate sheaths. Pseudobulbs are 4 cm. long, laterally compressed, generally with one leaf, covered with sheaths and foliar limbs. Leaves are big, articulate with sheaths, conduplicate at the base, 4 to 20 cm. long, with an obtuse apex, with a short 3 cm. long petiole. Inflorescence from the axils of the leaf sheaths. Peduncle is short, sheathed. Flowers with a thin pedicel ovary, 3 to 4 cm. long, red-brown over an ocraceous background, petals and cener of the lip are darker than the sepals, base of the lip and anterior face of the column are blotchy over a yellow background. Dorsal sepal is 2 cm. long, concave, rounded apex; lateral sepal is 2 cm. long, patent. Petals are arched, 1.9 cm. long, obtuse apex. Articulate lip with the foot of the column, arched in natural position, 1.7 cm. long, curved apex; intermediate lobe is fleshy, acute and verrucose or papillose; disc with a glabrous callus that is dark red from the base to the middle of the lip where it extends on a slightly trilobed apex. Column is arched.

Habitat: Epiphyte in cloud forest.

Flowering season: January to March.

Observations: Habitat is similar to *M. alba*, but the showy red-orange flower is distinctive.

Maxillaria friedrichsthalii

Reichembach 1852

■ **Description:** With creeping rhizome, generally pendant. Pseudobulbs are 5 cm. long, green, compressed, longitudinally surcate, with 3 apical leaves. Leaves are 15 cm. long, conduplicate at the base, obtuse. Axilar Inflorescence of the rhizome sheaths, unifloral with 3 cm. long peduncle, 2 to 6 peduncles per axil. Flowers are green whitish. Sepals are 2 cm. long, carinae, interior, green yellowish, exterior is dark green; very fleshy,

with translucent edges, adnate to the foot of the column, forming a short chin. Petals are 18 mm. long, less fleshy and with the same color as the sepals. Lip articulates with the foot of the column, very fleshy, 15 mm. long, obtuse, trilobed, with curved lateral lobes, dark green with dark brown patches, especially on the edges and apex; disc with a yellow callus that remains wet and sticky. Column is 14 mm. long, with a 4 mm. long foot, green, with a dilated apex.

Habitat: Epiphyte in wet evergreen forest from sea level to 1400 m.

Flowering season: December to February.

Observations: White flowers are relatively abundant and open very little, one of the most common *Maxillaria*, but we have not seen big plants.

Maxillaria fulgens

(Reichembach f.) L.O. Williams 1941

■ **Description:** Robust, branched, up to 1 m long, with twisted roots to 2 mm. thick. Rhizome is up to 1 cm. thick, covered with brown sheaths with foliar limbs and 5 to 8 cm. long. Pseudobulbs are covered with sheaths when young, spread at 20 to 30 cm. intervals, over a secondary stem. Old, bulbs glabrous, with a persistent petiole, up to 3 cm. long. Leaves, acuminate, up to 30 cm., with a bifid apex. fasciculate inflorescence, each flower with a 3 cm. long petiole, covered with three to four scarious sheaths, acuminate; flowers fascicle up to 5 mm. diameter, with up to 50 flowers. Flowers are small, campanulate, fleshy, red; lip and column are yellow; each flower is 7 mm. long. Sepals are sub-acute, concave, fleshy, 5 to 8 mm. long, underside is rugose, the base of the lateral sepals is adnate to the foot of the column. Petals are aovate, sub-acute, trinerved, 5 to 6 mm. long. Lip is fleshy, erect, parallel to the column, with the basal portion adnate to the foot of the column; basal half is deeply excavated, sacciform and forming an inflated chin, 7 mm. long. Column is 3 mm. long, robust.

Habitat: Epiphyte, occasionally terrestrial, in cloud forests.

Flowering season: August and September.

Observations: Survives and produces a few flowers at low altitudes, thrives at 1200 m., occasionally terrestrial, it is uncommon in cloud forest. Its red, bell-shaped flowers are easy to recognize, atypical of *Maxillaria*.

Maxillaria hedwigae

Hamer & Dodson 1982

■ **Description:** Up to 40 cm. tall, approximate pseudobulbs, with plain roots, reddish, up to 10 cm. long; abbreviated rhizome. Pseudobulbs are up to 4.5 cm. long, compressed, with a rugose surface, covered with brown sheaths, unifoliate. Leaves widely ligulate, up to 35 cm. long, channeled, coriaceous, with a 3 cm. long and conduplicate petiole, dorsally carinate, acute. Inflorescence, unifloral from the base of the pseudobulbs, with a rigid peduncle, reddish, thin, 5 cm. long, with four brown bracts. Flowers are showy, patent with white petals, sepals and column, lip is orange with a red-orange callus. Floral bract is

inflated, 1 cm. long, with a reddish apex. Sepals are elliptic, apiculate; dorsal sepal is 18 mm. long. Petals are elliptic, 16 mm. long, with an acute and conduplicate apex. Lip is trilobed near the middle, with erect lateral lobes, acuminate, 13 mm. long; intermediate lobe is oblong, retuse with a verrucose apex; callus is widely spatulate, extends from the base to the middle of the lip, with a triangular apex. Column is robust, 8 mm. long, arched, with a very short foot.

Habitat: Epiphyte; up to 800 m., more common on the Atlantic slope than on the Pacific.

Flowering season: Mainly July to January, occasionally flowers on other months.

Observations: This species easily adapts to cultivation and can form plants to 1 m. Recognizable by its rugose pseudobulbs and the white flower with orange lip.

Maxillaria mombachoensis

Heller ex. Atwood 1981

■ **Description:** Erect, with short rhizome. Pseudobulbs are unifoliate, up to 3.5 cm. long, covered with several brown sheaths, up to 5 cm. long. Leaves are ligulate, dorsally carinate, conduplicate at the base, with a retuse apex, 25 cm. long, with a 1 to 5 cm. long petiole. Inflorescence from the base, up to 12 cm. long, peduncle is covered with three sheaths that are acute, inflated and conduplicate, 3.5 cm. long. Flowers are big; sepals and petals are yellow to orange, white at the bases, lip with a white base and intermediate lobe is light brown. Floral bract is conspicuous, inflated, 3.5 cm. long; surpassing the 2 cm. long pedicel ovary. Dorsal sepal is 3.5 to 4 cm. long; lateral sepal is 3.5 cm. long, with a conduplicate apex. Petals are erect, 3.3 cm. long, forming a cuculla with the dorsal sepal. Lip is trilobed on the lower half, 2 cm. long; lateral lobes are obtuse, short, erect; intermediate lobe is fleshy, sulcate, curved, 1.2 cm. long; disc with a ligulate callus, excavated, obtuse from the base to the intermediate lobe. Column is 8 mm. long with a 3 mm. long foot.

Habitat: Epiphyte; grows at middle altitude forests.

Flowering season: May and October.

Observations: Endemic to Mombacho Volcano. This species requires sunlight and alternation of humidity and dryness. It picks up with fungi and bacterial infections when left wet.

Maxillaria nasuta

Reichembach 1830

■ **Description:** Erect, caespitose, with approximate pseudobulbs and short rhizome. Pseudobulbs are long and compressed, 8 cm. long, covered with sheaths, plain to rugose, unifoliate. Leaves are sub-coriaceous, 30 to 40 cm. long, with white nerves, apex is obliquely retuse, with conduplicate petiole that is 2 cm. long; sheaths with foliar limbs. Inflorescence is unifloral from the axils of the sheaths, peduncle is 5 cm. long with 3 wide inflated sheaths, elliptic. Flowers are big, showy, semi-patent; sepals are green with yellow margins; yellow petals, reddish lip with golden edges and an orange-brown callus. Sepals

are fleshy, acuminate, with conduplicate apices, exterior and interior covered with black patches on the lower halves; dorsal sepal is 3.8 cm. long; lateral sepals are oblique, 3.5 cm. long, without chin, with fleshy base and thin edges. Petals are 2 cm. long, with a fleshy and conduplicate apex. Lip is slightly trilobed in the middle, fleshy with curved inferior edges, 17 mm. long; disc in its lower half with a widely oblong and papillose callus; intermediate lobe with a very thin and linear callus. Column is robust, 10 mm. long, foot is very short.

Habitat: Epiphyte on wet mountains.

Flowering season: September.

Observations: Very big leaves, up to 40 cm. with a big and recognizable capsule that remains with the coriaceous sepals of the acuminate flower for almost a year while it develops. It adapts to cultivation with abundant shade and humidity.

Maxillaria neglecta
(Schlechter) 1866

■ **Description:** Pendant, up to 50 cm. long, with an enlarged 3 mm. Diameter rhizome, covered with brown verrucose sheaths. Pseudobulbs 4 cm. long, are unifoliate, spaced, oblong, compressed, covered with 2 to 3 4 cm. long sheaths. Leaves are acuminate, 20 cm. long. Inflorescence is fasciculate, from the base of the new shoot, up to 10 flowers; peduncle is 2.5 mm. long, with several sheaths, 5 mm. long. Flowers are bell-shaped, cream-white, intermediate lobe of the lip is yellow. Floral bract is carinate, up to 8 mm. long. Sepals are fleshy; dorsal sepal is acute, concave, 5 mm. long; lateral sepal is connate halfway up, forming a sacciform chin with the foot of the column and the lower half of the lip, the flattened lamina is 5 mm. long, obtuse. Petals are ligulate, 5 mm. long and 1.3 mm. wide near the apex, contracted above the middle, sub-acute. Lip is trilobed near the apex, lateral lobes are widely quadrate, forming a tube; lamina of the lateral lobes is 4.5 mm. long; intermediate lobe is fleshy, finely verrucose, widely cordate, adnate to the rest of the lip by a membranous nail, 1.5 mm. long, obtuse, sulcate at the base. Column is short, robust, 2.5 mm. long, with a curved and 5 mm. long foot.

Habitat: Epiphytic in cloud forest.

Flowering season: September.

Observations: We have not seen this species; information from Hamer (2001).

Maxillaria nicaraguensis
(Hamer & Garay) J.T. Atwood 1946

■ **Description:** Up to 60 cm. long, with flexive glabrous roots, with elongated rhizome and stems covered with blackish sheaths, with a retuse apex. Leaves are up to 8 cm. long, mainly on the apical portions. Inflorescence with one to two flowers from the axil of the leaves' sheaths, each flower with its 3 to 5 mm. long peduncle. Flowers are creamy yellow with red stripes in the center of the callus, and the anterior face of the column has brown-orange patches. Sepals with fleshy conduplicate apex, 8 mm. long. Petals are oblique, similar but shorter, with

an acuminate 6mm. apex. Lip is trilobed, rigidly connected to the foot of the column; lower half is erect and parallel to the column; upper half is reflexed; lateral lobes are erect and rigid; intermediate lobe is sub-quadrate, retuse, with wavy, crenulate edges; the entire lip is 8 mm. long; disc with a thickened callus between the lateral lobes; the central nerve is thickened from the base to the base of the intermediate lobe where it ends in a fleshy quadrate callus. Column is arched, sub-nailed, 4 mm. long, edges with thin lateral wings, tight to the column.

Habitat: Epiphyte; grows on cloudy forest.

Flowering season: December.

Observations: We have found this species only once in the canopy of Mt. Musun.

Maxillaria oreocharis
Schlechter 1922

■ **Description:** With elongated rhizome, pseudobulbs at 1 cm., intervals compressed, pale olive green, elliptic, unifoliate, 2.5 cm. long, covered with several brown sheaths, imbricate and truncate. Leaves are acuminate to sub-acute, graminaceous, membranous, very similar to *M. tenuifolia* lindl. Inflorescence is unifloral from the axil of the new shoot sheath. Flowers are showy; sepals with pink stains as fine and red patches; apical lobe is cream as the column, in front of the anther is black-brown. Floral bract is thin, translucent, acuminate, 9 mm. long. Dorsal sepal is contracted near the apex, forming a triangular and acute apex with 9 nerves, patent, lanceolate; lower half is deeply concave, with strongly revolute edges, 15 mm. long; lateral sepals are slightly oblique, connate, forming a conspicuous chin. Petals are tight against the column, with an erect apex, Lip articulates with foot of the column, erect and fleshy, trilobed towards the apex, oblong, with semi-ovate intermediate lobe and a conduplicate and thickened apex; lateral lobes are 12 mm. long; intermediate lobe is 3 mm, finely tuberculate, with a truncate, thickened apex, whitish, with traces of red, red edges. Column is semi-terete, 9 mm. long, including the short columnar foot.

Habitat: Epiphyte; grows on semi-wet areas.

Flowering season: November.

Observations: We have not seen this species; information from Hamer (2001).

Maxillaria pachyacron
Schlechter 1911

■ **Description:** Cespitose, erect, up to 15 cm. tall with an abbreviated rhizome. Pseudobulbs are unifoliate, 2 cm. long, covered with sheaths which are 2 cm. long. Leaves are acute, 10 cm. long. Inflorescence with a single flower from the base of the pseudobulb, erect with a 15 cm. long peduncle, covered with tubular sheaths which are 2.5 cm. long. Flowers are patent, pale brown, acuminate portions of petals and sepals are reddish, lip is brown-yellowish, intermediate lobe is red. Floral bract is as long as the sheaths of the peduncle, but more acuminate. Sepals are largely acuminate; dorsal sepal is 5 cm. long;

lateral sepal is 5 cm., falcate and forming a chin. Lip articulates with the foot of the column, erect with curved edges that form inconspicuous lateral lobes with an acute and triangular apex; intermediate lobe is acute and triangular; disc with a short callus, triangular, in the middle of the lip. Column is 1.5 cm. long, including the elongated and conspicuous foot.

Habitat: Epiphyte in cloud forest canopy.

Flowering season: October.

Observations: Rare and inconspicuous, grows among a thick layer of moss where leaves do not stick out, and only the flowers are conspicuous during the flowering season. Flower is similar to *M. reichembachiana* but leaves without blotches.

Maxillaria paleata

(Reichembach) 1876

■ **Description:** Woody rhizome, branched, with imbricate sheaths and compressed pseudobulbs, almost circular and unifoliate. Leaves are peciolate, acute; the younger branches are covered with densely imbricate sheaths, lanceolate and scarious. Dry flowers have a straw-like color, they grow from the axils of the sepals bracts. Sepal is ligulate-acuminate; lateral sepals form a small chin. Petals are sub-equal; lip is unguiculate and bilobed in the middle, with elliptic and obtuse lateral lobes and a triangular-ligulate intermediate lobe with involute edges; disc with an oblong, callus, channeled, and a sub-acute apex; column with a retuse back lobe, apiculate.

Habitat: Epiphyte; grows in open fields and pastures.

Flowering season: unknown.

Observations: We have not seen this species; information from Hamer (2001).

Maxillaria praestans

Reichembach 1885

■ **Description:** Cespitose, with laterally compressed pseudobulbs, unifoliate, covered with brown sheaths. Leaves are retuse, conduplicate at the base, 20 to 30 cm. long. Lateral Inflorescence of the pseudobulbs, generally two unifloral peduncles, 15 to 20 cm. long, covered with 5 to 6 tight to inflated sheaths. Flowers are variable in size, brillante yellow to yellow-greenish with reddish patches at the base of the sepals, petals and lip. Dorsal sepal is 3 to 5 cm. long, concave; lateral lobe is lanceolate, 3 to 5 cm. long, acute, oblique; petals are 2.8 to 3.5 cm. long. Lip is trilobed, articulates with the foot of the column, naturally arched; intermediate lobe is big, yellow to pale brown; lateral lobes are curved with purple edges, the basal portion of the lip has purple patches; between the lateral lobes there is a ligulate callus, sulcate up to the base of the intermediate lobe; the complete lip is 2.8 to 3 cm. long.

Habitat: Epiphyte or lithophyllic; grows in cloud forest sometimes on rocky walls.

Flowering season: Intermittent throughout the year.

Observations: Bigger than other species of the *M. cucullata*/*M. hematoglossa*/*M. striatopunctata* complex, but variable on sepal coloration.

Maxillaria punctostriata

Reichembach f. 1877

■ **Description:** 35 cm. tall with creeping rhizome. Pseudobulbs, strongly compressed, 6 cm. long, unifoliate. Leaves are ligulate, sub-coriaceous, up to 30 cm. long, attenuate towards the base of the conduplicate petiole, 2 cm. long. Inflorescence is unifloral from the base of the new shoot; peduncle is 10 cm. long with 4 inflated sheaths, 2.5 cm. long. Flowers are ocraceous-yellowish with red-violet stripes and patches on the petals and sepals; mid lobe of the lip is red-black, the apical portion of the callus is red, lateral lobes are red-violet, column on its underside has red patches and orange patches on the foot of the column. Sepals are lanceolate, acuminate, 30 cm.. Petals are shortly elliptic-lanceolate, erect and parallel to the column and the dorsal sepal, 25 mm., acuminate. Lip is trilobed near the middle with obtuse lateral lobes, 2.4 cm.; intermediate lobe is obovate, 11 mm. long, acute, sulcate; disc with a linear and sulcate callus from the base to the base of the intermediate lobe, with rounded apex, fleshy, sulcate and free. Column is nailed and 13 mm.

Habitat: Epiphyte; grows in cloud forest canopy and on isolated remnant trees in open areas that previously were cloud forest. This species requires sunlight, wet roots, and cool temperatures.

Flowering season: Mainly October to December.

Observations: There is variation in color and flower dimensions which leave us very confused in regards to assigning a specimen to *M. punctostriata*, *M. hematoglossa*, or *M. praestans* in the same habitat.

Maxillaria ramonensis

Schlechter 1923

■ **Description:** Cespitose, with a short rhizome, up to 13 cm. tall. Pseudobulbs are compressed, up to 1.5 cm. long, unifoliate. Leaves are acuminate, dorsally carinate, 4 to 12 cm. long, with a 1 to 3 cm. petiole. Inflorescence is unifloral, from the base of the pseudobulbs, peduncle is 1.5 to 2.5 cm. long, covered with three sheaths. Flowers are white with the sepals and petals' apices being red. Intermediate lobe and callus are red. Floral bract is inflated, 1.7 m long, acuminate. Sepals have 11 to 13 nerves, acute to sub-acuminate; dorsal sepal is 9 mm. wide; lateral sepal is oblique, forming a large chin with the foot of the column, 15 mm. long. Sepals are oblique, ligulate, acute to sub-acuminate, 10 mm. long. Lip is trilobed near the apex, 12 mm. long, cuneiform; intermediate lobe are fleshy, obovate, 2.5 mm. long, with erose and fleshy edges; lateral lobes with a rounded apex and slightly irregular edges; disc with a linear-sub-apiculate callus, covered with farinaceous material, from above the nail to the base of the lateral lobes; another callus with five carinae. Column is nailed, 5.5 mm. long, with a thin and 8 mm. foot.

Habitat: Epiphyte; grows in wet areas.

Flowering season: March, September.

Observations: We have not seen this species; information from Hamer (2001).

Maxillaria ramosa

Ruiz & Pav. 1798

■ **Description:** Pendant, up to 2 m long, with enlarged rhizome from which the spaced pseudobulbs grow, these are 5 to 20 cm. apart. Rhizome is thin, covered with dry sheaths, imbricate. Pseudobulbs are rugose, compressed, 3.5 cm. long, unifoliate. Leaves are sub-coriaceous, with an oblique and acuminate apex, abruptly contracted towards the short conduplicate petiole, dorsally carinate, up to 14 cm. long. Inflorescence with one to two flowers from the base of the new shoot; peduncle is thin, 9 m long, with three basal sheaths. Flowers are patent, less than 1 cm. diameter; sepals and petals are ocreaceous; intermediate lobe is white with a yellow disc and a brown callus with red stripes. Floral bract is aovate, acute, less than 1 mm. long, tight. Sepals are ligulate, acute, with three nerves, 6.6 mm. long; lateral sepals are oblique. Petals are falcate, uninerved, with an apicule on the rounded apex, 6 mm. near the apex, 0.5 mm. at the base. Lip is trilobed, mid lobe with four smaller lobes, with finely serrulate edges; lateral lobes are curved, forming a tube on the basal portion, 7 mm. long, above the flattened mid lobe; long; disc with a callus from the base to the apex of the lateral lobes. Column is 3.5 mm. long.

Habitat: Epiphyte in cloud forest.

Flowering season: September.

Observations: We have not seen this species; information from Hamer (2001).

Maxillaria reichenheimiana

Reichembach 1871

■ **Description:** Up to 12 cm. tall, with slightly compressed pseudobulbs, truncate apex, up to 1.7 cm. long, unifoliate. Leaves are shortly elliptic, 11 cm. long including the conduplicate and 1.5 cm. long petiole, abruptly contracted towards an acute apex. Inflorescence with one to two flowers from the new shoot, with a 5 cm. long peduncle and covered with five red-brown sheaths; green peduncle; flowers are slightly open, red-brown with a yellow base. Floral bract is lanceolate, inflated, green-brown, 1.8 cm. long. Sepal is largely acuminate, dorsally carinate, interior is slightly verrucose, exterior is sub-rugose; lateral sepal is 36 mm. long, Petals are falcate, with 7 nerves, contracted underneath the middle, 22 mm. long. Lip is trilobed near the apex, widely elliptic; lateral lobes are erect, 11 mm. long, with an acute and erose apex; intermediate lobe is 2.5 mm. long, fleshy, verrucose, sulcate, sub-acute, aovate with fleshy and crenulate edges; underside of the lip has a wide, verrucose and fleshy callus that ends in a wide apicule that extends beyond the apex of the intermediate lobe; disc is glabrous, with a wide callus, triangular apex.

Habitat: Epiphyte; grows in cloud forest.

Flowering season: October.

Observations: Reported on Mombacho Volcano by several sources even though we have not seen it, in the same habitat as *M. pachyacron* with an almost identical flower.

Maxillaria ringens

Reichembach f. 1863

■ **Description:** Up to 30 cm. tall, with unifoliate pseudobulbs, slightly compressed and covered with imbricate sheaths and acute apices. Leaves are up to 30 cm. long, including the conduplicate, 5 cm. long petiole; apex is sub-acute, obliquely retuse. Several inflorescences, unifloral, generally with 8 to 10 at the same time, with a short peduncle between 1 and 5 cm. long, completely hidden by sheaths. The upper $\frac{3}{4}$ of flowers are yellow; white petals; white lip with red nerves on the lateral lobes; yellow callus with white apex. Floral bract is inflated, 2 cm. long. Sepals are sub-acuminate, dorsally carinate, 5 mm. wide; dorsal sepal is 25 mm. long; lateral sepal is 27 mm. long forming a chin with the foot of the column. Petals are 25 mm. long. Lip is trilobed near the apex, 13 mm. long, with erect lateral lobes; intermediate lobe is aovate with tuberculate edges; lateral lobes are covered with long and soft hairs; disc with a yellow callus from the base to beyond the middle. Column is robust, 7 mm. long, with a thin foot.

Habitat: Epiphyte; in cloud forest.

Flowering season: September.

Observations: Flowers are very similar to *M. brunnea*, which is the more common.

Maxillaria rufescens

Lindley 1843

■ **Description:** With short rhizome. Pseudobulbs are cylindrical, compressed, unifoliate, up to 3 cm. long, covered with sheaths. Leaves are coriaceous, conduplicate at the base, 10 to 30 cm. long, acute, dorsally carinate. Inflorescence is solitary from the rhizome of the new shoot; peduncle covered with few non imbricate sheaths. Flowers are green-yellowish, with red-brown rings; lip has red-brown patches. Sepals are elliptic with curved edges; dorsal sepal is 12 mm. long; lateral sepal is oblique, 13 mm. long, shortly apiculate. Petals are 12 mm. long, with somewhat erose edges. Lip is trilobed below the middle; lateral lobes are erect, porrect and acute; mid lobe is sub-quadrate, slightly panduriform, truncate and retuse on the thickened apex, with a rugose surface; disc with a slightly elevated callus, almost linear from the base to the middle. Column is nailed and with a short foot.

Habitat: Epiphyte in wet forest 800 - 1200 m.

Flowering season: December to March.

Observations: Pseudobulb and leaves are very similar to *M. friedrichstalli*, it has fewer flowers that open more. This species occurs in the same habitat as *M. friedrichstalli* but it is less common.

Maxillaria sanguinea

Rolfe 1895

■ **Description:** Up to 65 cm., plain pseudobulb, round or slightly aovate, compressed laterally, up to 3 cm. long, light green, unifoliate, grows from creeping rhizomes with very short intervals between almost continuous pseudobulbs. Leaves are dark green, up to 30 cm. Flowers are 2.5 cm. Sepals are dark

pink to dark orange, without patches; little variation on the flowers. Lip is wide with a white apical margin changing from pink to dark red afterwards. Short peduncle so that flowers appear hidden around the pseudobulbs.

Habitat: Lithophyllic and Epiphyte in pine forest. We have seen plants of up to 1 m diameter on very exposed rocks.

Flowering season: We have seen it bloom from February to April in cultivation

Observations: This species has not been reported in Nicaragua and we have not seen Nicaraguan plants in flower, but there is no doubt of this species because the plants are very distinctive. Somewhat similar to *M. tenuifolia*, which is more common, but with more consecutive and shorter pseudobulbs and more filiform leaves.

Maxillaria schlechteriana

J.T. Atwood 1994

■ **Description:** Erect to patent, up to 40 cm. tall, with slightly compressed rhizome covered with imbricate sheaths that are 1 cm. apart. Rhizome branched at the base of the pseudobulbs. Pseudobulbs are sub-orbicular, compressed, 2 cm. long; other pseudobulbs are smaller and grow at 10 to 20 cm. intervals; all pseudobulbs are unifoliate. Leaves are coriaceous, lanceolate, acute, from 4 cm. to 13 cm. long, including the conduplicate up to 3 cm. long petiole; sheaths with foliar limbs have wider leaves with erose edges. Inflorescence consists of an imbricate raceme with 2 to 8 flowers following the rhizome of the last pseudobulb; each flower with its peduncle is separate 2 cm. long, from the base of the sheath. Flowers are carmine, tubular, but sepals and petals are free at their patent apical portions. Floral bract is elliptic, purple, 13 mm. long. Sepals are lanceolate, acute, with seven nerves, 17 mm. long. Petals are slightly oblique, lanceolate, with five nerves, 15 mm. long. Lip is rigid, continuous with the foot of the column, erect, fleshy, trilobed, above the middle, 10 mm. long; nail is orbicular, sacciform; intermediate lobe is obovate, 4 mm. long, with a fleshy, acute apex; disc with an oblong callus, tridentate apex. Column is erect, 4 m long, slightly arched.

Habitat: Epiphyte; in dwarf forest.

Flowering season: April to January.

Observations: We found a single plant of this species on Cerro Musun.

Maxillaria sigmoidea

(C. Schweinfurth) Ames & Corell. 1943

■ **Description:** Long 3mm. tick rhizome, ascendant, similar to stems, up to 60 cm. tall, multiple rhizomatic stems grow from the base of one pseudobulb giving the appearance of branchig. Roots are thin, filiform, Pseudobulbs are spaced 10 to 20 cm. apart on the rhizome, unifoliate, elliptic, compressed and rugose, up to 2.2 cm. long besides a persistent 5 mm. long petiole. Leaves are lanceolate, acuminate, membranous, carinate, very variable in size, up to 15 cm., with a conduplicate 3 cm. petiole. Inflorescence is unifloral from the axils; peduncle is 10 mm., covered with 2.5 mm. sheaths. Flowers are slight-

ly campanulate; sepals and petals are wine red, intermediate lobe of the lip is paler, the lower half of the lip has carmine patches, the front of the column has red stripes, anther and pollinia are white. Floral bract is inflated, red-brown, acute, 1 cm. long. Sepals form a tube around the column and lip, acute, 13 mm., with a dorsally carinate fleshy apex. Petals, lanceolate, obliquely acute, 10 mm. long. Lip trilobed above the middle, 10 mm. long; lateral lobes are sub-obtuse, intermediate lobe with a fleshy apex, 3.5 mm. long; disc finely papillose, including the oblong truncate apex that extends from the basal sac to the middle of the lip. Column is erect, 5 mm. long.

Habitat: Epiphyte in wet areas.

Flowering season: April.

Observations: We have only seen this species, in cultivation in Costa Rica.

Maxillaria tenuifolia

Lindl. 1837

■ **Description:** Sub-erect, with creeping rhizome, covered with imbricate sheaths and approximated pseudobulbs, up to 80 cm. long. Pseudobulbs are compressed, obovate to elliptic, unifoliate, up to 3 cm. long. Leaves are acuminate, channeled, sub-coriaceous, up to 50 cm. long. Inflorescence from one of the imbricate sheaths at the base of the pseudobulbs, unifloral, with a 1 cm. long peduncle, covered with sheaths. Flowers are showy, sepals and petals are reddish with yellow patches, mainly on the lower half; lip is pale yellow with red patches. Floral bract is lanceolate, red, 1 cm. long. Sepals are acute, 20 mm. long; lateral sepals are oblique. Petals are lanceolate, slightly oblique, with serrate edges, 19 mm. long, with a slightly reflexed apex. Lip is acute, with slightly crenulate and serrate apical edges, 18 mm. long; disc with an oblong callus on the lower third, slightly expanded and surcate on the obtuse apex. Column is thin, 1.3 cm. long with a short foot.

Habitat: Epiphyte or terrestrial; grows in gallery forest near rivers and sub-montane forest up to 900 m.

Flowering season: April and May.

Observations: This species forms big plants and has a wide distribution on the Atlantic slope of Nicaragua, however, its distribution is very local, forming patchy local populations without being distributed throughout the zone.

Maxillaria tigrina

C. Schweinfurth 1968

■ **Description:** Sub-erect, with creeping rhizome, covered with imbricate sheaths and approximate pseudobulbs, up to 80 cm. long. Pseudobulbs are compressed, obovate to elliptic, unifoliate, up to 3.5 cm. long. Leaves are acuminate, channeled, sub-coriaceous, up to 60 cm. long. Inflorescence from one of the imbricate sheaths at the base of the pseudobulbs, unifloral, with a 1 cm. long peduncle, covered with sheaths. Flowers are showy; sepals and petals are orange with white or yellowish patches, mainly on the lower half; lip is pale yellow with orange patches. Floral bract is lanceolate, red, 1 cm. long. Sepals are acute, 30 mm. long; lateral sepals are oblique. Petals

are lanceolate, slightly oblique with serrulate edges, 25 mm. long, with a slightly reflexive apex. Lip is acute, with slightly crenulate and serrate edges, 22 mm. column is thin, 1.3 cm. long with a short foot.

Habitat: Epiphyte on premontane and gallery forests.

Flowering season: April to May.

Observations: We have found this species which represents a new report for Nicaragua on two occasions, one associated with *M. tenuifolia*. The flower, the pseudobulb and the 50% bigger leaf, with an orange flower distinguish it from the more common *M. tenuifolia*.

Maxillaria uncata

Lindley 1837

■ **Description:** Rhizome covered with several scarious imbricate sheaths. Pseudobulbs 10 mm. long, semi-terete, unifoliate. Leaves are linear, sub-acuminate, coriaceous, channeled, semi-terete, up to 50 mm. long. Inflorescence is solitary from the axils of the new shoot, with a 1 cm. long peduncle and a 5 mm. long sheath at the base. Flowers are whitish with red-brown nerves, column with a reddish callus and nail of the lip. Floral bract is involute, 8 mm. long, pedicel ovary is thin, erect, up to 1.5 cm. long. Sepals are acute, concave underneath the middle, five nerves; dorsal sepal is 11 mm. long; lateral sepal is obliquely triangular-lanceolate, adnate to the foot of the column, forming a conspicuous chin, 16 mm. long. Petals are lanceolate, acute, five nerves, 11 mm. long. Lip is panduriform, forming an orbicular, apical lobe, 4 mm long; $\frac{3}{4}$ basal parts are lateral lobes with a short elongated nail; the complete lip is 16 mm. long; edges are slightly crenulate; disc with a linear, obtuse callus from the nail to the middle of the lip. Column is thin, erect, with a pair of oblong wings on the apex, 13 mm. long, including an arched foot that is 7 mm. long.

Habitat: Epiphyte in wide open pre-montane forest, from sea level to 1000 m., in humid as in very dry areas.

Flowering season: March to November.

Observations: Common and easy to recognize, small plants are common, occasionally grow up to 60-70 cm.

Maxillaria variabilis

Bateman 1837

■ **Description:** with an elongated and creeping rhizome. Rhizome is completely covered with brown sheaths. Pseudobulbs are 2 to 3 cm. long, dark green, unifoliate, covered with sheaths. Leaves are up to 17 cm., obtuse, carinate. Inflorescence is unifloral, axilar from the rhizome sheaths, alongside the new shoot. Flowers are shiny yellow with red patches. Sepals are 1 cm. long, obtuse, with a small apicule, yellow to green-yellowish; lateral sepals with small patches on the inside the base. Petals are 9 mm. long, same color as the sepals, curved. Lip articulates with the foot of the column, 9 mm. long, curved, with curved lateral edges; intermediate lobe is margined, rounded; edges and the apical third are orange yellow; basal third with red-carmine patches; disc with a fleshy, elevated and rounded callus which is dark red or dark purple. Column is 7 mm. long, curved, greenish with red-carmine patches, with a foot.

Habitat: Epiphyte or lithophyllic; grows in the canopy of dense or mixed and cloud forests or under the trunks in open forest.

Flowering season: Mainly on December-January but produces flowers occasionally all year.

Observations: Common and adaptable to cultivation.

Mesadenella tonduzii

(Schlechter) Pabst & Garay 1952

■ **Description:** Short, robust plant. Roots are thick, white, covered with brown hairs, up to 7 cm. long. Leaves are basal, with wavy edges, acuminate, up to 14 cm. long, with a conduplicate and 4 cm. petiole. Floral spike is 18 cm. long, including the 9 cm. long inflorescence; peduncle is red-brown, with several green bracts, base is red and up to 3 cm. long. Flowers with ovary, dorsal sepal and basal portion of the lateral sepals are red-brown; petals and lip are cream, except for the yellow apical portion of the lip. Floral bract is longer than the flower, lanceolate and acuminate, green with red edges, finely pubescent, up to 2 cm. long. Sepals are sub-obtuse, brown, pubescent on the outside, dorsal sepal is 4.2 to 5 mm. long, with three prominent nerves; lateral sepal is connate at the bases forming a chin next to the foot of the column, free portion is 5 mm. long. Petals are 4.5 to 5 mm. long. Lip is spatulate, with three nerves, expanded to form an obovate lamina, sub-acute, 7 mm. long, with two conspicuous auricles, falcate, retuse at the bases, with erect edges, surrounding the column, with reflexed apex and erose edges on the apical half. Column is short, 2.5 mm. long, with a 2.5 mm. long foot, anteriorly pubescent.

Habitat: Terrestrial in tropical evergreen forests.

Flowering season: October, November.

Observations: We have not seen this species in Nicaragua; information from Hamer (2001).

Mesospinidium warscewiczii

Reichenbach 1852

■ **Description:** Cespitose, up to 30 cm. tall. Pseudobulbs are compressed, 5.5 cm. long, with two leaves and several imbricate sheaths with foliar limbs. Leaves are ligulate, abruptly acuminate, with a conduplicate 3 cm. long petiole, dorsally carinate; blade is 25 cm. long. Inflorescence up to 30 cm. long, sometimes longer than the leaf, erect and arched from the sheath axil, branched, each branch with 5 to 8 flowers, rachis is olive green. Flowers are rigid, patent; sepals with red patches; petals with marginal stripes and red patches; apical lobe of the lip with small red patches and a white callus with orange apical teeth. Sepals are concave; dorsal sepal is cucullate, 7.5 mm. long, with conduplicate apex; lateral sepal is fused halfway up, 8 mm. long. Petals are correct, triangular-lanceolate, acute, 7 mm. long. Lip is cuneiform, with retuse apex, when flattened it is truncate with a wide apicule; the apical portion is reflexed; the lip is 10 mm. long, including a 1 mm. long nail; disc with two wide carinae extending from the nail to the middle of the lip, the space between carinae is full of long and white hairs. Column is 6 mm. long, broadly winged.

Habitat: Epiphyte; on wet mountains.

Flowering season: November.

Observations: We have seen this rare local species only between 800 and 900 m. on Mombacho volcano,.

Monophyllorchis microstyloides

(Reichembach) 1962

■ **Description:** Erect, 15 cm. tall, roots fleshy, flexible, elongated, and pubescent. Stem is thin, terete, glabrous, with a long and infundibuliform sheath above the middle, with a leaf at the apex. Leaves are patent, acuminate, somewhat cordiform at the base, 9 cm. long. Inflorescence racemose, erect, 4 to 5 cm. long, with five to six flowers. Floral bract is patent, acuminate, 3 to 4 mm. long; pedicel ovary is up to 10 mm. long. Flowers are dark purple, glabrous. Sepal is acute, attenuate towards the base which is up to 12 mm. long; petals have the same size and shape as sepals; lip is trilobed from the cuneiform base; lateral lobe is obliquely triangular, sub-acute; intermediate lobe is semi-orbicular and obtuse, 15 mm. long and 5 mm. wide over the lateral lobes; disc with three prominent carina on the apical portion. Column is thin, 10 mm. long, winged.

Habitat: Terrestrial in dense cloud forest.

Flowering season: September to January.

Observations: Not common in Nicaragua, we have found it very locally on Maderas Volcano in closed canopy forest. Plants in cultivation have thrived and keep their leaves throughout the year.

Mormodes doderoi

Salazar 2008

■ **Description:** Up to 50 cm. tall; pseudobulbs are oblong, conical, slightly compressed, up to 25 cm. long. Lateral inflorescence is near the base, up to 25 cm. long. Flowers are patent, fleshy, purple to near black. Floral bract is 5 mm. long, tight. Pedicel ovary is dark purple, arched, 2.5 to 3.5 cm. long. Sepals with five nerves, apiculate, slightly concave, with curved edges; dorsal sepal is 9 mm. wide; lateral sepal is 10 mm. wide. Petals with nine nerves, apiculate, 27 mm. long; basal portion with a slight thickening of the central nerve. Lip is coriaceous, sub-orbicular, pilose; lamina is reflexed, conduplicate and curved on the column; disc with a thickened continuation of the nail near the base. Column is 1.5 cm. long, twisted, with acuminate apex.

Habitat: Epiphyte; grows from sea level to 1300 m., in the Atlantic as the Pacific slopes, generally in open forest, fence posts, etc.

Flowering season: January and February.

Observations: Newly described from Costa-Rica and Panama this represents a range extension.

Mormodes horichii

Fowlie 1964

■ **Description:** 35 cm. tall. Pseudobulbs are slightly compressed, up to 10 cm. long, without leaves during the flowering season. Lateral inflorescence from the base of the pseudobulbs,

three to four racemes with a thin peduncle, approximately 20 cm. long, covered with five ovate-acute and 1 cm. sheaths. Floral bract is membranous, acute, 10 mm. long. Flowers are white purple purple, fragrant. Sepal with 5 nerves, slightly revolute edges, apiculate; dorsal sepal is lanceolate, 2.7 mm. long, with a slightly reflexed apex; lateral sepal is reflexed, oblique, widely elliptic-lanceolate, apiculate, 2.5 cm. long, with three conspicuous nerves that form carinae in the interior petal, with two lateral nerves on each side, revolute edges. Lip is fleshy, coriaceous, apiculate, 25 mm. long, with a terete nail, 4 mm. long, widely carinate on the dorsal face, slightly convex above the nail, involute edges over the middle, with a curved apical portion over the column; lamina is sub-orbicular. Column is twisted, 1.8 cm. long.

Habitat: Epiphyte; in semi dry premontane forest from 400-800 m.

Flowering season: February.

Observations: Most common *Mormodes* in Nicaragua, still uncommon. Grows on rotten wood and dead branches, which limits its life span in nature. In cultivation it is very susceptible to cockroaches and other plagues that eat the root shoots. It loses its leaves during the flowering season. Like other *Catacettinae*, flowers are male and female, females being more likely under sunny conditions.

Mormodes horichii ssp. *belleri*

Salazar 2008

■ **Description:** 35 cm. tall. Pseudobulbs are slightly compressed, up to 10 cm. long, without leaves during the flowering season. Lateral inflorescence from the base of the pseudobulbs, 3 to 4 racemes with a thin peduncle, approximately 20 cm. long, covered with five ovate-acute 1 cm. sheaths. Floral bract is membranous, acute, 10 mm. long. Flowers are uniform lemon yellow, fragrant. Sepal with five nerves, slightly revolute edges, apiculate; dorsal sepal is lanceolate, 2.7 mm. long, with a slightly reflexed apex; lateral sepal is reflexed, oblique, widely elliptic-lanceolate, apiculate, 2.5 cm. long, with three conspicuous nerves that form carinae in the interior petal, with 2 lateral nerves on each side, revolute edges. Lip is fleshy, coriaceous, apiculate, 25 mm. long, with a terete nail, 4 mm. long, widely carinate on the periside, slightly convex above the nail, involute edges over the middle, with a curved apical portion over the column; lamina is sub-orbicular. Column is twisted, 1.8 cm. long.

Habitat: Epiphyte; in semi dry premontane forest from 400-800 m.

Flowering season: February. March

Observations: Endemic to Mombacho Volcano.

Mormodes skinneri

Reichembach

■ **Description:** 25 cm. tall. Pseudobulbs are slightly compressed, up to 10 cm. long, without leaves during the flowering season. Lateral inflorescence from the base of the pseudobulbs, 3 to 4 racemes with a thin peduncle, approximately 16 cm.

long, covered with five ovate-acute sheaths, 1 cm. long. Floral bract is membranous, acute, 10 mm. long. Flowers are cream with several fine purple-pink patches. Sepal with five nerves, slightly revolute edges, apiculate; dorsal sepal is lanceolate, with a slightly reflexed apex; lateral sepal is reflexed, oblique, widely elliptic-lanceolate, apiculate, 2.5 cm. long, with three conspicuous nerves that form carinae in the interior of the petal. Column is twisted, 2 cm. long.

Habitat: Epiphyte in wet and evergreen forest, in open spaces at low altitudes.

Flowering season: January to March.

Observations: New report for Nicaragua, rare species in San Juan River on the Costa Rican border in the Guatuzos.

Mormodes sotoana

Salazar 1992

■ **Description:** 25 cm. tall. Pseudobulbs are slightly compressed, up to 12 cm. long, without leaves during the flowering season. Lateral inflorescence from the base of the pseudobulbs, three to four racemes with a thin peduncle which is 15 to 20 cm. long, covered with five ovate-acute sheaths that are 1 cm. long. Floral bract is membranous, acute, 10 mm. long. Flowers are white to purple. Sepals with dark longitudinal nerves, edges are slightly revolute, apiculate; dorsal sepal is lanceolate, 2.7 mm. long, with a slightly reflexed apex; lateral sepal is reflexed, oblique, widely elliptic-lanceolate, apiculate, 2.5 cm. long, with three conspicuous nerves. Lip is fleshy, coriaceous, apiculate, 25 mm. long, with a terete and 4 mm. nail. Column is twisted, 2 cm. long.

Habitat: Epiphyte in open broad-leaf forest, from sea level to 600 m.

Flowering season: January and February.

Observations: Rare species in Nicaragua and a new report for the country; we have seen solitary specimens amid populations of other *Mormodes*. The dark carinae on the sepals are the most significant trait to distinguish it from *M. horichii*.

Mormolyca ringens

(Lindley) Schlechter 1914

■ **Description:** With a very short rhizome, up to 25 cm. long, erect. Pseudobulbs are slightly compressed, with truncate apex, up to 3.5 cm. long, with few rigid sheaths at the base, unifoliate. Leaves are coriaceous, ligulate, with a sub-acute conduplicate petiole, very short, up to 20 cm. long. Flowers with green yellowish sepals, petals and lower half of lip, with red brown stripes, the apical half of the lip is red brown, central callus is red, with triangular red patches at the base of the lip. Floral bract is 10 mm. long. Sepals with five nerves; dorsal sepal is concave, elliptic, with an acuminate and conduplicate apex, 15 mm. long; lateral sepal is oblique, acute, with curved edges, 13 mm. long. Petals are erect, curved, shortly elliptic, with five nerves, 13 mm. long. Lip is trilobed, widely elliptic; surface and edges are pubescent, 9 mm. long, over the flattened lateral lobes; fleshy apex, retuse and rounded; intermediate lobe is 5

mm. long; disc with a short callus, shortly tridentate in the center of the disc.

Habitat: Epiphyte; grows in pre montane forests.

Flowering season: August and November.

Observations: We have seen this species on Volcan Mombacho where it is rare.

Myoxanthus octomeriae

(Schlechter) 1922

■ **Description:** Erect, up to 30 cm. tall, rhizome covered with hairs, new shoots with purple hairs. Secondary stems are rigid, unifoliate, thickened at the base, covered with 4 scarious sheaths, white. Leaves are coriaceous, sessile, up to 12 cm. long, with retuse apex. Fasciculate inflorescence, 1 to 10 flowers from the base of the leaf. Flowers are fleshy, cream, sepal apex is yellow. Floral bract is infundibuliform, ciliated. Dorsal sepal is 7 mm. long; lateral sepal is connate near the base, forming a chin. Petals are trinerved, 2 mm. long. Lip is fleshy, shortly unguiculate, sulcate, 2.5 to 3 mm. long, with obtuse apex; disc with fleshy and brown lateral carinae from underneath the middle and converging towards the apex, the portion between the carinae is verrucose. Column is short and 2.5 mm. long, with a 1.3 mm. long foot and lateral teeth on the apex.

Habitat: Epiphyte; in cloud forest.

Flowering season: September to October.

Observations: Short flowering season very synchronized, not common, it adapts very well to cultivation.

Myoxanthus scandens

(Ames) Luer 1982

■ **Description:** Erect, up to 1 m with aerial roots on the leaf nodes at 15 to 20 cm. intervals where 8 or more leaves grow. Secondary stems are rigid, unifoliate, thickened at the base, covered with four scarious sheaths, white. Leaves are coriaceous, sessile, up to 7 cm. long, acutely lanceolate, coriaceous, conduplicate. Fasciculate inflorescence, 1 to 3 flowers from the base of the leaf. Flowers are fleshy, cream with diffuse purple. Floral bract is infundibuliform, ciliate. Dorsal sepal is 4 mm. long; lateral sepal is 4 mm. long, yellow to creamy. Lip is fleshy, very small, yellowish, 1 mm. long, with an obtuse apex; disc is sub-quadrate. Column is short and 2.5 mm.

Habitat: Epiphyte in low altitudes and wet forest.

Flowering season: December.

Observations: This inconspicuous species in convergent with bamboo, especially with the fine and creeping bamboo species in wet forest.

Myoxanthus speciosus

(Luer) Luer 1982

■ **Description:** Erect, up to 30 cm. tall, rhizome covered with hairs, new shoots with purple hairs. Secondary stem are rigid, unifoliate, thickened at the base, covered with four scarious

sheaths, white. Leaves are coriaceous, sessile, up to 12 cm. long, with retuse apex. Fasciculate inflorescence, 1 to 5 flowers from the base of the leaf. Flowers are fleshy, cream, sepal apex is yellow. Floral bract is infundibuliform, ciliated. Dorsal sepal is 7 mm. long; lateral sepal is connate near the base, cream-yellowish, fleshy, and cylindrical. Petals are 2 mm. long. Lip is fleshy, wide, yellow with diffuse purple, 6 mm. long, with an obtuse apex; disc is dark purple. Column is short and 2.5 mm. long, with a 1.3 mm. long foot and lateral teeth on the apex.

Habitat: Epiphyte in Atlantic rain forest.

Flowering season: December.

Observations: Big, wide lip with tubiform sepals that characterize the flower.

Myoxanthus trachychlamys

(Schlechter) Luer 1982

■ **Description:** Creeping rhizome, up to 10 cm. tall. Secondary stems are thin, unifoliate, up to 5 cm. long, covered with 3 to 4 white sheaths, hispid. Leaves are coriaceous, dorsally carinate, with retuse apex, 4 to 6 cm. long. fasciculate Inflorescence from the base of the leaf, very short, one to three flowers. Flowers are patent, cream at the apex, flowers yellow-orange petals. Floral bract is 1.5 mm. long, finely ciliated. Sepals with five nerves, sub-acute, 6 mm. long. Petals are 6 mm. long, with the basal portion abruptly dilated, apical portion is linear with serrate edges. Lip is oblong, with a pair of lateral teeth near the middle, with rounded apex, 2 mm. long. Disc with a thickened and arched callus above the nail. Column is 2 mm. long, with a 1.5 mm. Foot and three teeth on the apex.

Habitat: Epiphyte; grows in wet areas.

Flowering season: April to August.

Observations: We have not seen this species; information from Hamer (2001).

Myrmecophila brysiana

(Lem) 1851

■ **Description:** up to 1 m tall. Pseudobulbs are fusiform, elongated, attenuate towards the apex, bifoliate, up to 35 cm. long. Leaves are coriaceous up to 15 cm. long. Inflorescence up to 1 m., partially covered with tight sheaths that are 1.5 to 2 cm. long; peduncle 4 to 5 mm. in diameter; successive flowers. Flowers are intense yellow, orange lamina on the throat, violet patches on the intermediate lobe; white column with yellow base. Floral bract is triangular, acute, 5 cm. long. Sepals are oblanceolate, with 7 nerves, wavy edges, verrucose, apiculate apex, 3.5 cm. long. Petals are shortly unguiculate, with green apex, apiculate with wavy edges, 3.5 cm. long, dorsally surcate, five nerves. Lip is trilobed past the middle, 4 cm. long and 4.3 mm. wide over the flattened lobes; lateral lobes are long, sub-truncate in front of the intermediate lobe, convolute in natural position surrounding the column; intermediate lobe is small, transversely elliptic, slightly retuse, with crenulate edges, 1 cm. long; disc with seven low keels on the basal third that join to form three parallel carinae to the intermediate lobe. Column is 2 cm., arched.

Habitat: Epiphyte fringing the Atlantic coastal, along lagoons and rivers, especially on mangroves, jicaro and mango trees.

Flowering season: January to April.

Observations: Some taxonomists group the Genus with *Laelia*, but we maintain the separation as valid based on the hollow pseudobulbs which host aggressive ants.

Myrmecophila christinae

Carnevali & Gomez- Juarez 2001

■ **Description:** Up to 1 m tall. Pseudobulbs are fusiform, elongated, attenuate towards the apex, bifoliate, up to 30 cm. long. Leaves are coriaceous up to 15 cm. long. Inflorescence up to 1 m., partially covered with tight sheaths that are 1.5 to 2 cm. long; peduncle 4 to 5 mm. in diameter; successive flowers. Flowers are intense yellow, orange lamina on the throat, violet patches on the intermediate lobe; white column with yellow base. Floral bract is triangular, acute, 5 cm. long. Sepals are oblanceolate, with 7 nerves, wavy edges, verrucose, apiculate apex, 3.5 cm. long. Petals are shortly unguiculate, with green apex, apiculate with wavy edges, 3.5 cm. long, dorsally surcate. Lip is trilobed past the middle, 4 cm. long and 4.3 mm. wide over the flattened lobes; lateral lobes are long, sub-truncate in front of the intermediate lobe, convolute in natural position surrounding the column; intermediate lobe is small, transversely elliptic, slightly retuse, with crenulate edges, 1 cm. long; to the intermediate lobe. Column is 2 cm., arched.

Habitat: Epiphyte fringing the Atlantic coastal, along lagoons and rivers, especially on mangroves, jicaro, and mango trees.

Flowering season: January to April.

Observations: This species was recently described from Mexico, and is a new report for Nicaragua; it is less common than *M. brysiana*, but often grows in the same tree.

Myrmecophila tibicinis

(Batem.) Rolfe 1917

■ **Description:** Erect, up to 2 m tall, with fusiform pseudobulbs, elongated, hollow, attenuated towards the apex, up to 40 cm. long with three to four apical leaves, coriaceous and rigid. Inflorescence with a multifloral panicle with an elongated floral scape, purple and with 15 tight sheaths that are 5 cm. long. Flowers are patent, with wavy red-purple sepals and petals; yellow callus. Floral bract is triangular, 1.5 cm. long. Sepals are acute; dorsal sepal is oblong-ligulate, 4 to 4.5 cm. long; lateral sepal is oblique, 4.5 to 5.5 cm. long. Petals are acute, oblanceolate, 4.3 cm. long. Lip is conspicuously trilobed over the middle, 4.7 cm. long over the flattened lateral lobes; lateral lobes are widely rounded, convolute in natural position, surrounding the column; intermediate lobe is cuneiform, deeply retuse, 2.2 cm. long, including the isthmus; disc with 5 to 7 slightly elevated carinae from the base to the middle of the intermediate lobe. Column is arched, 2.7 cm. long, with an excavated foot.

Habitat: Epiphytic or lithophyllic in sunny areas, mainly in dry or premontane forest, from 50 to 600 m.

Flowering season: March.

Observations: It grows to form large plants of 3 m or more, on the thick branches of the Ceiba tree.

Myrmecophila wendlandii

(Reichembach f.) G.C. Kenn 1979

■ **Description:** With hollow pseudobulbs, cylindrical, yellowish, when young they are green, 20 cm. long, bifoliate. Leaves are green, 20 cm. long, coriaceous. Terminal Inflorescence, 50 cm. long, panicle, with up to 25 flowers. Flowers are brown with a cream lip. Sepals are 25 mm. long, brown to brown-purple, with yellow apex and base. Petals are 24 mm. long, same color, yellow edges, spatulate. Lip resupine, cream with purple nerves and patches, trilobed; lateral lobes are curved, wavy edges and with purple patches; between lateral lobes and up to the middle of the intermediate lobe are 3 elevated carinae. Column is 10 mm. long, white-greenish with purple stripes and patches.

Habitat: Epiphyte or lithophyte, in areas of prolonged dryness and abundant heat; from 600 to 1000 m.

Flowering season: December to February.

Observations: This species requires a resting period and if it is abundantly watered when the shoots are growing, these are especially vulnerable. It grows as big plants but there is little variation in the size of the pseudobulbs.

Nidema boothii

(Lindley) Schlechter 1922

■ **Description:** With creeping rhizome. Pseudobulbs are compressed, unifoliate, 2.5 to 6 cm. long, when young are covered with lanceolate sheaths. Leaves are linear, sub-acute, up to 15 cm. long. Inflorescence with a raceme of two to four flowers. Flowers are patent, yellow-cream with a yellow disc. Floral bract is lanceolate, conduplicate, acuminate, 3 cm. long, pedicel ovary is 2 mm. long, covered with black glandular protuberances. Sepals are acuminate, with fleshy and conduplicate apex; dorsal sepal is carinate, 16 mm. long; lateral sepal is 16 mm. long, with curved apices. Petals are abruptly contracted to form a shortly acuminate apex, 11 mm. long. Lip is arched, with a round apex, thin edges, white, finely serrate, 9 mm. long; disc thickened from the base to near the apex to form a bifid, surcate callus on the basal third; the entire callus is verrucose. Column is arched and 6 mm. long.

Habitat: Epiphyte, from 0 to 1400 m., in wet to semi-dry forest.

Flowering season: October and November.

Observations: Creeping species that develops big plants, up to 1 m diameter with very uniform pseudobulbs and leaves.

Nidema ottonis

(Reichembach f.) Brito. & Millsp. 1920

■ **Description:** Up to 20 cm. long, with strong rhizomes and pseudobulbs. Pseudobulbs are somewhat compressed, stipate and attenuate towards the apical portion, unifoliate, up to 4 cm. long; the new pseudobulbs are covered with scarious sheaths, imbricate. Leaves are linear, 11 cm. long, complicat-

ed at the base, shortly petiolate. Terminal inflorescence, thin, shorter than the leaves, with 1 to 3 successive flowers, peduncle is covered with acuminate sheaths, 1 to 1.5 cm. long. Flowers are white with two short and purple stripes in the center of the lip. Floral bract is 11 mm. long, acuminate, pedicel ovary is 9 mm. long, shorter than the bract. Dorsal sepal is 8 cm. long, acuminate; lateral sepals are falcate, 9 mm. long. Petals are 6.5 mm. long, oblique and sub-acute. Lip is adnate to the base of the column, very fleshy, acuminate, sulcate, 7 mm. long; disc with a pair of fleshy calli that are 2.5 mm. long on the basal third. Column is short, 4.5 mm. long, apex with 5 dentate lobes.

Habitat: Epiphyte; in rain forest and premontane forest.

Flowering season: November, December.

Observations: Less common than *N. boothii* on the same habitat, this has almost cleistogamous flowers and at wider intervals between the pseudobulbs which makes it appear less dense.

Notylia pentachne

Reichembach f. 1854

■ **Description:** Up to 20 cm., with pendant racemes that are 8 cm. long. Pseudobulbs are oblong, compressed, unifoliate, 1.2 cm. long, covered with sheaths that have foliar limbs. Leaves are ligulate, apiculate lanceolate, to 20 cm. long 4 cm. wide, including the conduplicate and 1 cm. long petiole. Pendant Inflorescence from the axil of a sheath, densely multi flowered, 8 cm. long, including the 2 cm. long petiole. Flowers are patent, greenish white with one orange spot on each petal. Floral bract is acuminate, 1.5 to 3 mm. long. Sepals with four nerves, curved edges, 6 mm. long; dorsal sepal is 2.1 mm. wide; lateral sepal is oblique, with falcate apices, 1.8 mm. wide. Petals are trinerved,. Lip with a 1 mm. long nail, convex and conduplicate, papillose on the surface, acuminate, with revolute edges, 4 mm. long. Column is terete, papillose, curved at the apex, 3 mm. long.

Habitat: Epiphyte on thin branches, preferably on citrus located in lowlands up to 700 m., it grows in the Atlantic slopes.

Flowering season: November to March.

Observations: Similar to *N. trisepalum*, but larger leaves, column papillose, not glabrous, single orange spot on each petal.

Notylia trisepala

Lindl. 1852

■ **Description:** Up to 13 cm. tall, with a pendant raceme that is 6 cm. long. Pseudobulbs are oblong, compressed, unifoliate, 1.2 cm. long, covered with sheaths that have foliar limbs. Leaves are ligulate, apiculate and attenuate towards the base and the apex, dorsally carinate, 14 cm. long, including the conduplicate and 1 cm. long petiole. Pendant Inflorescence from the axil of a sheath, densely multi flowered, 6 cm. long, including the 2 cm. long petiole. Flowers are patent, white, with four orange patches on the petals. Floral bract is acuminate, 1.5 to 3 mm. long. Sepals with 4 nerves, curved edges, 6 mm. long; dorsal sepal is 2.1 mm. wide; lateral sepal is oblique, with falcate apices, 1.8 mm. wide. Petals are trinerved, with a short

fleshy nail. Lip with a 1 mm. long nail, convex and conduplicate, papillose on the surface, acuminate, with revolute edges, 4 mm. long. Column is terete, glabrous, curved at the apex, 3 mm. long.

Habitat: Epiphyte on thin branches, preferably on citrus located in lowlands up to 700 m., it grows in the Atlantic and the Pacific slopes.

Flowering season: November to March.

Observations: Even though it has a broad distribution, the populations are very local and somewhat disperse. It seems to be an obligatory epiphyte on small branches. Even though plants look like small *Trichocentrum*, it has fine roots and does not grow on thick stems.

Octomeria costarricensis
Schlechter 1923

■ **Description:** Considerable variability in size, 15 to 40 cm. tall, with creeping rhizome, from which stems grow at 8 to 15 mm. intervals. Stems are rigid, unifoliate, 7 to 16 cm. long, covered with three to five scarious sheaths. Leaves are coriaceous, tridentate on the apex, 9 to 19 cm. long. Fasciculate inflorescence, from the base of the leaf, with 3 to 10 successive flowers. Flowers are cream-yellowish, sepal apices and lip are yellow. Floral bract is 2 mm. long, brown, scarious. Sepal is trinerved, concave, outside glandular, 4.5 to 6 mm. long; apical portion is curved and fleshy. Petals are uninerved, concave, attenuate towards the base, 4.9 to 6 mm. long. Lip is trilobed on the lower half, 3 to 3.3 mm. wide, trinerved; apical edges are erose; truncate and tridentate apex; fleshy disc on the lower half, with two elevated and triangular calli that extend to the intermediate lobe. Column is arched, 2 cm. long, with a short foot and a tridentate apex.

Habitat: Epiphyte on exposed trunks in the cloud forest canopy.

Flowering season: July and October.

Observations: It survives, but with difficulty, out of its natural environment. In our experience it is not very common.

Octomeria graminifolia
(L.) R. Br. 1813

■ **Description:** Creeping, up to 6 cm. tall, with roots along the elongated rhizome. Secondary stems are 1.5 cm. long, covered with scarious sheaths that are shed after 2 years. Leaves are very thick, coriaceous, carinae, 3.2 cm. long, with an acute conspicuous apex. Inflorescence from the base of the leaf, unifloral. Flowers are green-whitish, patent, 6.5 mm. long, with a 3 mm. floral bract. Sepals are 6.5 mm. long, trinerved, acuminate; lateral sepal is free up to the base. Petals are almost as long as the sepals. Lip is trilobed near the base, truncate apex, with small teeth; lateral lobes are thin and orbicular; disc with a conspicuous callus on each side of the lip; apical portion has a verrucose and oblong thickening. Column is thin, 2 mm. long, thickened towards the base, with a short foot; anthers with two groups of four white pollinia.

Habitat: Creeping Epiphyte cloud forest canopy.

Flowering season: Unknown.

Observations: We have found this species only once in Maderas Volcano.

Oeceoclades maculata
(Lindley) Lindl. 1833

■ **Description:** Up to 25 cm. with fleshy roots that are up to 15 cm. long; leaf with a rounded pseudobulb, compressed, up to 2 cm.; leaves are lanceolate, up to 20 cm., coriaceous, plain dark green with white transverse marbling. Floral stem from the base, up to 25 cm. tall, with up to 12 successive flowers. Flowers are white with pink lip. Sepals are oblanceolate, brown to pale green; lip is subquadrate, 1.2 cm., with two lateral lobes near the base, white with pink lateral patches; lateral lobes with parallel and longitudinal purple lines. Column is 1.3 cm. long.

Habitat: Terrestrial or, lithophylli in dry forest to humid swamps and closed forest.

Flowering season: June to August.

Observations: Originally African the species has invaded Central America rapidly and very successfully, adapting to different environments; in fact, we found an epiphytic plant on a palm tree. It is not going to take very long for this species to establish itself as the most abundant terrestrial species in Nicaragua.

Oerstedella aberrans
(Schlechter) 1918

■ **Description:** Erect, to 60 cm. tall, branched, with long and thick roots on the branch nodes. Stems are robust with apical leaves covered with rugose, verrucose and maculate sheaths the first year. Leaves are dictic, patent, 1.5 to 6 cm. long, acute, membranous. Raceme inflorescence, up to 10 cm. long, including the 1.5 cm. long peduncle. Flowers, sepals and petals are pink, lip has the same color as the white and yellow nail. Floral bract is triangular-ovate, 2 mm. long, pink pedicel ovary, thin and arched, 2.5 cm. long. Sepals with five nerves that are 11 mm. long, slightly concave, reflexed apices; dorsal sepal is ligulate; lateral sepals are oblique, acute. Petals are spatulate, 10 mm. long, with three nerves, obtuse. Lip is trilobed, adnate to the basal parts of the column; lateral lobes are semi-patent, 4 mm. long, obtuse; intermediate lobe is bilobed, with a 3 mm. long isthmus; lobes are erect, truncate, 2.5 mm. long, with a retuse apicule on the sinus; disc with an oblong and bifid callus between the lateral lobes. Column is thin, tubular, slightly contracted at the base and over the middle, with crenulate and deeply retuse apical edges, 7 mm. long; apex with two fleshy wings on the front, rostellum is very low inside the column.

Habitat: Epiphyte; in cloud forest.

Flowering season: October to January.

Observations: We have not seen this species; information from Hamer (2001).

Oestlundia luteorosea

(A. Rich. & Gal.) W.E. Higgins 2001

■ **Description:** Flat pseudobulbs covered almost completely with scaly sheaths that fall off with age leaving behind rings, with three to four leaves. Leaves are green, 20 cm. long, shortly linear and acuminate. Inflorescence is 25 cm. long, paniculate with up to 15 flowers. Peduncle is thin, green, with whitish sheaths, 1 mm. long base, smaller towards the apex. Flowers are green-yellowish and brown. Sepals are 9 to 11 mm, yellow background with purple spots to the apex. Petals are 10 mm. long, same color as sepals, largely attenuated to the base, spatulate. Lip is 10 mm. long, adnate to the basal half of the column, yellow or green-yellowish with purple spots. Disc with two wide 3 mm. calli, violet. Column is 5 mm, dark green, wide and with two ascendant auricles on the apex; anthers are white with few violet spots.

Habitat: Epiphyte; in cool mountains

Flowering season: April to June

Observations: We have seen isolated individuals of this plant around 900 m., easily recognized by the ringed pseudobulbs.

Oncidium bracteatum

Warcz. & Reichenbach f. 1852

■ **Description:** Compressed pseudobulbs, surcate, 6 cm. long. Leaves are apical, 20 cm. long, obtuse, strongly carinate. Lateral inflorescence with racemes having 2 to 10 flowers but may have up to 30 flowers and measure up to 1.5 m long; peduncle is green with purple patches. Flowers are 3.5 cm. in diameter. Sepals are green-yellowish with brown patches, dorsally carinate, 21 mm. long, with curved edges; petals are 21 mm. long and have the same color. Lip is unguiculate, 16 mm. long with curved lateral edges; the lower half is 4 mm. wide, white with red-purple to violet patches; upper half is curved, very dilated, up to 7 mm wide and white; apex is curved and acute, with finely dentate edges; disc with 4 longitudinally inconspicuous calli on the basal portion. Column is 7 mm. long, white, with or without two wings or auricles, which are short and wavy on the apex.

Habitat: Epiphyte; in cloud forest 1000 m. or above.

Flowering season: April to July.

Observations: Pseudobulbs and leaves are similar to *Oncidium stenotis* in the same habitat, but normally does not have more than a pair of pseudobulbs and a floral raceme that does not have several simultaneous flowers but keeps flowering for a couple of months with few successive flowers.

Oncidium cheiroporum

Reichenbach 1852

■ **Description:** Cespitose, up to 30 cm. tall. Pseudobulbs are plain, dark green with brown-black patches, covered with several sheaths that have foliar limbs. Leaves are acute, 10 cm. long, filiform. Inflorescence, approximately the double the leaf length, branched. Flowers are dark yellow with reflexed petals and sepals. Floral bract is acute, 2 mm. long. Sepals are tri-

nerved, sub-obtuse, 5 mm. long, concave; dorsal sepal is 3 mm. wide; lateral sepal is falcate, oblanceolate, 2.3 mm. wide. Lip is 8 mm. long, trilobed; lateral lobes are rounded with revolute edges, 4 mm. long; upper edges with fleshy wings, sometimes verrucose; intermediate lobe is cuneiform, retuse, 3 mm. long; disc with a 3 mm. fleshy callus, and 4 teeth. Column is 4 mm. long, with conspicuous wings, generally dolabriform, 2 mm. long and a base equipped with a conspicuous fleshy horn.

Habitat: Epiphyte in wet and sunny areas, from 1000 to 1300 m.

Flowering season: January.

Observations: flowers Small and only persisting for one week. Sepals and petals are so reflexed that it is difficult to take pictures of them.

Oncidium cheiroporum var *exauriculatum*

Hamer & Garay 1974

■ **Description:** With 4 cm. long pseudobulbs, green, compressed, angular, unifoliate, covered with dictic sheaths, partially with foliar limbs. Leaves are apical, articulate with sheaths, conduplicated at the bases, acute or acuminate, dorsally carinate, 17 cm. long. Lateral inflorescence, multifloral panicle with 10 flowers, 20 cm. long, green peduncle, with 1 to 2 mm. long sheaths. Flowers are yellow, without patches, 12 mm. long. Sepals are reflexed, 5 to 5.6 mm. long, concave, trinerved, yellow and rounded on the apex. Petals are reflexed, truncate, 5.5 mm. long, yellow. Lip is 12 mm. long, yellow; lateral lobes are wide and truncate; intermediate lobe is small and marginate on the apex, with wavy edges; between the lateral lobes there are 2 fleshy calli, triangular and a tridentate callus elevated in the middle. Column without characteristic auricles, angular, underneath the stigma there is a curved horn, erect and somewhat bilobed on the apex.

Habitat: Epiphyte; in wet mountains.

Flowering season: December and January.

Observations: We have not seen this variant.

Oncidium ensatum

Lindley 1842

■ **Description:** Up to 2.5 m tall with its inflorescence. Pseudobulbs are up to 16 cm. long, very compressed, longitudinally channeled, pale green, bifoliate, bases covered with imbricate sheaths having foliar limbs. Leaves are erect, long and acute, approximately 60 cm. long, sub-coriaceous, dorsally carinate. Peduncle forms the base of the pseudobulb, robust, with purple patches, 2 m long, including the multifloral panicle, covered with several acute lanceolate bracts that are 1 to 1.5 cm. long. Flowers are yellow, generally with olive brown patches around the callus and over the sepals and petals. Sepals and petals are patent, with a short nail, with wavy edges; sepals are acute on the curved apex, 13 mm. long; lateral sepals are falcate and conspicuously carinate. Petals are acute and 12 mm. long. Lip is widely panduriform, trilobed, 15 mm. long;

lateral lobes are inconspicuous, rounded; intermediate lobe is separated from the lateral lobes by a wide and long isthmus, emarginate, with an apicule on the sinus; fleshy callus, 5 mm. long, with 5 elevated and elongated tubers and a bifurcated tuber on each side of the base. Column is short, fleshy, with two wide crenulate wings on either side of the apex.

Habitat: Epiphyte or terrestrial in dry rocky soil.

Flowering season: January to May.

Observations: We found this species in pine forest of the Cordillera de Dipilto.

Oncidium guttulatatum

Reichembach f. ex. Lindl. 1855

■ **Description:** With elongate-oblong pseudobulbs, compressed, ancipitals, 9 cm. long, bifoliate. Leaves are coriaceous, 18 cm. long. Inflorescence is paniculate, multi flowered, 50 to 60 cm. long, with 5 to 10 cm. long branching and up to 6 flowers. Floral bract is conspicuous, acute, concave, 6 mm. long. Sepals are free, wavy, 14 mm. lip is shortly unguiculate; lateral lobes are short and rounded; intermediate lobe is bilobed and 1.2 mm. wide; the complete lip is 1.5 cm. long; disc with a pubescent callus with three conspicuous apical teeth. Column is 6 mm. long, slightly curved, with two short wings.

Habitat: Epiphyte; grows on wet areas in the Atlantic Coast.

Flowering season: unknown.

Observations: This species is recently reported near San Juan del Norte – Indio Maíz, but we have not seen it.

Oncidium incurvum

Barker ex. Lindl. 1840

■ **Description:** Aovate to oblong compressed pseudobulbs, generally with three elevated carinae, with two apical leaves on young samples and with sheaths having foliar limbs at the base. Leaves are acute, up to 45 cm. long. Inflorescence from the axil of the leaf sheaths, flexive, up to 2 m long, paniculate, with dictic and alternate branches. Flowers are fragrant, white with pink to pale purple patches. Sepals and petals are acute to acuminate, edges wavy; lip is trilobed; lateral lobes are small and rounded to obtuse; intermediate lobe is dilated, up to 8 mm. wide, leaving between it an elongated and short isthmus; lamina of the intermediate lobe is retuse, white; callus with a yellow disc that has five teeth. Column is short, slightly winged, white.

Habitat: Epiphyte in wet areas.

Flowering season: February.

Observations: We have not seen this species; information from Hamer (2001).

Oncidium maculatum

(Lindley) Lindl. 1841

■ **Description:** With compressed pseudobulbs, approximately 6 cm., bifoliate, sheaths with foliar limbs cover the base. Leaves

are ligulate, sub- coriaceous, 16 cm., conduplicate at the base, dorsally carinate. Lateral inflorescence of the pseudobulbs, up to 50 cm.; peduncle is 25 cm., with tight sheaths; rachis with 5 to 10 showy flowers, yellow with red-brown patches; lip is white turning yellow with age, red brown patches around the callus. Floral bract is 4 mm; pedicel ovary is 2 to 2.8 mm. Sepals are acute, with conduplicate and reflexed apices; dorsal sepal is 16 mm; lateral sepal is oblique and 2.2 mm. Petals with a short nail, acuminate, 16 mm. Lip is bilobed underneath the middle, 18 mm; lateral lobes with curved edges and rounded apices; intermediate lobe is aovate, 9 mm, with acute apex; disc with a pubescent callus that consists of a slightly elevated keel from the base to the middle of the lip, also with two longer keels surpassing the central keel and two small and divergent keels. Column is short, robust and 6 mm.

Habitat: Epiphyte in humid lands - low.

Flowering season: May.

Observations: We have not seen this species; information from Hamer (2001).

Oncidium ochmatochilum

(Reichembach) 1856

■ **Description:** Robust, with piriform pseudobulbs, up to 13 cm., plain and slightly compressed; when the pseudobulbs are young these are covered with imbricate sheaths having foliate limbs. Leaves are up to 65 cm., acute. Panicle inflorescence, up to 150 cm., each branch is floral laxi, with numerous small flowers with patent rigid segments; sepals and petals are green-yellowish, with brown-reddish patches; lip with white intermediate lobe, lateral lobes and isthmus are brown-orange, white edges, column with orange upper half and callus with orange patches; sepals are attenuated towards a short nail, acute with the apiculate apex; dorsal sepal is 16 mm. and lateral sepals are 15 mm, oblique, dorsally carinate; petals are 1 mm, concave, acute, with conduplicate apex; lateral lobes are small, 1.5 mm, patent, with round apices; middle lobe is spade like an anchor, 12 mm. Column is erect, 6 mm, with a pair of short protuberances at the base, fleshy, angular, with short wings on the apex, ovary is slightly arched, 2.5 cm., pedicel.

Habitat: Epiphyte at 600-900 m., also in coffee plantations.

Flowering season: February.

Observations: We have not seen this species; information from Hamer (2001).

Oncidium oliganthum

(Reichembach f.) L.O. Williams ex. Correll 1947

■ **Description:** Erect, up to 40 cm.; compressed pseudobulbs, with two to three leaves that are up to 5 cm. Leaves are ligulate, sub- coriaceous, up to 30 cm., with an obliquely retuse and obtuse apex, dorsally carinate, conduplicate base. Inflorescence from the base of the pseudobulb, up to 40 cm., including the 30 cm. peduncle, which has two to three tight sheaths, 15 mm; loosely paucifloral. Flowers are long, patent, and showy; sepals and petals are red brown, with yellow patches. Lip is intense yellow.

low, with a red brown isthmus, a red fringing red band around the edge of the intermediate lobe; wings of the column and lip of the callus have red patches; floral bract is rigid, acute, 10 mm. sepals are spatulate, with irregular edges, concave; dorsal sepal is 18 mm. with a wide nail; lateral sepals are oblique, 16 mm, with a short nail; all sepals are acute and apiculate. Petals with 16mm. concave wavy edges. Lip is sessile, panduriform, trilobed, 2 cm., dilated at the base and with auricular lobes; isthmus is 6 mm. wide; mid lobe is widely cuneiform, 10 m. m, inconspicuously retuse; disc with an oblong 7 mm. callus, with four truncate teeth on the apex, with two short lateral calli at the base. Column is 10 mm.

Habitat: Epiphyte in cloud forest.

Flowering season: August and November.

Observations: This species seems to be especially susceptible to bacteria, we have seen pseudobulbs of several plants rot shortly after transplant.

Oncidium ornithorhynchum

Kunth 1815

■ **Description:** With 5 cm. pseudobulbs, light green to blue-green, sheaths are dictic and with foliar limbs, bifoliate. Leaves are 21 cm., pale green, acuminate, conduplicate at the base, dorsally carinate. Lateral Inflorescence, paniculate, 40 cm., multi flowered; purple peduncle with 8 mm. sheaths. Flowers are red-violet. Sepals are 9 mm, red-violet, curved, unguiculate, with wavy edges, rounded at the apex. Petals are 9 mm, same color as sepals, obtuse. Lip is 1 mm, light red-violet, trilobed; lateral lobes are small and revolute; intermediate lobe is bilobed marginate on the apex; dark orange callus, consists of five fleshy, irregular, elevated crests and two horn-shaped tubers in front. Column is short, white, with two big auricles irregularly dentate on the apex and a long projection like a bird beak.

Habitat: Epiphyte in wet forest.

Flowering season: September to January.

Observations: We have seen this species in Costa Rican collections only.

Oncidium planilabre

Lindl. 1851

■ **Description:** Up to 22 cm. tall; pseudobulbs are bifoliate, up to 4 cm., compressed. Leaves are ligulate, sub-acute, with conduplicate base, up to 20 cm. Inflorescence shorter than the leaves, up to 18 cm., including the 9 cm. peduncle, with 3 to 4 tight and 10 mm. sheaths, with six flowers at 1.5 cm. intervals. Flowers are 2.8 cm., the mid lobe, sepal apices, petals and lip of the lateral lobes' apices are yellow, callus and the portion underneath the lip's mid lobe are red-brown, petals and sepals (excepting their apices) are red brown. Floral bract is 10 m. m, lanceolate, acute. Sepals with wavy edges and sub-acute apex, spatulate; dorsal sepal is 1.3 cm., including the 3 mm. nail; lateral sepals are 1.7 cm., including the 4 mm. nail. Petals are 1.3 cm.; nail has twice the sepal width. Lip is trilobed, 11 mm. over the lateral lobes and 8.5 mm. over the intermediate lobe; retuse

with a conspicuous apicule on the sinus; disc with a 2.5 mm. callus, sulcate in the center, with two dentate and superposed plates; apexes with three tuberos teeth. Column is 4 mm., wingless, but with three teeth projecting downwards above the stigma; at the base of the callus is an erect 2 mm. tuber.

Habitat: Epiphyte in tropical rain forest.

Flowering season: June.

Observations: We have not seen this species; information from Hamer (2001).

Oncidium sphacelatum

Lindely 1841

■ **Description:** Up to 1 m tall, with thick rhizome and attenuate pseudobulbs towards a bifoliate apex, plain, compressed, sometimes arched, up to 13 cm., covered with long scarious sheaths which have foliar limbs. Leaves are erect, patent, linear, acute, sub- coriaceous, up to 50 cm., with a channeled base. Inflorescence is up to 1.5 m, raceme or panicle, with short branches; peduncle from the base of a sheath, scarious sheaths to 15 mm; each branch has about six flowers; flowers are intense yellow with petals and sepals having red brown stripes and patches. Lip with a big red brown patch at the base of the intermediate lobe; callus with red patches; apices of sepals and petals are yellow. Floral bract is lanceolate, acuminate, scarious, 1 cm. Sepals with wavy edges and reflexed apices; dorsal sepals is acuminate, 13 mm; lateral sepals are 17 mm, lanceolate. Petals are horizontal, acute, elliptic, 13 mm. Lip is widely panduriform, trilobed on the isthmus; lateral lobes are shortly rounded; intermediate lobe is largely retuse, 1.5 cm.; disc with a callus composed of two divergent auricles at the base and 2 at the middle, with two elongated apical teeth, and an oblong thickening on top. Column is thin, with crenulate and divergent wings, and edges with red apical patches.

Habitat: Epiphytic and lithophilic; grows on dry lowlands.

Flowering season: April and May.

Observations: Locally common, adapts well to cultivation, reproducing rapidly.

Oncidium splendidum

Rich 1862

■ **Description:** Aggregate, green, unifoliate pseudobulbs, to 7 cm., compressed. Leaves are very fleshy, up to 50 cm., coriaceous, deeply sulcate, greenish to purple, acute. Lateral inflorescence, panicle, multiflowered, up to 1.2 m, light green peduncle, terete, with several scarious sheaths. Flowers are showy, yellow with red brown patches. Sepals are 15 mm, revolute on the apex, yellow with red brown patches; petals are 20 m. m, same color as the sepals. Lip is patent, panduriform, 3 cm., trilobed; lateral lobes are small, round, somewhat reflexed; intermediate lobe is yellow with red brown patches on each side between the lateral lobes, emarginated, bilobed; disc with a tricarinate callus, with white lateral carinae which are shorter than the central carinae, this is elongated and yellow with patches on the apex. Column is 10 mm., deeply sulcate,

with five concave wings, orbicular on the apex.

Habitat: Lithophilic; grows in hot and dry areas.

Flowering season: December to January.

Observations: Not common but adapts very well to cultivation, so it is more common in collections, than its reduced wild populations would suggest.

Oncidium stenotis

Reichembach f. 1877

■ **Description:** Big and robust to 3m. Pseudobulbs are unifoliate, laterally compressed, up to 11 cm. Leaves are up to 45 cm., carinate, with an obliquely retuse and sub-acute apex. Inflorescence up to 3 m, paniculate, with 2 cm. sheaths at the base of branches. Flowers with yellow dorsal sepal and petals; edges and apices having a red brown center; lateral sepals are pale brown, lip yellow with red brown isthmus. Floral bract is inflated, lanceolate, acuminate, 10 mm. Sepals and petals are wavy, acuminate and conduplicate apices, slightly falcate; dorsal sepals is lanceolate, dorsally carinate, 20 mm. lateral sepals are 25 mm, with a conduplicate nail. Petals without nail, 19 mm. Lip is trilobed, panduriform, conspicuously shorter than the lateral sepals, 15 mm, with patent lateral lobes; central portion is contracted on a short isthmus; intermediate lobe is dilated, emargined and bilobed; disc with a fleshy callus, with 7 to 9 tubercles teeth. Column is 6 mm, with two inconspicuous wings but with 2 lateral thickenings underneath the stigma.

Habitat: Epiphyte; grows in wet mountains and the wet Atlantic plains.

Flowering season: August and September.

Observations: The most common *Oncidium* in wet regions and forms very big plants.

Ornithocephalus bicornis

Lindley 1843

■ **Description:** 10 cm. tall. Leaves are rigid, obliquely lanceolate, acute, up to 10 cm. Inflorescence in raceme, from the axils of the leaf sheaths, multiflowered, wooly, as long as the leaves. Flowers are small, semi-patent, sepals and petals are green, underside and nail are greenish, the rest is white. Floral bracts are dorsally carinate, ciliated, 5 mm. Sepals are dorsally carinate, with the carinae ending in an apicule, outside is hispid, 1.5 mm. Petals are sub-orbicular, erose, only the upper side is hispid, 1 mm, acute. Lip is trilobed at the base, channeled, curved, 4 mm. Lateral lobes are fleshy small. Column is robust at the base and ends on a thin curved 2 mm peak.

Habitat: Epiphyte; grows on trunks in wet forest shade.

Flowering season: December to January.

Observations: Difficult to grow in cultivation, leaves have to hang downward. Locally common, distinctive from other species of the genus because of its smaller flowers. The leaf and growing pattern is similar to *Heterotaxis valenzuelana*, but plants are much smaller.

Ornithocephalus gladiatus

Hook. 1824

■ **Description:** Up to 12 cm. Leaves are sessile, fleshy, up to 9 cm., generally shorter. Sheaths of the leaves are imbricate, conduplicate, with hyaline edges, 7 mm. Racemose inflorescence, from the axils of the sheaths, laxly multifloral; peduncle and rachis with irregularly serrate and pilose wings, 6 cm. Flowers with white petals, green-white sepals, dark green nerves, greenish lip and olive green callus. Floral bracts with pilose-ciliate and curved edges, dorsally carinate, 3 to 7 mm. Sepals are patent to reflexed, deeply concave, with pilose-serrate apical edges; dorsal sepal is carinae and apiculate, 5 mm. besides the 1 mm. apicule; lateral sepals with a short nail, oblique, 3 mm. besides the 1 mm. nail. Lip is 3.5 mm. wide near the callus, contracted at 1 mm. above the callus and 1.5 mm. near the middle; the apical third is sub-acuminate; the total length of the lip is 7.5 mm; disc two fleshy, erect and 3 mm. lobes. Column is 2.5 mm, with an apiculate 6.5 mm. rostellum.

Habitat: Epiphyte; grows on wet mountains in closed forest under shadow, at 1000 m. & .

Flowering season: December to June.

Observations: found at higher elevation than *O. bicornis*, with the same growth pattern; leaves always face downwards.

Osmoglossum anceps

Schlechter 1923

■ **Description:** Erect, up to 30 cm. tall. Pseudobulbs are compressed, relatively plain, shiny green, bifoliate, up to 5 cm. Leaves are sub- coriaceous, linear, channeled, acuminate, up to 25 cm. Inflorescence is shorter than the leaves, 2 to 4 flowers, with a compressed peduncle which is up to 15 cm. Floral bract is acute, up to 6 mm. Dorsal sepal with five nerves, acute, 7 mm; lateral sepals are adnate forming a bifid, short and aovate lamina which has eight nerves and is 8 mm. Petals are widely aovate, acute, 8 mm, with seven nerves. Lip is slightly contracted in the center, with slightly wavy and crenulate edges; truncate apex, slightly retuse, with an apicule on the sinus; lamina is extended 9 mm, sessile. Disc with a sub-orbicular callus that is 4 mm, with apically curved lateral carinae, ending in two teeth, from the base of these teeth two carinae underneath which are united near the base of the lip where they form an erect tooth. Column is short, trilobed, with lacerated lobes.

Habitat: Epiphyte; on wet mountains.

Flowering season: January.

Observations: We have not seen this species; information from Hamer (2001).

Pachystele minuta

(Rich & Gal) 1845

■ **Description:** Cespitose, branched, up to 40 cm. tall. Stems are cylindrical, thickened as pseudobulbs, bifoliate on the apex, up to 10 cm., covered with scarious sheaths at the base which are up to 4 cm. Leaves are linear, obliquely bilobed on the obtuse apex, membranous, up to 9 cm., dorsally carinate. Inflorescence is unifloral on the apex of the pseudobulbs. Flow-

ers with white-greenish petals and sepals, with slight brown patches; white lip with a red center; column with brown edges. Floral bract is imbricate, partially hiding the ovary. Sepals are acute, 4 mm. Petals are 4 mm. Lip is arched with an apicule on the sinus, with dentate edges, 4 mm; disc with a verrucose callus, slightly elevated from underneath to above the middle. Column is short, 3.2 mm, with a widely orbicular and concave foot, 1.5 mm, and wide wings on the edges.

Habitat: Epiphyte in wet forest.

Flowering season: February, March.

Observations: We have not seen this species; information from Hamer (2001).

Palmorchis silvicola

L.O. Willams 1970

■ **Description:** Cespitose, 30 cm. tall, with fibrous roots. Stems are 10 cm., having 3 to 4 leaves near the apex. Leaves are thin, acute, petiole is 6 to 10 cm., lamina is 15 cm. Raceme Inflorescence, 3 cm., paucifloral, with 5 to 6 mm. Floral bracts, acuminate. Flowers are white with few red patches on the interior edges. Dorsal sepal is 7 mm, obtuse, dorsally carinate and somewhat verrucose on the exterior apical portion; lateral sepals are 5 to 6 mm, falcate, dorsally carinate. Lip is 5 mm, apex is conduplicate in natural position and very fleshy; adnate to the column for approximately 3 mm. Column is arched, 6 mm, surpassing the lip.

Habitat: Terrestrial on wet plains.

Flowering season: April and May.

Observations: We have found it only once, it is more common downstream on the San Juan River in old growth forests. As its name implies, it is similar to palm seedlings which are abundant in the same forests.

Pelexia congesta

Ames & Schweinfurth 1930

■ **Description:** Thin, 20 cm. tall, with fleshy roots. Stem is short, 10 cm., covered with striated sheaths, acuminate, 3 cm. Leaves are acute, with three main nerves, up to 20 cm., including the winged 4 cm. petiole. Inflorescence is multifloral, 10 cm. Flowers are greenish, dorsal sepal and posterior middle of the sepals are green, lateral sepals are white-greenish, intermediate lobe of the lip is yellow. Floral bract is acuminate, 3 cm.; dorsal sepal is spatulate, 2 cm., sub-acute, with a 2 mm. wide nail; lateral sepals are acute, patent and arched, the free portion is 1.5 cm., the nail is 1 cm. Petals are obliquely spatulate, 20 mm, obtuse. Lips is 34 mm, gradually attenuated up to the middle, contracted near the apex, forming a widely ovate 4 mm. apical lobe, with tridentate apex, two auricles at the base measuring 5 mm; disc is channeled and ciliated between the papillose auricles and the middle of the lip. Column is thin, slightly arched, 2.2 cm.

Habitat: Epiphyte in tropical wet areas.

Flowering season: February to April.

Observations: We have not seen this species; information from Hamer (2001).

Pelexia funckiana

(A. Rich & Gal.) Schlechter 1918

■ **Description:** Thick fleshy roots, with basal leaves. Leaves are present during the flowering season, dark green, with channeled petiole, sometimes purple, 5 to 12 cm. Floral scape is 30 to 40 cm., glabrous underneath and with white hairs on top, with 6 cm. sheaths underneath to 2 cm. above. Flowers are dark green, 25 mm, with white hairs and a green bract. Sepal is 18 mm; dorsal sepal is 5 mm. wide; lateral sepals are 3.5 mm. wide. Petals are coherent to the dorsal sepal, 17 mm, translucent and glabrous. Lip is 20 m. m; basal portion is green, in the middle is yellow and the apical lobe is white, dilated and strongly curved; at the base are 2 thick conspicuous calli. Column is 10 m. m, light green.

Habitat: Terrestrial; in cloud forest.

Flowering season: April.

Observations: We have not seen this species; information from Hamer (2001).

Pelexia laxa

(Poepp & Endl.) Lindl. 1840

■ **Description:** Robust, up to 80 cm. tall, with fleshy fasciculate roots. Leaves are basal, two to three, largely petiolate, green with yellow-greenish on top, up to 20 cm., with a thin petioles up to 15 cm. Floral scape is erect, multi flowered, pale purple, covered with several sheaths. Bracts are acuminate, pubescent. Flowers are showy, green to pale green with red. Dorsal sepal is lanceolate, acute, 12 mm; lateral sepals are acuminate, united at the bases and forming a chin with the base of the column. Petals are coherent with the dorsal sepal, 12 mm. Lip is 20 m. m, with 2 fleshy calli, divergent at the base; lamina is conduplicate, trilobed at the apex with the reflexed intermediate lobe, obtuse, rhomboidal. Column is thin with a conspicuously linear rostellum up to 2 mm.

Habitat: Terrestrial; in wet areas.

Flowering season: unknown.

Observations: We have not seen this species; information from Hamer (2001).

Pelexia smithii

(Reichembach f.) Garay 1982

■ **Description:** Up to 30 cm. tall, with fasciculate roots, fleshy, with black hairs. Leaves, approximately 6, basal, 30 cm., with a winged 9 cm. petiole, wavy edges, acute, pale green with white patches. Racemose inflorescence with 8 flowers, unilateral; stem is 22 cm., covered with gray-greenish 6 cm. sheaths. Flowers are big, intense yellow, with green dorsal sepal. Floral bract is lanceolate, white-gray, 3 cm. Sepals are pubescent towards the base; dorsal sepal with obtuse slightly reflexed apex, 2.3 cm., with curved edges in the middle, with an intermediate and a lateral nerve near each edge; lateral sepals are falcate, united,

forming a conspicuous chin with the base of the column, the free portion is 2.1 cm. Petals are falcate, with a triangular apex, 1.9 cm. Lip is arched, spatulate, with a sacciform base, 3.2 cm. underneath the apex; disc with lateral teeth, basal, retrorse, 3 mm, pubescent between the teeth and the center of the disc. Column is 2.5 mm, including the elongated rostellum, pubescent on the basal portion.

Habitat: Terrestrial, tropical wetlands.

Flowering season: February.

Observations: We have not seen this species; information from Hamer (2001).

Phragmepedium existaminodium

warscewiczianum

Dressler 2005

■ **Description:** Erect, robust, 40 to 50 cm. tall, with a finely papillose floral scape, with 2 to 4 showy flowers. Leaves are basal, 10 to 25 cm., dictic, dorsally sulcate, coriaceous. Floral bract is big, conduplicate and inflated. Flowers have variable colors, generally yellow-greenish with brown or purple patches. Sepals are pubescent on the outside, with wavy edges; lateral sepals are united to form a lanceolate and acuminate lamina on the apex, 8 to 13 cm. Petals are extended on extremely large pendant, cauda up to 60 cm. Lip has a shoe shape, inflated, open, with curved edges, 4 to 5 cm., generally greenish with red or brown patches.

Habitat: Epiphyte or lithophilic; in wet areas.

Flowering season: July.

Observations: We have not seen Nicaraguan specimens and could neither confirm nor discard if it is a synonym of the Costa Rican form.

Physoiphon spiralis

Lindley 1797

■ **Description:** Cespitose, up to 25 cm. tall. Secondary stem is 8 cm., covered with 2 to 3 sheaths. Leaves are 9 cm., attenuated towards the base, short petiole. Inflorescence is 15 cm., longer than the leaf, densely multifloral almost to the base. Floral bract is 2 mm. Sepals are connate on the base, 2 to 2.5 mm, whitish yellowish. Petals are 0.7 mm, translucent, obtuse. Lip is 0.8 mm, with 3 longitudinal nerves. Lateral lobes are curved and very thin; intermediate lobe is truncate; disc on the basal portion with a transverse elevated callus. Column is 0.6 mm, with dentate wings at the apex.

Habitat: Epiphyte; on wet mountains.

Flowering season: June and November, but probably all year.

Observations: We have not seen this species; information from Hamer (2001).

Physoiphon tubatus

(Lodd.) Rchb. f 1861

■ **Description:** Cespitose, 20 cm. tall. Secondary stems are 6 to 8 cm., rigid, covered with scarious sheaths. Leaves are 10

cm., coriaceous, with a sulcate 2 cm. petiole, retuse apex with an apicule on the sinus. Inflorescence is a 12 to 15 cm., raceme, with 20 white-greenish flowers, with orange sepals and patent lobes. Floral bract is 4 mm, brown. Sepals forming an 8 mm. tube, wider at the base than on the apex; lobes are free, triangular, acute, patent, apiculate, dorsally carinate, 5 mm. Petals are 2 mm, dorsally carinate. Lip is 2.5 mm, with three dorsal nerves; intermediate lobe with erose edges. Column is 3 mm, with tridentate apex and a conspicuous foot.

Habitat: Epiphyte in cloud forest.

Flowering season: January.

Observations: We have seen this species only once at Miraflores.

Platystele compacta

(Ames) Ames 1922

■ **Description:** Cespitose, up to 3.5 cm. tall. Secondary stem is less than 5 mm, covered with scarious sheaths, white. Leaves are 2.5 cm., attenuate towards the base, short conduplicate petiole. Inflorescence up to 3.5 cm. tall, longer than the leaf, raceme, with filiform peduncle which is 2.8 cm. and with 6 to 8 patent and green-yellowish flowers. Sepals are 1.8 mm, subacute. Petals are 1.5 mm, rounded, obtuse on the apex, dorsally carinate. Lip is fleshy, 1.5 mm. Column is erect, without a foot, with 3 rounded apical lobes.

Habitat: Epiphyte; grows in wet areas.

Flowering season: November to February.

Observations: We found this species locally common at 700 and 900 m., on thick trunks in semi-open forest.

Platystele lancilabris

(Reichembach f.) Schlechter 1923

■ **Description:** Erect, cespitose, up to 2 cm. tall. Secondary stems are almost obsolete, approximately 1 mm, unifoliate, covered with scarious white sheaths. Filiform inflorescence racemose 1.5 to 2 cm., with successive flowers, same length as the leaves. Flowers are very small, patent, sepals and petals are yellow, lip is yellow-orange. Sepals are concave at the base, 2.2 mm; dorsal sepal is acuminate, 0.9 mm. wide near the base; lateral sepals are shortly acuminate, 1 mm. wide. Petals are uninnerved, 1.9 mm, shortly acuminate. Lip is fleshy, verrucose on the upper side, acuminate, 1.1 mm. Column is 1 mm, without a foot, winged near the apex.

Habitat: Epiphyte in cloud forest.

Flowering season: May to July.

Observations: We have not seen this species; information from Hamer (2001).

Platystele stenostachya

(Reichembach f.) Schweinfurth 1962

■ **Description:** Cespitose, 5 cm. tall. Secondary stem is unifoliate, with two sheaths. Leaves are green, 2 cm. Lateral inflorescence off the leaf base, shorter than the leaf. Flowers are suc-

cessive with light green pedicel ovaries and a translucent bract. Sepals are orange; lateral sepals are united up to the middle, 1.4 mm; dorsal sepal is concave. Petals also orange, 1.2 mm; lip is fleshy, verrucose to glandular, especially on the edges, orange. Column is short, wide, with two yellow pollinia.

Habitat: Epiphyte; in rain forest.

Flowering season: June, but probably all year.

Observations: Like all the *Platystele*, they are inconspicuous, often hidden among the roots of larger species like *Oncidium* or *Maxillaria*.

Platythelys vaginata

(Hook.) Garay 1977

■ **Description:** Stems creeping on the basal portions and then erect, 15 cm. tall, with several leaves. Leaves are dark green, acute, 5 cm., with a 2 cm. petiole, dilated at the base, surrounding the stem. Terminal inflorescence, multifloral raceme is 3 cm. Flowers are white with green, bracts with the same color, 8 mm. and 7mm. pediceled ovary. Sepals are 5 mm, translucent white and green on the basal portion. Petals are 4.5 mm, translucent. Lip is 4.5 mm, not including the spur; basal portion is fleshy, thick, partially surrounding the column and contracted in the center; apical portion is slightly trilobed with orbicular lateral lobes and triangular, acute and reflexed intermediate lobe; spur is sacciform, 3.5 mm, retuse at the apex.

Habitat: Terrestrial; grows in wet areas.

Flowering season: June to September.

Observations: See other *Platythelys*, we think they are synonyms even though we have seen among the abundance of plants some that can be attributed to one or the other descriptions.

Platythelys venustula

(Ames) Garay 1977

■ **Description:** Up to 7 cm. tall. Stem with several leaves. Leaves are pale green, the biggest leaf is 2 cm., with a long and thin petiole which is 1.5 cm. and dilated at the base, surrounding the stem. Terminal Inflorescence, paucifloral raceme, 15 to 20 cm. Floral bracts are foliose, lanceolate, acute, larger than the pedicel ovary, 7 mm. Flowers are white with a 2 mm. spur. Sepals are 2.5 mm; petals are 1.4 mm, asymmetrical. Lip is 2 mm, with a 2 mm. spur, apical portion is dilated, acute at the apex.

Habitat: Epiphyte; on branches of big trees and at 800-1300 m.

Flowering season: November.

Observations: This is another case where we have doubts, epiphytic specimens did not strike us as distinct *Platythelys* species on Mt. Mombacho.

Pleurothallis angustifolia

Lindl. 1835

■ **Description:** Creeping, with ascendant secondary stems, unifoliate, up to 2 cm. leaves are thick, reddish, with somewhat

curved edges, 2.5 cm., with acute and tridentate apex. Flowers are greenish with red stripes, dark red lip. Floral bract is acute, 2 mm. Dorsal sepal is trinnerved, concave, with involute edges, 5 mm; lateral sepals are joined almost up to the apex, concave, 4.5 mm. Petals are 1.5 mm, with the backside apically serrate. Lip is oblong, obtuse, with two erect lobes near the base, 2.5 mm.

Habitat: Epiphyte in cloud forest.

Flowering season: January.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis barbulata

Lindl. 1859

■ **Description:** Cespitose, up to 2 cm. tall. Secondary stems are less than 1 mm. Leaves are tridentate at the apex, attenuated towards the sulcate petiole, 1 to 2 cm., including the 2 to 4 mm. wide petiole. Racemose inflorescence, as long as the leaves; peduncle is filiform, 1.5 cm., covered with sheaths at the base. Flowers are successive, three to four; sepals are yellow with reddish nerves, petals and column are yellow, foot of the column is red, lip is dark red. Floral bract is 1 mm, ovary is 2 mm, persistent. Sepals are dorsally carinate, with a conspicuous nerve; dorsal sepal is concave, 4 mm; lateral sepals are connate forming a bifid apex, acute; lamina is 3.8 mm. Petals are acuminate, 2 mm. Lip is fleshy, very mobile, with deeply sulcate edges, with two nailed auricles at the base, with cilia lining the inside of the edges of the inside outer half; apex is obtuse, 2.5 mm; disc with an elliptic depression on the lower third and two small projections near the nail. Column is 2 mm, nailed, with two wide thin wings, and two teeth at the apex.

Habitat: Epiphyte; grows on wet mountains.

Flowering season: June to August.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis cardiothallis

Reichembach 1867

■ **Description:** Erect, rigid, 20 to 40 cm. tall. Secondary stems are rigid, 18 to 30 cm., covered with two tight sheaths. Leaves are cordiform at the base, 15 to 16 cm., coriaceous. Fasciculate inflorescence from a conduplicate spathe, 1 to 1.5 cm. Flowers are yellow and green-yellowish, green to orange lip. Sepals are concave, finely pubescent outside; dorsal sepal with five nerves, 1.5 cm.; lateral sepals are united, 1.5 cm., with 6 main nerves. Petals are acuminate with curved apex, 1.1 cm. Auricle lip at the base. With a short fleshy nail, inside and edges are finely ciliated, 7.5 mm; disc with a concave excavation, triangular at the base. Column is short, 3 mm, with a 1.5 mm. foot.

Habitat: Epiphyte in cloud forest.

Flowering season: May to September.

Observations: There is a rare dark red flower type found amid the more common yellow flowered populations.

Pleurothallis chontalensis

A.H. Heller & A.D. Hawkes 1966

■ **Description:** Up to 6 cm. tall. Secondary stems are 5 to 7 mm, covered with scarious sheaths, white. Leaves are 3 to 4.5 cm., including the 5 to 10 mm. petiole. Solitary inflorescence, with filiform 4 cm. peduncle, glandulous, generally with one flower. Flowers are 1.5 cm., ocreaceous or green-yellowish, petals and lip stet are orange. Sepals are acute, 10 m. m, with glandular surface and ciliate edges; dorsal sepal is 3 mm. wide with interior surface covered with rounded conspicuous patches; lateral sepals are connate, 4 mm. wide. Petals are thin, spatulate, with a wide lobe on the anterior edge, acute apex, with two nerves, 3 mm. Lip is parallel to the column, 3.5 mm, fleshy, verrucose, with an erect lobe on each side near the base; callus is bifid, elevated, papillose. Column is thin, 2.5 mm, tridentate at the apex, with a 1.3 mm. foot with a 90° angle to the column.

Habitat: Epiphyte; grows in rain forest.

Flowering season: August to December.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis corniculata

(Sw.) Lindl. 1842

■ **Description:** Up to 6 cm. tall. Secondary stem is short, 4 to 5 mm., covered with three brown scarious sheaths. Leaves are 2.5 cm., with a sulcate petiole. Peduncle is solitary, generally unifloral, 4.5 cm. Flowers generally are clietogamous, with green-yellowish petals and sepals, darker nerves, lip and column are orange, anther and pollinia are white. Floral bract is acute, brown, 2.5 mm., apex is somewhat compressed. Lip is arched, with curved basal edges, small and erect auricles on each side, 2.5 mm., finely papillose at the apex and lateral auricles. Column is winged, 2 mm., with a 0.75 mm. Foot.

Habitat: Epiphyte; in tropical rain forest.

Flowering season: Several times a year, but mostly on June and August.

Observations: we have not seen this species; information from Hamer (2001).

Pleurothallis dolichopus

Schlechter 1922

■ **Description:** Secondary stems are up to 20 cm., green and covered with brown sheaths. Leaf with a short petiole, obtuse to round. Terminal Inflorescence, up to six Inflorescences on the same stem; raceme with 10 to 15 flowers. Flowers are white-yellowish. Sepals are thin, outside is glabrous, inside is shortly pubescent; sepals are 12.5 mm; lateral sepals are connate to their bases. Petals are 4 mm., round, translucent with a carinate central nerve, wide and purple. Lip is arched, 4 mm., with two elevated purple carinae on the sides that are united approximately at the apex, with a less conspicuous carina at the center, green background with purple carinae and midlobe edpes. Column is 3 mm., with a foot, yellow with purple stripes.

Habitat: Epiphyte; grows in cloud forest.

Flowering season: May, October and November.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis endotrachys

Reichemabach 1876

■ **Description:** up to 20 cm. tall. Secondary stems are small, covered with inflated sheaths. Leaves are 10 cm., including the 2 cm. petiole. Inflorescence at the base of the leaf, longer than the leaves, with a winged peduncle and reflexed rachis. Flowers are successive, with a very inflated bract, brown to orange or purple-orange. Dorsal sepal is 15 mm; lateral sepals are 14 mm. and connate in the basal third; the interior of the sepals is conspicuously verrucose and orange, the exterior is glabrous, greenish and very carinate. Petals are 8 mm., linea. Articulate lip with the foot of the column, curved, 5 mm., glabrous, complete, with two carinae on the sides, truncate, red-orange. Column is winged and dentate at the apex, with a big foot.

Habitat: Epiphyte; grows on coffee plantations and evergreen forests.

Flowering season: Sometimes throughout the year.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis erinacea

Reichembachf 1855

■ **Description:** Up to 30 cm. tall. Secondary stem is erect, fleshy, 3 cm., unifoliate. Leaves are obtuse, 12 cm. Solitary Inflorescence, racemose, longer than the leaf, up to 20 cm., including the 17 cm. peduncle, with fractiflex rachis. Flowers are golden ochre, with an ochre-brown lip. Floral bract is acuminate, 1.3 cm. Sepals with five nerves, fleshy apex, 1.2 cm.; dorsal sepal is concave, 4.6 mm. wide; lateral sepals are 4 mm. wide, carinae. Petals are thin, acute, have two papillose auricles at the base. Lip is obtuse, fleshy, 9 mm., including the nail; disc is finely papillose, sulcate over the middle. Column is 6 mm., with a 3 mm. foot and, tridentate apex.

Habitat: Epiphyte; on very dry pre-mountain forest.

Flowering season: January and February.

Observations: Species relatively big and fleshy resists to prolonged dehydration.

Pleurothallis fuegii

Reichembach f. 1866

■ **Description:** Up to 6 cm. tall. Secondary stems is 3 mm., covered with whitish sheaths. Inflorescence is 6 cm., including the filiform peduncle with up to 4 successive flowers. Leaves are 2 cm., including the short 8 mm. peduncle, with retuse apex and a small apicule on the sinus, coriaceous, dorsally carinate. Flowers are cream-yellowish. Floral bract is acuminate, less than 1 mm. Dorsal sepal is 6 to 7 mm. including the 3 mm. cauda, dorsally carinate, concave. Lateral sepals are 6 to

7 mm. Petals are spatulate, with obtuse apex, 2 mm. Lip is somewhat trilobed, arched in natural position, 1.5 to 2.5 mm; intermediate lobe is obtuse, convex; lateral lobes are erect in natural position. Column is 1.2 mm., arched, with a trilobed apex and a conspicuous foot.

Habitat: Epiphyte in forest.

Flowering season: July.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis fuegii. var. echinata

L.O. Williams. 1946

■ **Description:** Up to 4 cm. tall. Secondary stem is very short, no more than 2 mm. Leaves are coriaceous, 3 cm., gradually attenuate towards the long petiole, 1.5 cm., with conspicuous apex and apicule on the sinus. Filiform inflorescence, 5 cm., with approximately five successive flowers. Flowers are white; the sepal apices are cream. Floral bract is tubular, apiculate, 1 mm. Sepals are dorsally carinate; dorsal sepal is 8 mm., trinerved, with a 3 mm. cauda; lateral sepals are 7 mm., adnate to the foot of the column, forming a chin, with fleshy linear cauda. Petals with obtuse apex, 2 mm. Lip is 3 mm., apical portion is fleshy, round and convex, the base is auriculate. Column is short, nailed, 1.5 mm. long, with a 1.5 mm. foot at a 90° angle with the column.

Habitat: Epiphyte in cloud forest.

Flowering season: September.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis helleri

Hawkes 1966

■ **Description:** Up to 50 cm. tall, with short rhizomes. Secondary stems are up to 35 cm., with one striated and 1.5 cm. sheath at the base and another 4 cm. sheath at the middle which is 4 cm. Leaves are 20 cm., attenuate towards the conduplicate petiole. Several inflorescences, racemose, up to 10 cm., including the peduncle that grows from a carinate spathe, short, 4 mm., 10 to 20 flowers. Flowers are patent, green-yellowish, with red patches on the lateral lobes of the lip and the callus. Floral bract is 1.5 mm. long. Sepals are acuminate, dorsally carinate; dorsal sepal is 10 mm; lateral sepals are connate towards the truncate apex, with four nerves. Petals are 9 mm., patent. Lip is fleshy, verrucose, somewhat arched; lateral lobes are thin, round and erect; midlobe is fleshy, verrucose, obtuse; disc with an elevated callus along the base of each lateral lobe. Column is short, nailed, 1.5 mm., finely papillose, with a conspicuously rounded foot.

Habitat: Epiphyte in rain forest.

Flowering season: January to December.

Observations: Very similar to *Stelis gelida* but with more elongate flowers. This species also likely belongs in *Stelis*.

Pleurothallis lewisae

Ames 1931

■ **Description:** With unifoliate secondary stems, 2 mm., covered with scarious sheaths. Leaves are 6 to 18 mm. Peduncle is solitary, unifloral, 3 to 7 mm., with hispid sheaths at the base. Flowers are patent, red-brown; sepals; bases are yellow. Floral bract is inflated, 2 mm. Dorsal sepal is 5 to 6 mm.; lateral sepals are connate near the base, 5 to 6 mm. Petals are 3 to 4.3 mm., ligulate, with obtuse apex. Lip is oblong, with rounded apex and a triangular lobe on each side; disc is verrucose between the base and the lateral lobes, with a verrucose callus from the base to the apex. Column is arched and nailed, 2 mm., with a short foot and a winged apex.

Habitat: Creeping Epiphyte; grows on the bark of trunks clinging very well to it, in lowland rain forest.

Flowering season: September to December.

Observations: This species is found along the San Juan River in relatively undisturbed rainforest.

Pleurothallis luctuosa

Reichembach f. 1876

■ **Description:** Up to 20 cm. tall. Secondary stem is 4 to 8 cm., lower half is covered with tight brown carinate sheaths. Leaves are dark green, 6 to 12 cm., attenuate towards the base, dorsally carinate, with revolute edges. The plant has one to two inflorescences, racemose, with one to three flowers, never taller than half the leaf, with a filiform peduncle from the base of a brown 5 cm. spathe. Flowers are 2 cm., very variable in color, from dark red to green-yellowish with red stripes. Floral bract is 2 mm. Sepals are 1.3 cm.; dorsal sepal is concave, the upper half is caudate; lateral sepals are connate, with four nerves, two of them are dorsally carinate. Petals are fleshy, outside is verrucose, 8 mm. Lip is triangular, acute, with a fleshy nail, trilobed over the nail, with curved lobes, 2 mm; disc with a sulcate warty callus on the nail; the entire disc is verrucose. Column is 1.5 mm., without a conspicuous foot and with a trilobed apex.

Habitat: Epiphyte in cloud forest.

Flowering season: May to October.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis matudiana

C. Schweinfurth 1938

■ **Description:** Up to 15 cm. tall. Secondary stem is rigid, covered with two tight sheaths, one at the base and another near the middle. Horizontal leaves are acuminate, shortly cordiform at the base, 6 cm. Inflorescence is generally unifloral but it can have up to four flowers, from a spathe on the leaf base. Flowers are ochre-yellow, sepals and petals have red-brown stripes, lip is reddish except for the base and the lateral lobes. Sepals are concave, with all nerves dorsally carinate; dorsal sepal is 7.2 mm; lateral sepal with four nerves, completely connate, 8 mm., with a small depression near the base. Petals are almost parallel

to the lip, with auricles at the base, edges are finely erose, fleshy base, 7.2 mm. long. Lip with a short and fleshy nail, apex with an obtuse apicule, 4 to 8 mm; disc is sulcate on the lower half and rugose. Column is 2 mm., with a short foot.

Habitat: Epiphyte in pine and oak forest, and in cloud forest from 1000 to 1500 m.

Flowering season: September to January.

Observations: flower color is variable between reddish pink and purple.

Pleurothallis nemorum

Schlechter 1923

■ **Description:** 10 to 20 cm. tall. Secondary stems are thin, with two brown sheaths. Leaves are green, coriaceous, generally horizontal, cordiform at the base, acute, tridentate at the apex, 5 to 8 cm. wide. Inflorescence off the leaf base. Flowers are successive, yellow-brown, translucent, with reddish nerves, growing from a 1 cm. spathe. Dorsal sepal is 6 mm., with five nerves; lateral sepals are 6 mm., with six nerves. Petals are uninerved, acute, 5 mm. Lip is orange, 3.5 mm., acute, but not apiculate at the apex, with a circular hollow at the base. Column is short and thick.

Habitat: Epiphyte in cloud forest.

Flowering season: October to January.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis obovata

Lindl. 1842

■ **Description:** Erect, ascendant, up to 9 cm. tall. Secondary stems are rigid, 4 cm. and conspicuously spaced. Leaves 5 cm., fleshy, coriaceous, with a round, curved apex, including the 6 mm. petiole. Inflorescence is a very short, raceme, 1 cm. long, with three flowers simultaneously, with several bracts at the base. Flowers are pale yellow, with an orange foot on the column. Floral bract is arched, 1 mm. Sepals are 5 mm., trinerved; lateral sepals are connate up to the middle. Petals are acuminate, 4.5 mm., with curved edges; disc with thin lamina on each side of the sulcate portion. Column is 2 to 3 mm. long, with a 0.5 to 1 mm. stet, arched.

Habitat: Epiphyte on sloping hills.

Flowering season: December.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis phyllocardioides

Schlechter 1923

■ **Description:** Erect and ascendant, up to 10 cm. tall. Stem is rigid, thin, 9.5 cm., covered with two 1.5 cm/ sheaths. Leaf is horizontal at a 90° angle with the stem, 4.5 cm. Inflorescence is generally unifloral, with a 5 mm. carinate spathe. Flowers are patent, green-yellowish, with a yellow-orange anther. Sepals are concave, abruptly contracted towards the apex; dorsal sepal is

4 mm; lateral sepals are completely connate, 4 mm. Petals are patent, 2 mm. Lip with a round apex and slightly erose edges, 1.75 mm., with a fleshy nail, at a 90° angle with the lamina, base is cordiform; disc is finely verrucose and with an orbicular depression near the base. Column is short, 0.8 mm., with a very short foot.

Habitat: Epiphyte in wet forest.

Flowering season: October to December.

Observations: We have found this species only in Boaco at 900 m.

Pleurothallis platystylis

Schlechter 1912

■ **Description:** Up to 35 cm. tall. Secondary stem is terete, to 18 cm., covered with a 12 cm. apical sheath. Inflorescence with one or two multifloral racemes, with green-yellowish flowers, all facing to the same side. Floral bract is brown, tight, 3 mm. Sepals are finely pubescent on the inside; dorsal sepal is 6.5 mm; lateral sepals are 7 mm. falcate. Petals with a red nerve, round apex, 4 mm. Lip is trilobed near the apex; lateral lobes are rounded, erect; intermediate lobe is small, verrucose and with erose edges, 3.5 mm. Column is nailed, 3 mm., with a wide foot in a 90° angle with the column.

Habitat: Epiphyte in cloud forest.

Flowering season: December and January.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis pruinosa

Lindl. 1842

■ **Description:** Up to 8 cm. tall. Secondary stem is very thin, lower half is covered with two tight sheaths. Leaf is thick, with a conspicuously sulcate central nerve, 3 cm. It has one to two Inflorescences, with one to three flowers on each, with a fili-form 2 cm. peduncle from the spathe of the leaf base. Flowers are green-whitish; lip is green yellowish. Floral bract is triangular, somewhat inflated, 2 mm. Sepals are concave; dorsal sepal is trinerved, 4.5 mm; lateral sepals are connate with the bifid apex, with two nerves, 4 mm. Petals are 4.5 mm. Lip is fleshy, 2.3 mm., with a fleshy disc, excavated near the base of a short nail and sulcate from the nail to the middle. column is 1.5 mm., with papillose lower half and an inconspicuous foot.

Habitat: Epiphyte in wet areas.

Flowering season: Several times a year, without precision.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis pubescens

Lindl. 1836

■ **Description:** Generally pendant, with creeping rhizome. Secondary stems up to 12 cm. Leaf is fleshy, attenuate towards the base, 12 cm. Racemose inflorescence, up to 6 cm., including the peduncle, with up to 15 dictic flowers, all flowering

at the same time. Flowers are cream with red or red-brown patches, lip is intense red. Floral bract is 2 mm., pedicel ovary is 2 mm. and papillose. Dorsal sepal is 6.8 mm., concave on the basal portion, convex towards the apex; lateral sepals are partially connate, 6 mm. Petals are spatulate, extending as a triangular lobe towards the apex, serrate. Lip is fleshy, elliptic, with two lateral teeth at the base, round apex, obtuse, 2.5 mm; disc with a fleshy callus that is sulcate from the base up to near the apex; the entire disc is verrucose. Column is arched, nailed, winged, 1.8 mm., with a short foot forming a small chin with the lateral sepals.

Habitat: Epiphyte on branches in the canopy.

Flowering season: July to December.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis segregatifolia

Ames & Schweinfurth 1925

■ **Description:** Up to 6 cm. long. Secondary stem is 3 to 6 mm., covered with scarious sheaths. Leaf is purple on the underside, emarginated, tridentate at the apex, 3 cm., including the 6 mm. petiole. Inflorescence is longer than the leaf, racemose, 1.5 cm., with successive flowers and a filiform purple peduncle, 3 cm. to the first flower. Flowers are red with a white column. Petals are dorsally carinate, fleshy, obtuse apex; dorsal sepal is 4 mm; lateral sepals are 4 mm., connate over the middle with a conspicuous chin. Petals are linear, falcate, uninerved, 2.4 mm. Lip is arched, with orbicular, curved intermediate lobe, lateral lobes are erect and fleshy, 2.5 mm. Column is 2 mm., with a short foot and a winged apex.

Habitat: Epiphyte; in the cloud forest.

Flowering season: June, February, March.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis sertularioides

(Schwarz) 1826

■ **Description:** With creeping flexible rhizome. Secondary stems are ascendant, 2 to 5 mm., with scarious and fibrous sheaths on the basal portion. Leaves are 1 to 3 cm., tridentate at the apex. Terminal Inflorescence is 1.5 cm. long, including the filiform 1 cm. peduncle, which has one to two patent yellow flowers, apical parts are orange-yellow. Floral bract is tight, 1.3 to 2 mm. Sepals are acuminate, dorsally carinate; dorsal sepal is 4.5 mm; lateral sepals are 2.5 mm., oblique. Petals are acuminate, 2.1 mm. Lip is trilobed on the basal portion; lateral lobes as small teeth, at the base it has two auricles on the side of a short nailed; apex of the lip is fleshy, obtuse, the apical half is sulcate. Column is 2.5 mm., with a 1 mm. Foot and a serrate apex.

Habitat: Epiphyte in wet forest.

Flowering season: July and November.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallis testaeifolia

(Sw.) 1858

■ **Description:** Up to 30 cm. long, creeping, flexible rhizome and with one to two scarious sheaths at the base. Leaves are concave near the base, green and with a brown-black patches, 2.7 cm. Inflorescence with one to two flowers on the basal concavity of the leaf, with a 1.5 mm. peduncle that hides behind a carinate spathe that is 4 mm. Flowers are gray-green, with red nerves, outside is papillose, pink petals, dark red lip. Floral bract is 5 mm. Sepals are united on their apices when the flower opens, separating afterwards; fleshy, concave, 5 mm; lateral sepals are connate with the base. Petals are spatulate, with finely dentate apical edges, 2 mm. Lip with a short, quadrate and inconspicuously auriculate nail at the base, lamina is fleshy and verrucose, sulcate in the center; disc with a verrucose and round callus above the nail which is converted into a bifid callus, triangular, erect underneath the middle. Column is erect and 3 mm.

Habitat: Epiphyte, in wet forest.

Flowering season: January and February.

Observations: We have not seen this species; information from Hamer (2001).

Pleurothallopsis ujaensis

(Reichembach f.) Pridgeon & M.W. Chase 2001

■ **Description:** With short rhizome, up to 4 cm. tall. Secondary stem is up to 2 cm., unifoliate, with two brown reddish sheaths. Leaves are coriaceous, tridentate on the apex, acute, 20 mm. Inflorescence from the base of the leaf, unifloral, with a 1.5 mm. peduncle underneath a striped ovary. Sepals are concave, acute; dorsal sepal is 3.5 mm.; lateral sepals are falcate, 2.8 mm. Petals with crenulate apical edges, 2 mm. Lower half of the lip with sub-quadrate erect lateral lobes surrounding the column; intermediate lobe with truncate apex and erose edges, 1.8 mm.; disc with a triangular callus elevated from the base to the middle of the lateral lobes and two elevated calli at the base of the lateral lobes. Column is thin, 1.6 mm, with a 0.6 mm. Foot.

Habitat: Epiphyte in cloud forest, above 1000 m.

Flowering season: December, January.

Observations: Inconspicuous even with flowers; flowers are very small, white, cleistogamous, hidden at the base of the leaves.

Polystachya clavata

Lindley 1842

■ **Description:** Erect, without pseudobulbs. Stems or peduncles are covered with long scarious sheaths. Leaves are coriaceous, 11 cm., with obtuse apex. Racemose and multifloral Inflorescence, with short, erect 3 cm. branches. Flowers are yellow-greenish, with curved pedicel ovary and a floral bract, both are 3 mm. Sepals are trinerved, 2.5 mm.; lateral sepals are oblique and somewhat wider and larger than the dorsal sepal. Petals are 2 mm. Lip with a cuneate nail, trilobed near the mid-

dle; lateral lobes are obtuse; intermediate lobe is sub-quadrate, retuse at the apex, with somewhat crenulate edges; nail has a conical callus at the base. Column is short and fleshy, 1 mm., with an inconspicuous foot.

Habitat: Epiphyte in wet areas.

Flowering season: October to December.

Observations: We have not seen this species; information from Hamer (2001).

Polystachya concreta

(Jacq.) Garay & H.R. Sweet 1974

■ **Description:** Variable size, up to 40 cm. tall. Stem is foliote and thickened basally, forming an obovate 2 cm. pseudobulb. Leaves articulate on the sheaths, 14 cm. Terminal and multifloral inflorescence with an elongated panicle, compressed and covered with scarious sheaths. Flowers are fleshy, relatively small, yellow to greenish yellow. Dorsal sepal is obtuse, 4 mm; lateral sepals are acute and 5 mm. Petals are obtuse, 3 mm. Lip from a cuneiform base; intermediate lobe is quadrate to oblong, with a truncate and slightly emarginate apex; disc with a linear callus; the entire lip is 4 mm. Column is short, cylindrical, with an elongate 3 mm. Foot.

Habitat: Epiphyte in wet-tropical climate.

Flowering season: More than once a year, without a precise date.

Observations: We have not seen this species; information from Hamer (2001).

Polystachya foliosa

(Lindley) 1839

■ **Description:** Small pseudobulbs, 2 to 3 cm., covered with membranaceous sheaths, with three to four leaves. Leaves are dictic, 14 cm., green, conduplicate at the base, obtuse, obliquely emarginate. Inflorescence is up to 25 cm., peduncle is somewhat compressed. Flowers are small and inconspicuous, green-yellowish. Sepals are fleshy, green-yellowish with brown patches at the base; dorsal sepal is 3 mm.; lateral sepals are 3.5 mm. Petals are 2.5 mm., same color as the sepals. Lip is 3.5 mm., crenulate edges; intermediate lobe is curved, bigger than the lateral lobes, obtuse at the apex and somewhat apiculate; at the base of the disc is a round callus, conical, white-yellowish. Column is short, pale green.

Habitat: Epiphyte; grows in dry forest, even wet forest, isolated trees, fences, etc.

Flowering season: August.

Observations: Common species on the Atlantic slope withstands human intervention and adapts well to cultivation.

Polystachya lineata

Reichembach f. 1869

■ **Description:** Up to 30 cm. tall, with thin pseudobulbs, attenuate from a basal thickening, covered with sheaths. The plant generally has three leaves, the basal ones have foliar limbs,

with an obliquely retuse and conduplicate apex, up to 18 cm. Paniculate inflorescence, multifloral, with arched rachis; peduncle is slightly compressed, covered with tight sheaths, up to 5 cm. Flowers are semi-patent, sepals and petals are brown, with green nerves, the edges of the lip are brown, the rest of the flower is white. Floral bract is short, green, up to 3 cm. Sepals are fleshy, concave, obtuse and contracted near the apex; dorsal sepal is 4.5 mm; lateral sepals with the base form a chin with the foot of the column, 5 mm. Petals are acute, 3.5 mm. Lip is erect and parallel to the column, erect lateral lobes and triangular apex; intermediate lobe is semi-orbicular, fleshy, edges crenulate; disc with a conical elevated callus at the base; the whole lip measures 4.5 mm. Column is short, fleshy, with fleshy wings and a conspicuous foot.

Habitat: Epiphyte; in rain forest.

Flowering season: September-October.

Observations: As in all *Polystachya* flowering is consecutive and therefore long-lasting.

Polystachya masayensis

Reichembach f. 1855

■ **Description:** Up to 15 cm. tall. Pseudobulbs are small, 2 cm., covered with sheaths. Leaves up to 15 cm., with a conduplicate base and an obliquely retuse apex. Racemose inflorescence, occasionally with small branches near the base; peduncle is 7 cm., covered with sheaths. Flowers are yellow-green, callus and anther are white, the base of the lip's lateral lobes have purple patches. Floral bract is lanceolate and acute. Sepals are concave, apiculate; sepal is 2.5 mm; lateral sepals are 3 mm. Petals are apiculate, falcate and 2.5 mm. Lip is 2.8 mm., with erect lateral edges; intermediate lobe is fleshy, with crenulate edges, curved, retuse, with an apicule on the sinus, 1.2 mm; disc is completely covered by an elevated callus, extends from the base to near the apex of the lip. Column is short and 1 mm.

Habitat: Epiphyte in premontane forest.

Flowering season: October to December.

Observations: smallest *Polystachya* species, with a solitary Inflorescence on a short stem, relatively common on trunks and thick branches.

Ponera striata

Lindl. 1842

■ **Description:** 1 m tall or more. Stems are thin, sometimes branched, new stems with leaves, old stems are covered with brown verrucose sheaths. Leaves are dictic, erect, with a bifid acuminate apex, up to 20 cm. Sessile Inflorescence, with three to four terminal flowers and one to two flowers on the stems; covered with scarious tight sheaths. Flowers are green-white, with red-brown nerves over sepals and petals. Floral bract is brown, fibrous, 3 mm. Dorsal sepal is concave, with seven nerves, 6 mm., apiculate and fleshy apex; lateral sepals are obliquely triangular, 6 mm., adnate to the foot of the column forming a conspicuous chin, with curved apex. Petals with a triangular apex, trinerved, 6 mm. Lip is arched, recurved wide near the obtuse apex; disc with an elliptic and plain callus underneath the middle.

Habitat: Epiphyte; grows on low plains to 1000 m.

Flowering season: September to January depending on the location.

Observations: The plant looks like an *Epidendrum*, but its flowers grow on the main stem; very local distribution.

Ponera subquadrilabia

Corell. 1941

■ **Description:** Sometimes branched, up to 80 cm. tall, from a short rhizome, with thick roots. Stems are thin, with leaves on the apical portions, the basal portion covered with tight sheaths. Leaves are articulate with their sheaths, 13 cm. long, verrucose sheaths. Consistent Inflorescence with one to several flowers on a short terminal panicle; sometimes with one to two flowers on the nodes of the defoliate stem. Bract is verrucose, 2 to 3 mm. long. Sepals are fleshy, slightly verrucose on the outside, with seven nerves; dorsal sepal is obtuse, concave, 6 mm.; lateral sepals with curved apex, adnate to the foot of the column to form a prominent nerve, 6.4 mm. Petals are elliptic, round apex, and obtuse apicule, with erose edges, five nerves, 5.4 mm. Lip is arched, curved in natural position, with a wide and short nail, 8 mm.; disc with a trifid callus, immediately above the nail. Column is short, 5 mm, with a 4 mm... and three obtuse teeth on the apex.

Habitat: Epiphyte in wet forest.

Flowering season: January to March.

Observations: flowers grow along the main stem as well as at the bases of the leaves.

Ponthieva brenesii

Schlechter 1923

■ **Description:** With tick fleshy roots; leaves, stem, flowers and capsules are velvety; leafless during the flowering season. Leaves are 24 cm., green, attenuate towards the base, acute. Racemose inflorescence. 15 cm., with 2 to 15 flowers, green peduncle. Flowers are olive green, brown or green-yellowish. Dorsal sepal is 12 mm, with green brown stripes, outside is papillose; lateral sepals are 15 mm, olive green background with round red-brown patches, outside is papillose, underside is glabrous to glandular. Petals are joined to the middle of the column, 10 mm, green at the base and yellow towards the apex, with basal yellow patches. Lip is 4 mm, fleshy, green-yellowish and somewhat reddish towards the apex. Column is short and thick.

Habitat: Terrestrial or Epiphyte; grows on trunks, in wet areas.

Flowering season: November.

Observations: We have not seen this species; information from Hamer (2001).

Ponthieva ephippium

Reichembach f. 1857

■ **Description:** 20 cm. tall, leaves are basal, obtuse and membranaceous, 6 cm. Inflorescence is erect, with few flowers, racemose, peduncle is covered with several sheaths. Floral bract is

acute to acuminate, 5 to 10 mm. Flowers are small, with a 1 cm. pedicel ovary, white. Dorsal sepal is acute, 2 mm. wide; lateral sepals are oblique. Petals with a short nail. Lip with a short nail, with two calli near the base; intermediate lobe is small, reinforced on the apex, with a somewhat fleshy nail.

Habitat: Terrestrial on wet mountains.

Flowering season: September.

Observations: We have not seen this species; information from Hamer (2001).

Ponthieva racemosa

(Walt) Mohr. 1909

■ **Description:** Up to 20 cm. tall, with papillose roots. It has five to six basal leaves, acute, with crenulate edges, up to 8 cm., with a short and winged petiole. Spiky 4 cm. Inflorescence, with a glabrous peduncle underneath, pubescent above, with five to six sheaths which are 1 to 1.5 cm., with up to 20 flowers. Flowers are ochraceous, with brown sepals; petals, column and lip are white. Floral bract is 8 mm. Sepals are obtuse, trinerved; dorsal sepal is 4.5 mm.; lateral sepals are oblique, apically a sub-falcate, 5.5 mm. Petals are 4.3 mm, obtuse, with small cilia on the edges. Lip is sub-orbicular, with a conspicuous nail, sulcate, with erect edges, abruptly contracted towards the sulcate and curved apical lobe; the entire lip measures 5 mm, including the 1 mm. nail; disc is verrucose with three slightly elevated nerves. Column is erect and 4 mm.

Habitat: Terrestrial; grows on the edge of the forest and intervened cloud forest, 900-1300 m.

Flowering season: December to January.

Observations: Forms local populations in wet areas that are more or less exposed to sunlight, can be hard to find amid abundant terrestrial vegetation.

Ponthieva tuerckheimii

Schlechter 1906

■ **Description:** 20 cm. tall, with pubescent roots. It has three to six basal leaves, up to 8 cm., with a winged and green petiole which is 1 to 7 cm., blade with wavy edges, dorsally carinate. Floral scape is erect, thin, multifloral and with three pubescent sheaths which are 1.5 to 3.5 cm. on the peduncle. Flowers with white lateral sepals, brown posterior edges and green-brown underside; dorsal sepal is green-brown, column and lip are yellow-green, petals are cream-yellowish, callus is green. Floral bract is acuminate, papillose, up to 8 mm. Sepals are pilose on the outside and edges; lateral sepals are patent, divergent, united, 3 mm. from the base, elliptic, with acute and falcate apices, 5 mm. Petals are adnate near the apex of the column, connate near the truncate apex; free portion is 3 mm. Lip is sessile, with a short and thick nail, auricles are retrorse, falcate and acuminate near the base, outer half is erect and reflexed, slightly contracted above the middle; lower half is fleshy; horse-shoe-shaped callus, green, elevated and verrucose near the base. Column is erect and thin, with an erect foot.

Habitat: Terrestrial in cloud forest, above 1000 m.

Flowering season: July.

Observations: Deep shade, very local.

Prescottia oligantha

(Sw.) Lindl. 1840

■ **Description:** Terrestrial, up to 40 cm. tall, with fleshy roots. Leaves are basal, obtuse and acute, shortly petiolate. Floral scape is densely multifloral, spike generally short, cylindrical, up to 15 cm. Floral bract is 5 mm, same length as the pedicel ovary. Flowers are very small, white, green or pink, with the coherent perianth's segments at the base, dorsal sepal and petals are reflexed. Dorsal sepal is 2 mm.; lateral sepals are connate forming a gibbous chin. Petals are obtuse, 1.5 mm. Lip is fleshy, sacciform, with two retrorse auricles at the base, more or less apiculate at the tip, 1.5 mm. Column is short, laterally winged, up to 1 mm. long.

Habitat: Terrestrial.

Flowering season: September – October.

Observations: We have seen only two populations of this species, both are terrestrial growing in soil at 700-900 m.

Prescottia stackyodes

(Sw.) 1800

■ **Description:** Thin, up to 65 cm. tall. Leaves are basal, acute, 15 cm., besides a terete and 13 cm. petiole, with cartilaginous serrate edges. Floral spike is pink, partially covered with reddish sheaths which are up to 5 cm.; rachis is 28 cm. Flowers with an olive green lip, sepals and petals are pink and reflexed. Floral bract is acute 8 mm. Sepals are united at the bases and with the petal bases, reflexed. Petals are acute, 3 mm. Lip is sub-erect with curved edges; lateral edges are slightly lobulate in the center with superimposed lobes, 3.5 mm, including the 0.5 mm. basal auricles, 4.5 mm. wide. Column is short, rigid, with a small anther and big pollinia.

Habitat: Epiphyte on old, fallen and very rotten trunks, and at the base of old trees in the cloud forest above 1000 m.

Flowering season: February to August.

Observations: Even though it is quite common, only a small percentage flower in a given year.

Prosthechea abbreviata

(Schlechter) W.E. Higgins 1997

■ **Description:** With elongated rhizome and fusiform pseudobulbs, 6 cm., somewhat compressed, bifoliate. Leaves are green, up to 10 cm., with retuse apex. Apical Inflorescence, racemose, short, 3 to 6 flowers, with peduncle and a 1 cm. long sheath; raceme is 2 to 4 cm. Flowers are erect, patent, greenish-white, with several short and intense violet stripes on the lip and longitudinal and violet stripes on sepals and petals. Sepals and petals with curved edges; dorsal sepal is 11 mm.; lateral sepal is 11 mm, carinae. Petals are spatulate, 10 mm. Lip is elliptic, basal edges are curved and somewhat wavy, 8 mm.; disc with a basal 3mm. shortly pubescent callus. Column is 7 mm,

with tridentate apex; the central tooth with an erect protuberance. Anther is orange with 4 cells.

Habitat: Epiphyte, creeping, in open fields and the cloud forest caps.

Flowering season: March to June.

Observations: Even though it is not rare, it is less conspicuous than other species which are bigger, e.g. *P. fragrans* in the same habitat.

Prosthechea baculus

(Reichembach f.) W.E. Higgins 1997

■ **Description:** Erect, up to 60 cm. tall. Pseudobulbs are slightly compressed, bifoliate, up to 30 cm., partially covered with brown sheaths, scarious, up to 12 cm. Leaves are acute, up to 20 cm. Terminal Inflorescence with two very fragrant flowers, growing from a 5 cm. spathe; strong peduncle, compressed, 2 cm. Flowers are white-ivory with violet stripes, patent. Floral bract is very small, 3 mm. Sepals are acute, with revolute edges; dorsal sepal is 3.5 cm.; lateral sepals are oblique, 3.8 cm. Petals are acute, 3.5 cm. Lip adnate to the middle of the column, auriculate at the base, with curved auricles, 2 cm.; disc with a purple nerve and a slightly elevated callus, with a slight thickening from the base which ends in 4 teeth or lobes. Column is short, 8 mm, trilobed at the apex, with a bifid, erect tooth on the rear lobe.

Habitat: Epiphyte in oak forest.

Flowering season: Usually from March to May, occasionally October and January.

Observations: At first sight the plant looks like an *Arpophyllum*, but this has two terminal leaves instead of one.

Prosthechea brassavolae

(Reichembach f.) W.E. Higgins 1997

■ **Description:** With creeping rhizome; pseudobulbs are somewhat compressed, erect, spaced at a 10 cm. intervals bifoliate. Leaves are dark green, 20 cm., coriaceous, carinate, top is dark green, underside is lighter. Terminal Inflorescence, raceme with three to eight flowers and 25 cm. Peduncle at the base with a 6 cm. spathe. Flowers are green-yellowish with a white-violet lip. Sepals are green yellowish, 3.5 to 4.5 cm., reflexed edges. Petals are 3.5 to 4 cm. with the same color as the sepals, reflexed edges. Lip is 35 mm, adnate to the column with a 10 mm. nail, dilating up to 14 mm. wide on the centric portion and attenuating towards the acuminate apex, white with red-violet apex; disc with 2 white elevated calli, facing inwards and a carina up to the apex. Column is 11 mm. long, curved, dark green with purple patches, tridentate, with a longer tooth, lateral teeth are purple.

Habitat: Epiphyte in pine and oak forest, 1000-1400 m.

Flowering season: May and June.

Observations: This species grows on the canopy where it is exposed to sunlight and wind, it is hard to adapt to warm climate.

Prosthechea chacaoensis

(Reichembach f.) W.E. Higgins 1997

■ **Description:** With creeping rhizome. Pseudobulbs are 10 cm., compressed, green, when young are covered with scarios sheaths that disappear. Leaves are green, 35 cm., conduplicate at the base, coriaceous, carinate. Inflorescence is a terminal raceme with appproximately three to eight flowers. Flowers are white-green with purple nerves on the lip. Sepals are 20 m. m, white-green with curved edges; dorsal sepal is 5 mm. and lateral sepals are 7 mm. wide, acuminate. Petals are 17 mm, same color as the sepals. Lip is joined with the lower half of the column, free portion is unguiculate and dilated in an orbicular lamina, concave, shortly apiculate on the 15 mm. apex, green to green-whitish, with three short central nerves on each side, with a white callus, 6 mm. Column is short, thick, 7 m, apically trilobed, lateral lobes are longer and more acute than the intermediate lobe, green-whitish, with two purple lines on the upper half.

Habitat: Epiphyte; 300-800 m., mainly in gallery forest or premontane, along rivers and streams.

Flowering season: February to July.

Observations: Very common in the premontane zone in the Center to the Pacific of the country.

Prosthechea chondylobulbon

(Rich & Gal) W.E. Higgins 1997

■ **Description:** With 15 cm. pseudobulbs, attenuate towards the base and the apes, compressed, surcate, light green with olive green patches, with three to four leaves. Leaves are green, 24 cm., coriaceous, obtuse and emarginated. Terminal peduncle is 8 cm., with an 8 cm. spathe and approximately five flowers. Flowers are white-yellowish, with purple nerves on the lip. Sepals are 30 mm, green yellowish, acuminate, carinae on the underside. Petals are lighter than the sepals, 22 mm, without carinae. Lip is 20 mm, white background with purple nerves, somewhat concave, with curved lateral edges. Disc with a white, elevated and surcate callus. Column is 6 mm, bilobed at the apex, with a dorsal carinate that ends in an apicule between the lobes, green yellowish with purple patches at the base and the dorsal part.

Habitat: Epiphyte in wet areas and pine forest.

Flowering season: August to September.

Observations: We have not seen this species; information from Hamer (2001).

Prosthechea cochleata

(L.) W.E. Higgins 1997

■ **Description:** Pseudobulbs are compressed, green, 12 cm., covered with scarios sheaths. Leaves are green, 30 cm., acute. Terminal inflorescence, 25 cm., with 12 to 15 flowers, in some specimens flowers are successive and in other cases all flowers open in synchrony. Flowers are showy, green yellowish, with dark purple lip. fragrance of honey. Sepals are 40 mm, green yellowish, with few brown-red patches, very reflexed edges. Petals have the same color as the sepals, 30 mm, reflexed edges.

Inverted flower with lip on top, 2.6 cm. wide, adnate to the lower half of the column, concave, basal portion is green yellowish with very pronounced dark purple nerves; apical portion is dark purple with green yellowish nerves, orange edges; disc with a yellowish callus, two to three elevated nerves. Column is green yellowish or cream with dark purple patches, somewhat dilated towards the apex.

Habitat: Epiphyte in semi-tropical and dense forests.

Flowering season: All year.

Observations: This is one of the most popular species in cultivation, it is well adapted to cultivation but is no longer very common in the wild.

Prosthechea fragrans

(Sw.) W.E. Higgins 1997

■ **Description:** With somewhat compressed pseudobulbs, unifoliate, very variable in size, when young, they are covered with scarios sheaths, imbricate. Leaves are coriaceous, 20 cm. Racemose Inflorescence; peduncle at the base with a conduplicate 2 cm. spathe. Flowers are fragrant, whitish, with purple radial stripes on the lip. Dorsal sepal is 21 mm.; lateral sepals are 22 mm.; petals are 21 mm.; lip is joined to the base of the column; free portion is dilated on the simple lamina, apiculate, 15 mm.; disc with a V-shaped callus at the base, with two small parallel calli; column is nailed, trilobed at the apex, 7 mm.

Habitat: Epiphyte in the canopy of dense non-desciduous cloud forests, 800-1500 m.

Flowering season: April to August.

Observations: Easy to recognize even without flowers it has 1 leaf only. Terminal is above the pseudobulb. In cultivation, it has little resistance to drought and requires more water than *P.cochelecta* and *P.chacaoensis* which have somewhat similar pseudobulbs.

Prosthechea livida

(Lindley) W.E. Higgins 1997

■ **Description:** With 5 cm. pseudobulbs, slightly compressed, covered with scarios sheaths when young. Leaves are dark green, 12 cm., carinate. Terminal Inflorescence, 25 cm., raceme with successive flowers, leaving one to two flowers open simultaneously. Flowers are inconspicuous, brown reddish to greenish. Sepals are 10 m. m, green outside, underside with greenish background, longitudinal, transverse nerves are reddish-brown quadrate. Petals are 9 mm, spatula-shaped and quadrate as sepals. Lip adnate to the base of the column, cream-yellowish background with purple nerves. Disc with a purple callus over a white background which disintegrates into several verrucose calli, irregular and whitish on a reddish background, wavy edges. Column is 5 mm, yellowish, brown-reddish on top and trilobed at the apex.

Habitat: Epiphyte in very wet areas.

Flowering season: May to June.

Observations: We have seen this species only in cultivation in Costa Rica.

Prosthechea ochracea

(Lindley) W.E. Higgins 1997

■ **Description:** Pseudobulbs are erect, elongated, 6 to 9.5 cm., covered with whitish scarios sheaths, dark green, with two to three leaves. Leaves have very variable colors, 15.5 to 33 cm., dark green. Terminal inflorescence, racemose, 5 to 10. Flowers are green yellowish, lip is pale yellowish or whitish. Sepals are 6 mm, green yellowish, fleshy, thickened edges and apex. Petals are 5.5 mm, obtuse, same color as the sepals. Lip is joined to the foot of the column, with curved lateral lobes surrounding the column, 6 mm. Lateral lobes are big, 1.5 mm, wavy edges; intermediate lobe is obtuse and wavy; disc with an elevated, wide and surcate callus from the base of the lip up to the base of the intermediate lobe. Column is 4 mm, whitish and green at the base; with dentate lobes. Capsule is 1 cm. and triangular.

Habitat: Epiphyte; grows in pastures and cloud forest, 1000-1600 m.

Flowering season: April to June.

Observations: One of the most common species in cloud forest in Nicaragua's northern region, but not appropriate for cultivation out of its wet and cold habitat. Plants appear to require sunlight, water, and cold.

Prosthechea pygmaea

(Hook.) W.E. Higgins 1997

■ **Description:** With small pseudobulbs, compact, up to 22 mm. leaves are green, 40 mm. Terminal Inflorescence, generally with a solitary flower, 1 cm. long, covered with several brown and scarios sheaths, up to 1.5 cm. Sepals and petals are light green; lip is white, with an acuminate and red apex. Dorsal sepal is 5.2 mm, thickened at the base, lateral sepals are acuminate, connate at the bases. Petals are 4 mm, thickened apex. Lip is 3 mm, adnate to the middle of the column, with big round lateral lobes and a small acuminate intermediate lobe. Column is 3 mm.

Habitat: Epiphyte on oak trees growing in moist areas at high altitudes.

Flowering season: November and December.

Observations: Flowers mostly cleistogamous self pollinating, very few open in the plants we have seen.

Prosthechea radiata

(Lindley) W.E. Higgins 1997

■ **Description:** Pseudobulbs are 11 cm., compressed, green, somewhat surcate, with two to three leaves. Leaves are coriaceous, 23 cm., green. Terminal Inflorescence, raceme with two to seven flowers, 7 cm., with a short sheath at the base. Flowers are green whitish with purple stripes on the lip. Sepals are 16 mm, pale and unpolished green, greenish underside. Petals are 15 mm, pale and unpolished green, underside with a green carina. Lip adnate to the middle of the column, 15 mm, concave, shell-shaped, with curved edges; underside with a carina that ends in an apicule on the apex; apex is round and emarginate, the base has elevated auricles, edges of the lip are wavy. Disc is 5mm. pale yellowish with purple stripes, fleshy

and pubescent. Column is 8 mm, green, triangular, with laciniate intermediate lobe.

Habitat: Epiphyte; grows in premontane forest, at 1000 m. in the Dipilto mountains.

Flowering season: June to August.

Observations: Pseudobulbs are similar to those of *P. brassavola*, flowers are similar to those of *P. chacaoensis*, but three dark spots on the lip instead of two help to differentiate this species.

Prosthechea rhynchophora

(A. Rich. & Gal.) W.E. Higgins 1997

■ **Description:** Up to 20 cm. tall, with creeping rhizome, spaced at 1 cm. intervals. Pseudobulbs are fusiform, slightly compressed, up to 4 cm., covered with big, greenish and translucent sheaths. It rarely has two leaves on the pseudobulb apex, dorsally carinate, acute and conduplicate at the base. Terminal inflorescence, 10 cm. long, laxifloral, with approximately six flowers; peduncle growing from a linear sheath, brown, 2 cm. long. Flowers with yellow greenish petals and sepals, brown bases, column and lateral lobes of the lip are white, intermediate lobe of the lip has the same color as the sepals, callus and anthers are orange. Floral bract is green and triangular. Sepals are acuminate, 18 mm.; petals are 14 mm, attenuate towards the base and the acuminate apex. Lip is trilobed near the base, lateral lobes surrounding the column, intermediate lobe is shortly lanceolate, 7 mm.; disc is bicallose between the lateral lobes. Column is robust, 4 mm, with a 1 cm. conspicuous dorsal appendix.

Habitat: Epiphyte; grows in wet forest.

Flowering season: All year.

Observations: We have not seen this species; information from Hamer (2001).

Prosthechea vespa

(Vell.) W.E. Higgins 1997

■ **Description:** 45 cm. tall, pseudobulbs are thin, linear, attenuate towards both extremes, up to 30 cm., covered with three dictic sheaths. Three apical leaves, green, up to 18 cm. Apical racemose inflorescence, up to 15 cm., including the peduncle which has up to 15 flowers. Flowers are fleshy, with greenish-yellowish petals and sepals with red-violet patches, column has red stripes, lip is white with red patches on the apex. Floral bract is 5 mm. Dorsal sepal is 12 mm.; lateral sepals are 12 mm, concave, apiculate, carinate. Petals are thinner, concave, 10 mm. Lip adnate to the middle of the column, 6 mm, fleshy apex, acute, carinae; disc is almost entirely open from an elevated callus, fleshy, sulcate, soft and curved, basal portion is short and covered with papilla. Column is short, with three triangular apical teeth; basal portion is papillose.

Habitat: Epiphyte in cloud forest, 900-1200 m.

Flowering season: May, September and October.

Observations: Even though it has a wide distribution, it is generally found as solitary plants. Tubular pseudobulb like that of *Arpophyllum* or *P. baculus*, but with three apical leaves.

Psilochilus macrophyllus

Ames 1922

■ **Description:** Thick, branched, pale green, stems and underside of the leaves and ovary are covered with finely elevated black patches. Roots are fleshy, irregular in diameter, covered with white hairs. Stems are fleshy, attenuate from a 6 mm. width on the apical portion to 3 to 4 mm. at the base, with tight and fleshy sheaths at the base, 2 to 3 cm. long. Leaves are rigid, with tree dorsal carinae, the longest is 8 cm. Inflorescence with one to three racemes on the stem's apex, with one to two flowers; raceme is 2 to 6 cm. long, with up to eight 2 cm. bracts, surrounding the rachis. Flowers with green sepals, petals are green-whitish, lip is white. Sepals with a dorsally carinate central nerve, with a sub-acute and conduplicate apex; the lower half is rigid and fleshy, 3 mm. wide; dorsal sepal is 1.9 cm., foliar lateral sepals are 1.8 cm. Petals are linear, with thin texture, 18 mm. Lip is widely spatulate, trilobed in the outer half, 16 mm., Column with an arched apical portion, with a wide and conspicuous tooth on each side of the rostellum.

Habitat: Terrestrial in cloud forest, 1200-1500 m.

Flowering season: December.

Observations: Flowers open very little, leaves with green dorsal and purple ventral side.

Psilochilus modestus

Barb. & Rodr. 1882

■ **Description:** Thick, with purple stems and creeping rhizome, with fleshy pilose roots. Leaves are acute, with purple underside, green on top, with three dorsal carinae, up to 7.5 cm., articulate with long sheaths, 2.5 cm. Inflorescence is short, approximately 2.5 cm., with a 1 cm. peduncle, with two to three successive flowers and approximate imbricate sheaths. Flowers with green petals and sepals, white lip and green calus. Floral bract is up to 10 mm. Sepals are 8.5 mm, dorsally carinate; lateral sepals are falcate. Petals are falcate, trilobed past the middle; intermediate lobe is cordiform, acute, with erose edges, 3 mm, with a 3 mm. wide isthmus underneath the base; lateral lobes with acute curved apices; disc with an oblong callus, elevated, from the base to over the intermediate lobe. Column is 8 mm, without wings, with a triangular tooth on each side.

Habitat: Terrestrial in cloud forest.

Flowering season: July.

Observations: Even though recent literature classifies this taxon as a synonym of *P. macrophyllum*, we have seen very small plants without purple on the underside or raised black patches in Dantali-Diablo and Mount Musún, so we prefer leave this taxon for now.

Psychopsis krameriana

(Reichembach f.) H.G. James 1975

■ **Description:** Up to 1 m tall, with laterally compressed pseudobulbs, up to 4 cm. Leaves are oblanceolate, up to 25 cm., uniformly green, sometimes with fine purple patches. Flo-

ral stem from the base of the pseudobulb, finely terete, up to 90 cm. long. Produces solitary flowers in succession, big and showy; dorsal and lateral petals are fine and elongated, up to 5 cm., with crenulate edges, reddish-orange; lip is trilobed, with wavy edges, reddish edge with yellow center; lateral lobes are triangular and central lobe is widely rounded, up to 4 cm.

Habitat: Epiphyte on trunks in open fields with rainy weather.

Flowering season: December to March.

Observations: Rare with slow growth, in Nicaragua it is known only near the San Juan River. It seems to require abundant sunlight and water several times a day, but roots should not be permanently moist, in other words, the substrate should not be kept humid.

Restrepia muscifera

(Lindley) Reichembach f. ex. Lindl. 1859

■ **Description:** Erect, glabrous, up to 15 cm. tall. Stem is thin, unifoliate, up to 10 cm., completely covered with inflated sheaths, striped, apiculate, dorsally carinate. Leaves are green, shiny, purple undersides, coriaceous, tridentate at the apex, 6 cm., with a 4 mm. petiole. It has one to several peduncles, 1 cm. Flowers are patent, solitary, with red patches and stripes over the yellow base. The apex of the petals and the dorsal sepal is orange, with auricles of the same color at the base of the column. Dorsal sepal is linear, inflated at the base and ending in a papillose apical plate, 9 mm.; lateral sepals are connate to the middle, concave at the bases, edges and surface are papillose, 8 mm. Petals are filiform, thickened at the bases and ending on a 6 mm. papillose plate. Lip is 5 mm, obtuse intermediate lobe, falcate lateral lobes, with a short and wide nail. Column is arched, 3 mm, dilated and winged at the apex, with a short foot and two orange auricles at the base.

Habitat: Epiphyte; in the cloud forest canopy, 1000-1300 m.

Flowering season: Irregularly throughout the year.

Observations: Forms isolated colonies, very disperse in North Central Nicaragua not very common.

Restrepiella ophiocephala

(Lindley) Garay & Dunsterv. 1966

■ **Description:** Erect, with creeping rhizome, up to 45 cm. tall. Secondary stems are up to 25 cm., with 2 brown sheaths, maculate, tubular. Leaves with a sulcate and 2 cm. long petiole, coriaceous, obtuse at the apex, emarginated, 20 cm. fasciculate Inflorescence to the base of the leaf, with 1 to 3 fleshy, whitish-yellowish flowers, with purple patches. Floral bract is 1.1 cm. Sepals with the lower half white yellowish, the upper half has purple patches and stripes. Dorsal sepal is concave underneath, convex above, papillose on the inside, 1.7 cm., with seven nerves; lateral sepals are united up to a bifid apex, 1.4 cm., with six nerves. Petals are green yellowish, translucent, with red patches near the apex and a red base, somewhat spatulate, round apex, with five nerves, 5 mm. Lip is articulate with the foot of the column, fleshy, yellow with few purple patches, 3 mm, channeled in the center. Column is short, 2 mm, tridentate on the apex.

Habitat: Epiphyte in cloud forest.

Flowering season: December.

Observations: When not in flower it looks like big *Pleurothallis/Stelis*, flowers are usually cleistogamous and few open widely.

Rhyncholaelia digbyana
(Lindley) Schlechter 1918

■ **Description:** Compact, with short pseudobulbs, compressed, unifoliate, 4 to 6 cm., green, covered with imbricate sheaths, scarious. Leaves are apical, green whitish, with purple edges, coriaceous, 10 cm. Flowers are solitary, big, showy, subsessile on the apex of the pseudobulb, pedicel ovary is elongated, 8 cm. long, covered with compressed sheaths, brown and 6 cm. Sepals are whitish to yellow greenish, 60 mm. Petals with the same color as sepals, outside is somewhat pink, 55 mm. fringed lip, whitish to yellowish, tubular basal portion, 5 cm., truncate at the apex; disc with a small basal callus, green with dark red spots. Columnis short, green, with five teeth on the apex, 1 cm., with eight yellow pollinia.

Habitat: Epiphyte in cloud forest, above 1000 m.

Flowering season: December, January, April.

Observations: This species has been found only in the northern border a couple of times.

Rhyncholaelia glauca
(Lindley) Schlechter 1918

■ **Description:** Compact, with short pseudobulbs, compressed, unifoliate, 4 to 6 cm., green, covered with imbricate sheaths, scarious. Leaves are apical, green-blue, with purple edges, coriaceous, 3 cm. Flowers are solitary, big, showy, subsessile on the apex of the pseudobulb, with an elongate 8 cm pedicel ovary. covered with compressed sheaths. Sepals are whitish to yellow-greenish, 60 mm. Petals have the same color as the sepals, outside is somewhat pink, 55 mm. Lip is whitish to yellowish, basal portion is tuberos, 5 cm., truncate at the apex; disc with a small basal callus, green, with dark red spots. Column is short, green, with five teeth on the apex, 1 cm., with eight yellow pollinia.

Habitat: Epiphyte in sunny areas, around 1000 m., in oak forest on the Dipilto mountain range.

Flowering season: January.

Observations: Southern distributional limit in the northern Nicaraguan border, more common in Honduras.

Rhynchostele beloglissa
(Reichembach f.) Dressler & N.H. Williams 2002

■ **Description:** Grows to 50 cm., white, 3-4 mm diameter, the rhizome is creeping and covered with an imbricate scaly sheath. Pseudobulbs are laterally compressed, accipital, unifoliate, and partially hidden behind foliar sheaths. Very thin leaves elliptically narrow, sharp, dorsally carinate and conduplicate at the base. Peduncle is 20 cm. high to the first flower, which is erect, with several tight oval sheaths. The Inflorescence is 4 to

5 flowers, which have yellow-greenish petals and sepals, green-yellowish lips, with an orange callus and nail. The floral bracts are rounded lanceolate, and the ovary has a 2-3 cm. long pedicel. The sepals are coriaceous with duplicated and concave apex which have 5 nerves. Petals are spatulate, rigid, erect and with three nerves with a translucent apical half. The lip is panduciform with a wide, retuse apex; it also has a trapezoidal and papillose callus, with a truncate apex and erect borders, very fleshy and projected over the flat part of the lip. The column is densely papillose with two yellow pollinia.

Habitat: Epiphyte in pine forest 1200- 1500 meters.

Flowering season: august-sept.

Observations: Previously reported only once by Hamer (2001), we have not seen it and therefore base information on Hamer (1982, 2001).

Rodriguezia compacta
Schlechter 1925

■ **Description:** Up to 10 cm. long, with roots from the base of the pseudobulbs and along the rhizome. Rhizome is creeping, slightly branched. Pseudobulbs are unifoliate, covered with sheaths having foliar limbs, compressed, 1.5 cm. Leaves are sessile, with conduplicate base and an obliquely retuse apex, up to 6 cm. Inflorescence from the base of the new shoot, generally two flowers with a very short and arched peduncle, somewhat pendant. Flowers are slightly compressed, green-whitish, with yellow nerves on the disc and a yellow throat; orange rostellum. Floral bract is largely acuminate, 3 to 4 mm. Dorsal sepal with five nerves, with apical edges, concave, 2.7 cm.; lateral sepals are connate, with bifid apex, tubular in natural position, with sacciform base, 3 cm., including the spur of the lip. Petals with crenulate apical edges, five nerves, oblique. Lip with a curved linear spur, 4 cm., including the spur; disc is papillose where it joins the column; intermediate nerve is verrucose up to the apex. Column is thin, 1.7 cm., with two short teeth and two long wings; the base of the column is papillose.

Habitat: Epiphyte in wet forest on the Atlantic slope, 0-200 m.

Flowering season: September to December.

Observations: Not showy, inconspicuous and not common, apparently restricted to nearly virgin forest.

Stenorrhynchos lanceolata
(Aubl.) Rich. 1826

■ **Description:** Thick roots, fleshy and somewhat papillose. Leaves are absent during the flowering season, when present they are basal, acute, light green with pale green nerves, 27 cm. Floral scape is 30 to 40 cm., green or light purple, on the top portion it has short and whitish hairs, with 2.5 cm. sheaths, multifloral, with 10 to 20 flowers. Flowers are showy, 4.5 cm., including the 1 cm. petiole, white, pink, yellowish to reddish. Sepals have the same color as the flowers, 27 cm.; lateral sepals are 32 mm, connate, growing from a short chin. Petals are 25 mm, the same color as the sepals. Lip is 28 mm, lighter color than the sepals, the basal third has thickened edges, curved and

with whitish hairs, central portion dilated with curved edges, the apical portion is curved with dentate edges. Column is 1 cm., white to pink, with a 6 mm. Foot, elongate rostellum.

Habitat: Terrestrial in open field where no cattle is found, from the Atlantic slope to the sub-alpine zone in the Pacific, 0-700 m.

Flowering season: January to July.

Observations: Flower color is very variable, flowers earlier in wet areas, while in drier zones it waits for the first rains to rapidly produce the Inflorescence. This can be very variable, reddish being the most common. Perennial plant with roots that survive to produce new shoots, flowers every second year.

Sarcoglottis acaulis

(J.E.Sm.) 1806

■ **Description:** With basal leaves which are absent or present during the flowering season; flowers are green, with white spots when present, 25 cm., with a wavy. Floral bract is 35 cm., covered with acuminate sheaths which are 3 to 5 cm. Racemose inflorescence with 8 to 12 yellow-green flowers with green nerves. Flowers are arched, curved, with an acuminate and 4 cm. Floral bract. Dorsal sepal is 18 mm, curved in apical position; lateral sepals are falcate, 25 mm. Petals are thin, coherent to the dorsal sepal, 17 mm. Lip is 25 mm, with two terete calli at the base, fleshy, 5 mm, basal portion is surcate, curved edges, the central portion is somewhat dilated, and set (leaves as is) the apical lobe there is a conspicuous contraction, apical lobe is fleshy, curved, green, with dark green stripes; round apex and wavy edges.

Habitat: terrestrial; under shade, 400-1500 m.

Flowering season: January and February.

Observations: There is confusion about the taxonomy of this group; some sources synonymize *S. acaulis*, *S. rosulata*, *S. sceptrodes* and they might be correct. Flowers are similar, but we have seen a lot of variation.

Sarcoglottis hunteriana

Schltz. 1919

■ **Description:** Up to 70 cm. tall, with or without leaves during the flowering season. Stem is covered with numerous sheaths which are tight underneath and inflated on the apical portion. Floral spike is lax and multifloral, up to 20 cm. Flowers are arched, curved, green, with dark green nerves. Floral bract is acuminate, 4 cm. Dorsal sepal is attenuate towards the apex, 3.2 cm., with curved apex; lateral sepal is falcate, conduplicate. Petals, 3 cm. with a short lower half, acute. Lip is 2 cm., contracted near the apex, with an elongate and conspicuous isthmus darker green and more contrasting than sepals.

Habitat: Terrestrial in premontane rain forest.

Flowering season: December to February.

Observations: This species was recently reported for the Rio San Juan at los Guatzos by fabricio Diaz, we saw the plant, but not the flower.

Sarcoglottis rosulata

(Lindley) P.N. Don 1845

■ **Description:** Leaves present during the flowering season, rosette, green-bluish, with silver longitudinal stripes, sessile, 17 cm. Floral scape is up to 30 cm., olive green with white hairs and green sheaths, acute, 5 cm., multifloral, with 10 flowers. Flowers are light green with dark green stripes. Sepals are light green with dark green apices and green nerves, very conspicuous; dorsal sepal is 22 mm.; lateral sepals are falcate, 25 mm. and dorsally carinate. Petals are 20 mm, translucent, with dark green nerves. Lip is 21 mm, with green base, acute; intermediate portion is somewhat dilated, white, with curved edges, followed by a contraction and a curved apical lobe, dilated, 8 mm, pale green with dark green nerves. Column is 10 m. m, white, with a green foot.

Habitat: Terrestrial in mixed climate, shaded slopes.

Flowering season: December to March.

Observations: We have found isolated individuals in several sites, but we found a population on Mt. Musun which that may represent a different taxon.

Sarcoglottis sceptrodes

(Reichembach f.) Schlechter 1920

■ **Description:** Up to 70 cm. tall, with or without leaves during the flowering season. Stem is covered with numerous sheaths which are tight underneath and inflated in the apical portion. Floral spike is lax and multifloral, up to 13 cm. Flowers are arched, curved, yellowish green, with dark green nerves. Floral bract is acuminate, 4 cm. Dorsal sepal is attenuate towards the apex, 3.2 cm., with curved apex; lateral sepal is falcate, conduplicate. Petals, 3 cm. with a short lower half, acute. Lip is 4 cm., contracted near the apex, with an elongate and conspicuous isthmus, expanded to an intermediate lobe; basal portion is oblanceolate, ciliate on the center where the basal calli unite with the nail; calli are 6 mm.; apical lobe is 8 mm, with wavy and involute edges. Column is thin 2 cm. long.

Habitat: Terrestrial in premontane to rain forest.

Flowering season: December to February.

Observations: The most common *Sarcoglottis* often interspersed with *S. acaulis*.

Sarcoglottis schaffneri

(Reichembach f.) Ames 1905

■ **Description:** With thick fleshy roots, and leaves absent during the flowering season, when leaves are present these are basal, petiolate, 18 cm. Floral scape is 40 cm., pubescent in the apical portions and covered with acuminate, pale purple sheaths. Flowers are 26 mm, yellow-greenish to brown, with white lip. Dorsal sepal is 13 mm, pubescent on the outside; lateral sepals are connate, forming a small chin with the foot of the column. Petals are connate with the dorsal sepal, 12 mm, obtuse. Lip is 20 mm, with a long nail, with dilated, obtuse apex with brown veins; two thick and conspicuous calli at the base. Column is 5 mm.

Habitat: Terrestrial on lava fields and volcanic earth.

Flowering season: February.

Observations: We have not seen this species; information from Hamer (2001).

Sarcoglottis smithii

(Reichembach f.) Schlechter 1922

■ **Description:** Up to 30 cm. tall, with, or without leaves during the flowering season. Leaves, three to five, fleshy uniformly green lanceolate. Stem is covered with numerous sheaths which are tight underneath and inflated apically. Floral spike is lax and multifloral, up to 20 cm. Flowers are arched, curved, green, with dark green nerves. Floral bract is acuminate, 4 cm. Dorsal sepal is attenuate towards the apex, 3.2 cm., with curved apex; lateral sepal is falcate, conduplicate greater than 18mm long. Petals, 3 cm. with a short lower half, acute. Lip is 2 cm., contracted near the apex, with an elongate and conspicuous isthmus darker green and more contrasting than sepals.

Habitat: Terrestrial in premontane rain forest.

Flowering season: December to February.

Observations: This species was recently reported for the Rio San Juan at los Guatzos by Fabricio Diaz, we saw the plant, but not the flower.

Scaphosepalum microdactylum

Rolfe 1893

■ **Description:** Creeping elongate rhizome. Secondary stem is very short. Leaves are 5 to 10 cm., acute, attenuate towards the base to form a channeled petiole. Lateral inflorescence, with a dictic raceme, 8 cm.; peduncle is covered with three to four sheaths. Flowers are successive, small; dorsal sepal is 5 mm, concave in the lower half, convex and thickened on the outer half; lateral sepals are 5 mm, nearly all united, with two exterior carinae along the central nerves and ending in prolonged apices. Petals are 3 mm, acute, with two nerves. Lip is 2 to 3 mm, obtuse, ligulate, with three nerves on the basal portion and two elevated calli on the central part. Column is 2 to 3 mm, with a conspicuous foot and a tridentate apex.

Habitat: Epiphyte in mountainous areas.

Flowering season: April to September.

Observations: We have not seen this species; information from Hamer (2001).

Scaphyglottis behrii

(Reichembach f.) Benth. & J.D. Hook ex. Helml. 1883

■ **Description:** To 45 cm. tall, consisting of three to four stout pseudobulbs which are shortly fusiform from 4 to 20 cm., with small roots on the nodes where the pseudobulbs unite. New growth from the apex of the old pseudobulb. Terminal leaves, linear, up to 20 cm. long 6 mm wide. It has one to three terminal flowers on the pseudobulb apex. Flowers white 7 mm., patent. Sepals are oblong 3.5- 4 mm., lip 4mm long 2.3 mm. wide, column 4mm.

Habitat: Epiphyte. Atlantic rain forest up to cloud forest.

Flowering season: February to April

Observations: Similar to *S. graminifolia* which Hamer included in his 1983 treatment then excluded in 2001, whereas Ossensbach et al. 2007 include it again as a separate and valid species for Nicaragua.

Scaphyglottis bidentata

(Lindley) Dressler 2002

■ **Description:** Cespitose, sometimes branched, pendant, up to 60 cm. long. Stem consisting of several thickened elongate internode sections, the basal internode is stipate, up to 9 cm. long, longitudinally surcate, with several imbricate sheaths on the nodes. Thickened leaves on the apex of the sections, sessile, dictic, generally two, tridentate at the apex, surrounding the stem with its bases, 5 to 7 cm. long, coriaceous. Peduncle is short, 1 cm. long, hidden behind scarious bracts, imbricate. Terminal inflorescence composed of one to seven flowers. Flowers are patent, showy, orange to red, with a yellow basal callus. Floral bract is compressed, 1 cm. Pedicel ovary is arched, reddish 15 mm. long. Sepals with seven nerves, apicule, concave, dorsally carinate; dorsal sepal is 12 mm. long; lateral sepal is 12 mm. long. Petals are acute, curved edges in the upper half, contracted basal half, 10 mm. long. Lip is joined to the base of the column, making a sacciform cup, long and fleshy; disc with a fleshy, bifid basal callus, rounded and curved at the base, the center of the disc is thickened, from the middle to the apex.

Habitat: Epiphyte; at low altitudes.

Flowering season: July and August.

Observations: Very similar to *S. imbricata* but the yellow basal callus is contrasted with the red-orange. Apparently more common than *S. imbricata* in Nicaragua

Scaphyglottis bilineata

(Rchmb.f.) Schlechter 1918

■ **Description:** 30 cm. tall, consisting of three to four pseudobulbs which are shortly fusiform, with small roots on the nodes where the pseudobulbs unite. Terminal leaves, green, wide, with rounded apex, 5 to 9 cm.,. It has two to three flowers at the pseudobulb apex. Flowers patent, white, with top of column purple. Sepals are oblong; dorsal sepal is 5 mm.; lateral sepals are 5 mm., oblique, adnate to the foot of the column.

Habitat: Epiphyte.

Flowering season: December to February

Observations: Rare, although reported for the San Juan River, we have not seen it.

Scaphyglottis boliviensis

(Rolfe) B.R. Adams 1988

■ **Description:** Cespitose, sometimes pendant, up to 40 cm. stem is 12 to 25 cm. Leaves are linear, two on each pseudobulb apex, dorsally carinate, up to 13 cm. Inflorescence with two flowers on each pseudobulb apex. Flowers are successive, pat-

ent, whitish or cream, with 3 mm. floral bracts. Peduncle is 10 mm. Sepals are trinerved, 5 mm.; dorsal sepal is 2 mm. wide, forming a chin with the foot of the column. Petals turn more acute towards the apex, 5 mm. Lip is trilobed over the middle, 4.5 mm.; intermediate lobe is apiculate with crenulate edges; disc with a slightly elevated wide callus. Column is 5 mm, with a 1.2 mm. wide foot, with two triangular teeth on the upper edges.

Habitat: Epiphyte in rain forest.

Flowering season: October.

Observations: We have not seen this species; information from Hamer (2001).

Scaphyglottis crurigera

(Batem.) Ames & Corell 1942

■ **Description:** 8 to 30 cm. tall. Stems are bifoliate, when young are completely covered with scarious sheaths. Leaves are erect, green, membranous, obliquely retuse at the apex. Inflorescence in raceme, two to six flowers, thin peduncle. Flowers are white; floral bract is 4 to 5 mm. long. Acute sepals; dorsal sepal is 5 mm. long and lateral sepal is 6 mm. long and connate with the base joining with the foot of the column. Petals are 6 mm. long, obtuse and finely mucronate. Lip is 8 mm. long, with wavy and finely dentate edges, limited at the apex so that it makes two superposed lobes, strongly curved in the center. Column is 5.5 mm. long, including the 1 mm. foot.

Habitat: Epiphyte; grows on wet mountains.

Flowering season: March to April.

Observations: We have not seen this species; information from Hamer (2001).

Scaphyglottis fasciculata

Hook 1840

■ **Description:** Robust, erect, up to 40 cm. tall. Stems and pseudobulbs are thin at the base, dilated upwards, forming a fusiform pseudobulb, somewhat compressed, bifoliate, up to 10 cm. long; when young, covered with membranous sheaths. Peduncle is almost obsolete, less than 4 mm. long, hidden behind several imbricate bracts. Leaves are obliquely retuse at the apex, up to 10 cm. long. Inflorescence is densely fasciculate, up to 10 flowers. Flowers are patent, greenish-yellowish, sepals and petals are brown. Floral bracts are up to 5 mm. long, pedicel ovary of 15 mm., thin and stippled. Sepals are dorsally carinate, with acute fleshy apex; dorsal sepal is 7 mm. long; lateral sepal is oblique and 9 mm. long. Petals are concave, acute, 6.5 mm. long. Lip is adnate to the foot of the column, fleshy, basal edges are erect and surround the column, apical portion is reflexed, 7 mm. long, the apical fourth slightly contracted to a truncate apex with an acuminate apicule. Column is dilated towards the apex, 6 mm. long, with a prominent posterior tooth.

Habitat: Epiphyte; in rain forest up to 1300 m.

Flowering season: January

Observations: Easily recognized by the bifoliate pseudobulbs

with fine stemlike bases. Often forms new growth and new pseudobulbs from the apex of the old pseudobulb.

Scaphyglottis graminifolia

(Ruiz & Pav.) Poepp. & Endl. 1836

■ **Description:** Cespitose, up to 45 cm. tall. Secondary stems are stipitate, pseudobulbs are covered with scarious sheaths, 4 to 20 cm. Leaves with obtuse apex, one to two on each pseudobulb apex, up to 20 cm. Unifloral inflorescences, fasciculate or solitary. Flowers are white, floral bract is 3 mm. Sepals are dorsally carinate; dorsal sepal is 3.3 mm.; lateral sepals is 4.5 mm. Petals is 3 mm. Lip is 4 mm, erect and parallel to the column; intermediate lobe with retuse apex. Column is 4 mm, including the 0.5 mm. foot. Anther has 4 cells.

Habitat: Epiphyte in cloud forest.

Flowering season: February.

Observations: Grows in sunlight, often on thick trunks.

Scaphyglottis imbricada

(Lindley) Dressler 2002

■ **Description:** Cespitose, secondary stems with pseudobulbs, semi-erect, fusiform with several nodes and covered with persistent gray sheaths. Leaves in the apical portions of the stem, 5 to 16 cm. long, central nerve is surcate with the asymmetrical apex. Terminal inflorescence, single flowers from the white, compressed bract. Flowers with red orange sepals and petals, lip has the same color but with a yellow basal thickening. Dorsal sepal is 12 mm. long, lateral sepal is 13 mm. long; petals are 11 mm. long. Lip with is basal portion joined to the edges of the column to form a conspicuous nectary; the central nerve of the lamina is dorsally surcate, lip is 8 mm. long. Column and anthers are white.

Habitat: Epiphytic or lithophilic; grows on lowlands in wet forest.

Flowering season: September to October.

Observations: Flower uniform, red orange including the cal-
lus; apparently more common than *H. bidentata*. although nei-
ther is common.

Scaphyglottis laevilabia

Ames 1921

■ **Description:** 30 cm. tall, consisting of three to four pseudobulbs which are shortly fusiform, with small roots on the nodes where the pseudobulbs unite. Terminal leaves, with rounded apex, 5 to 9 cm., with a sulcate nerve. It has two to three flowers on the pseudobulb apex. Floral segments are membranous and patent. Sepals are oblong; dorsal sepal is 6 mm.; lateral sepals are 7 mm., oblique, adnate to the foot of the column, 4.5 mm, with erose edges, truncate and retuse apex; callose disc. Column is 4.5 mm, with short acute arms on either side of the stigma.

Habitat: Epiphyte.

Flowering season: January.

Observations: Paucifloral with inconspicuous flowers; we have seen it only on Mt. Quetzal, Jinotega.

Scaphyglottis livida
(Lindley) Schlechter 1918

■ **Description:** Cespitose, densely branched, erect, with roots at the nodes. Stems are clustered, generally several stems in a fascicle. Pseudobulbs are stipate, bifoliate, up to 10 cm. Leaves are rigid, erect, linear, sulcate, 5 to 20 cm. Flowers are yellow-greenish with purple patches, solitary or several in a fascicle. Dorsal sepal is 4 mm; lateral sepals are oblique, 3 mm, united at the base forming an inconspicuous chin. Petals are 3.5 mm. Lip is adnate to the foot of the column, arched, emarginated at the apex, with basal and elevated auricles, 2.7 mm. Column is short, thick, with a short foot.

Habitat: Epiphyte on rocks or pine and oak forests, above 1000 m.

Flowering season: November to January.

Observations: Similar to *Scaphyglottis robusta*, locally common.

Scaphyglottis longicaulis
S.Wats 1888

■ **Description:** Thin, densely cespitose, up to 25 cm. tall. Secondary stems are thin, slightly thickened, basal stems are stipitate, with two leaves, covered with scarious sheaths, up to 10 cm. long. Leaves are erect to arched, up to 15 cm. Flowers are small, white, sometimes with pink patches; column, apex of the lip and anther are red brown. Floral bract is acuminate, 3 mm. Sepals are slightly wider above the middle, acute, with conduplicate apex; dorsal sepal is 6 mm.; lateral sepals are falcate 7 mm. petals with an acute conduplicate apex, oblique, 6 mm, uninerved. Lip is trilobed at the apex, abruptly dilated, 6 mm.; lateral lobes are erect surrounding the column; intermediate lobe is short, wide, fleshy, triangular, and acute. Column is thin, 6 mm, with a 1 mm. Foot, forming a conspicuous chin with the lateral sepals; disc completely covered with a callus which is sulcate, elevated and verrucose. Anther is red and verrucose.

Habitat: Epiphyte; grows in low swampy plains near sea level and along rivers.

Flowering season: August to October.

Observations: We have not seen this species; information from Hamer (2001).

Scaphyglottis micrantha
(Lindley) Ames & Correll 1942

■ **Description:** Cespitose, secondary stems are thickened, fusiform to 15 cm, attenuate toward the apex, with a narrow stipate base covered with scarious sheaths, bifoliate. Leaves are 6.5 cm. long, green with purple spots; apices are marginate and obliquely bilobed. Inflorescence is terminal on the stems, raceme with multiple flowers, has up to two inflorescences per stem, purple peduncle. Flowers are whitish with purple nerves,

purple pedicel ovary, 5 mm. long. Sepal is 2 mm. long, whitish to greenish, translucent, shortly acuminate, edges are wavy, rounded and mucronate at the apex. Lip is 1.5 mm. long, trilobed, lateral lobes are curled, surrounding the column; intermediate lobe is rounded and mucronate at the apex, white, central portion is greenish, same as the rounded lateral lobes. Column is 1.5 mm. long, green and curved.

Habitat: Epiphyte; grows on main trunks in open premontane forest.

Flowering season: April and May.

Observations: Common, can grow to form dense mats in the trunk of big trees

Scaphyglottis minutiflora
Ames & Correll 1942

■ **Description:** Erect, branched, 60 cm. tall. Secondary stems are fusiform, 4 to 17 cm., covered with scarious sheaths, white. Leaves in pairs, patent, dorsally carinate, up to 15 cm., acute. Inflorescence is almost sessile, with several small flowers, surrounded in several fibrose bracts that form a bulk around the flowers. Flowers are green-whitish with violet stripes on the apical portion of the lip. Sepals are 2.5 mm.; lateral sepals form a small chin with the foot of the column. Petals are 2.1 mm. and acute. Lip is oblong, 3 mm, with crenulate edges, truncate apex, five nerves; lateral lobes are curved and rounded.

Habitat: Epiphyte or terrestrial; grows in rainy areas and lowlands.

Flowering season: September.

Observations: We have not seen this species; information from Hamer (2001).

Scaphyglottis prolifera
Cogniaux 1898

■ **Description:** Very variable in size, up to 15 cm. long. It has roots at the base and sometimes nodes on the branches. Stems shaped as pseudobulbs, attenuate towards both sides, 3 to 10 cm., generally with two secondary stems on the nodes, with tight sheaths, 1 cm. long at the bases. Leaves are ascendant to horizontal, with retuse apex, two at the apex of each pseudobulb, up to 3 cm. It has one to two flowers on the apex of each stem, sometimes on old nodes, white, with red brown anther, apex of the column and occasionally the apex of the lip are red brown; each flower is covered with several tight scarious sheaths. Sepals are acute, with five nerves; dorsal sepal is 4 to 5 mm.; lateral sepals are united forming a short and falcate chin. Petals are falcate, 4 to 5 mm. Lip is cuneiform and spatulate basal two thirds, fleshy, short, with erect edges, the apical third apical is thinner, with revolute edges; disc with a thickening along the nail, with a bifid callus. Column is thin, 6 mm, with a short foot.

Habitat: Epiphyte; from the Atlantic plain to 1500 m.

Flowering season: October to February.

Observations: This is the most common and dense of all the scaphyglottis species found in Nicaragua.

Scaphyglottis tenella

L.O. Williams 1941

■ **Description:** Erect and caespitose, up to 50 cm. tall. Stems are cylindrical and bifoliate; pseudobulbs, up to 10 cm. long, covered with tight brown sheaths. Leaves are membranous, acuminate, twisted, 20 cm. long. Inflorescence with 2 to 3 fasciculate flowers from the base of the leaves. Flowers are white, partially open. Several floral bracts with brown-scarious; sepals carinate, acute; dorsal sepal is 10 mm, with five nerves; lateral sepal is 11 mm, with seven nerves. Petals are acute, trinerved, 10 mm. long. Lip is slightly contracted underneath the middle and dilated, forming an orbicular intermediate lobe, acute with finely erose edges, basal portion is fleshy, with slightly erect edges, 11 mm. long near the base and with three nerves on the basal portion and five nerves on the intermediate lobe. Column is nailed, 6 mm. long, with a 3 mm. long foot, tridentate at the apex, slightly winged.

Habitat: Epiphyte in lowland rainforest.

Flowering season: November and December.

Observations: We have not found this species; information from Hamer (2001).

Scelochilus tuerckheimii

Schlechter 1911

■ **Description:** Patent or pendulous. Pseudobulbs are small. Leaves are coriaceous, conduplicate at the base and apex, but flat in the middle, 11 cm. Lateral inflorescence of the pseudobulb, raceme with five to six flowers. Flowers shiny, yellow to orange. Sepals are 10 mm, slightly concave; lateral sepals are connate up to the apices forming a short spur with the foot of the column. Petals are 13 mm, yellow, with 7 red purple longitudinal nerves; covered on the interior of the base with a two short white fuzz. Lip is 15 mm, complex retuse basal calli and two elevated. Hooks or horns on the basal third, 1.5 mm, there are two other wide and elevated calli before the expansion to the midlobe, somewhat hairy; lip is yellow with reddish to purple nerves. Column is 7 to 9 mm., dilated towards the apex.

Habitat: Epiphyte on tree trunks, 800-1600 m.

Flowering season: June to December.

Observations: We have not seen this species; information from Hamer (2001).

Schiedeella llaveana

(Lindley) Schlechter 1920

■ **Description:** Erect, up to 30 cm. tall. Stems are thin, pink and covered with tight acuminate sheaths. Leaves are dry during the flowering season, if present there are one to two cordate leaves. Floral spike is pale green, 6 cm., with approximately 10 flowers. Flowers are small, oblong, only the lip is somewhat patent; sepals and petals are greenish at the base and pink on the apices, the basal portion of the lip is green, the apical end is white. Floral bract with pink apex, 11 mm. Petals are obtuse, 5.5 mm. Lip with five nerves, intermediate nerve is red brown on the apical portion, thickened crenulate edges on the apical third, contracted past the middle, with small obtuse lobes after

the contraction, 9 mm. over the flattened lobe. Disc with two oblong, falcate, auricles curved at the base, basal portion of the disc is papillose. Column is 5.5 mm.

Habitat: Terrestrial on rocks and open fields.

Flowering season: April.

Observations: We have not seen this species; information from Hamer (2001).

Schiedeella parasitica

(Rich & Gal.) Schlechter 1920

■ **Description:** Leaves are dark green, limb is 4 to 6 cm., with a 4 cm. petiole, reddish-brown. Floral scape is 20 cm., purple, with white hairs near the top, sheaths are up to 6 mm, purple with white patches. Flowers are very spaced along the floral scape, 6 mm, purple with white hairs; long bract, acuminate. Sepals are light purple; dorsal sepal is 4.5 mm.; lateral sepals are 5 mm, connate at the bases. Petals are 4.5 mm, light purple. Lip is 5 mm, curved edges, white, green-brown nerves, without calli but auriculate at the base. Column is short, purple, pilose in the interior.

Habitat: Terrestrial, grows in undersory of cloud forest.

Flowering season: March and April.

Observations: We have not seen this species; information from Hamer (2001).

Schiedeella trilineata

(Lindley) Burns Bal. 1981

■ **Description:** Erect, glabrous, with fleshy roots and without leaves during the flowering season. Floral spike is 15 cm. tall, covered with scarious sheaths. Flowers are white to pale purple. Sepals are curved at the apices; dorsal sepal is 9 mm. long, adnate to the dorsal portion of the column; lateral sepals occur along the ovary, forming a 16 mm. cylindrical nectary. Petals are thin, 9 mm. long. Lip with a long nail, auricle in the base, lateral sides are curved; the apical third is conspicuously contracted and papillose; disc is pubescent at the base. Column is elongate, thin.

Habitat: Terrestrial; grows exposed to sunlight, in dry and muddy lands.

Flowering season: February.

Observations: We have not seen this species; information from Hamer (2001).

Schiedeella wercklei

(Schlechter) Garay 1982

■ **Description:** With thick fleshy roots, 30 cm., glabrous on the basal portions and pubescent apically. Leaves are basal, solitary, cordiform at the base, acute at the apex, with a thin channeled petiole, 3 cm., dark olive green, with a red carinate dorsal nerve. Floral scape with five somewhat inflated sheaths, acuminate and maculate, up to 3 cm. Laxifloral inflorescence, 10 to 12 flowers, with brown greenish petals and sepals, white lip. Floral bract is brown, acuminate, 1.5 cm. Sepals are ligulate; dorsal sepal is 5.5 mm., with round apex. Lip is slightly

trilobed more or less in the center, 5.5 mm. long, 2.7 mm. wide, across the lateral lobes and 2.3 mm. wide across the mid lobe; erose margin, midlobe is retuse, with an apicule on the sinus, the base has two lateral auricles, thickened, shortly unguiculate. Column is 4 mm., with cilia anteriorly.

Habitat: Terrestrial in very wet areas and loose soil.

Flowering season: February.

Observations: We have not seen this species; information from Hamer (2001).

Sievekingia suavis

Reichembach f. 1871

■ **Description:** With obovate pseudobulbs, angular or surcate, unifoliate, surrounded with scarious sheaths, surpassing the pseudobulbs. Leaves are acuminate, plicate, 13 cm., with a 10-15 mm. petiole. Pendant inflorescence, short, racemose, from the base of the pseudobulbs, with four orange flowers. Floral bract is inflated, 8 mm., several, slightly imbricate. Dorsal sepal is concave, 12 mm., acute; lateral sepals are 14 mm. Petals are orange and 10 mm. Lip is rhomboidal, with erect margin and patent apex, orange; disc with one to three raised carinae and a tridentate callus in the lower half. Column is orange, with green dorso, conspicuously winged.

Habitat: Small Epiphyte in rain forests.

Flowering season: April.

Observations: We have not seen this species; information from Hamer (2001).

Sigmatostalix guatemalensis

Schlechter 1911

■ **Description:** Up to 30 cm. tall. Pseudobulbs are compressed, unifoliate, covered with sheaths having foliar limbs, 2.5 cm. Leaves are erect, obliquely retuse, with a curved tooth at the apex, membranous, with up to six flowers which are very spread out on a 30 cm. peduncle with a node and a scarious sheath near the middle. Flowers are intense yellow, apices of the sepals and petals are green. Floral bract is thin, acuminate, 5 mm.; sepals and petals are reflexed, acute, distal half is concave, lower half is convex; dorsal sepal is trinerved, 8 mm.; lateral sepals connate up to the middle, binerved 8 mm. Petals are uninerved, 6 mm. Lip with a thin, fleshy and 2 mm. nail, lamina is 6 mm., sub-quadrate, with retuse apex and two curved auricles, retrorse on the crenulate base. Column is very thin, with a acuminate rostellum, 6 mm.

Habitat: Epiphyte in cloud forest.

Flowering season: November and December.

Observations: Relatively small, somewhat similar to *Oncidium cheiroporum* in the same habitat. Very local and uncommon.

Sobralia bletiae

Reichembach f. 1852

■ **Description:** Erect, up to 40 cm. tall. Stems are robust, with up to five leaves on the apical portion. Leaves are plicate, with

five prominent nerves, tridentate apex, 5 to 14 cm. Inflorescence generally has two terminal flowers, successive flowering. Flowers are cream, apical portion of the callus is orange. Sepals are apiculate, 2.3 cm. Petals are slightly falcate, acute, same length and width as the sepals. Lip is trilobed near the apex, with fimbriate apical margin, 2 cm.; disc with three raised carinae from the base, dentate lamina on each side of the central lamina which divides in three shorter lamina that continue up to the midlobe; apical portion of these is wavy, tuberculate, and raised. Column is thin, 2 cm., with falcate apical teeth.

Habitat: Epiphyte in rain forest.

Flowering season: November.

Observations: Previously known as *S. suaveolens*, the smallest Nicaraguan *Sobralia*; it has a fimbriate margin as *S. fragrans*, but with multiple leaves; smaller than *S. luteola* which also has multiple flowers.

Sobralia bouchei

Ames & Schweinfeld 1923

■ **Description:** Up to 1 m tall. Stems are rigid, yellow-green, slightly compressed, upper portion with approximately seven leaves, lower part is covered with brown maculated sheaths. Leaves are yellow greenish, with nine sulcate nerves on the underside, inside is plain, with one apicule, not tridentate, relatively rigid, up to 13 cm. It generally has two successive flowers, with white petals and sepals, sometimes with purple patches; apical portion of the lip is purple to blue-violet, the raised nerves on the throat are intense yellow. Sepals are acute; dorsal sepal is 6.5 cm.; lateral sepals are oblique, 6.2 cm. Petals are 5.7 cm., acute, with serrate margin on the distal half. Lip is trilobed, 6 cm., with a deeply retuse apical lobe and a round apicule on the sinus; apical margins are crenulate; disc with a plain callus, sulcate, flat, 1 cm. From the base, followed by seven conspicuously raised nerves to the middle of the lip where they become crenulate and verrucose; sometimes one or two nerves are slightly raised on the sides; basal calli are laterally obsolete. Column is nailed, 3 cm., slightly winged from the base to the apex; always with three anthers on the column, both laterals with two to four divisions.

Habitat: Epiphyte in rain forest.

Flowering season: May.

Observations: Previously known as *S. triandra*. We have seen only one specimen of this species which was found near Waslala, Matagalpa at 400 m.

Sobralia bradeorum

Schlechter 1923

■ **Description:** Up to 2 m tall. Stems are erect, rigid, not branching, with leaves on the apical portions only. Leaves are rigid, olive green, loosely wavy, patent, abruptly contracted towards an acuminate and tridentate apex, elliptic, 22 cm., with verrucose sheaths and brown glandular hairs. Flowers are solitary, successive, showy, smaller than *S. macrantha* Lindl, purple with a darker lip and a yellow throat. Sepals are 6 to 6.5 cm., acute, lower half is widely carinate. Petals are spatulate, with a long nail and dentate margin. Lip is 7 cm., apical portion is

somewhat retuse, distal half is deeply crenulate; disc with two yellow calli at the base, 1 cm., with three raised nerves from the base to the apex. Column is 4 cm., nailed, with two falcate apical teeth.

Habitat: Epiphyte and terrestrial in forest canopy and open meadows.

Flowering season: Generally all year, but more common in March.

Observations: It is possible that the species' name may change dressler personal communication, doubts that it is the same species described in Costa Rica. It has a highly variable flower in shape, color and even size; the purple variety is the most common.

Sobralia chatoensis

A.H. Heller & A.D. Hawkes 1966

■ **Description:** Up to 30 cm. tall, with foliose stems and leaves separated at 3-4 cm. intervals; basal portions are covered with sheaths having red patches. Leaves are up to 16 cm., with nine nerves, but only the central nerve is dorsally carinate. Flowers are relatively long, patent, sepals and petals are light purple, more pale towards the base, throat and disc are ochraceous brown, the sulcate portion of the central nerve is ochre-golden, basal callus is intense yellow, the anterior face of the column is yellow, with purple apical teeth. Sepals are acute, 7 cm., petals with a thin nail, slightly crenulate margin, 7 cm. Lip is elliptic, forming a tube that surrounds the column, 7 cm. when flattened, with crenulate apical margin; disc with a flat depression which is 5 mm. wide along the center, contains five raised nerves that extend up to the middle of the lip. Column is 4.5 cm., nailed only near the apex.

Habitat: Epiphyte; it seems to be endemic of Cerro Chato.

Flowering season: December to January.

Observations: Apparently a valid species, which Hamer and Hawkes indicated as being rare; we have not climbed Cerro Chato, which has a very steep slopes.

Sobralia chrysostoma

Batem. 1841

■ **Description:** Up to 1.5 m tall, with leaves on the apical portion, maculate sheaths covered with black hairs on the basal portion. Leaves are acuminate, 14 to 18 cm., with nine conspicuous nerves. Unifloral inflorescence, successive flowers. Flowers are big, showy, with white petals and sepals, the throat of the lip is orange, turning into yellow towards the apex, with white nerves, the apical margin of the lip are white. Dorsal sepal with nine nerves; lateral sepals are similar, with several radiant nerves, 9 cm. Lip with crenulate margin of the distal half, deeply retuse, 9 cm., with two linear basal calli which are 1.5 cm.; disc with five conspicuous nerves from the base up to above the middle of the lip, with several other short lateral nerves on both sides. Column is thin, nailed, 5 cm., with yellow and retrorse teeth.

Habitat: Epiphyte in tropical-wet forests.

Flowering season: Almost all year.

Observations: Previously known as *S. powellii*, a distinct species found in Panama, not in Nicaragua.

Sobralia crispissima

Dressler 2002

■ **Description:** 25 to 50 cm. tall. Stems are rigid, with leaves on the apical portions and maculate sheaths with black hispid hairs in the basal portions. Leaves are rigid, up to 15 cm., with nine prominent nerves and wavy margin, contracted to a sub-acuminate apex. Terminal inflorescence, unifloral. Flowers are successive, semi-patent, with white petals and sepals, lip with red violet patches and stripes, and a yellow throat. Sepals are somewhat fleshy, 4.8 cm. Petals are thinner than sepals, upper margin are slightly crenulate, 5 cm. Lip is slightly trilobed, outer half retuse, 4.5 cm.; disc with a quadrate callus, raised, with seven slightly raised nerves from the callus up to beyond the middle of the lip. Column is short, 2 cm., with two lateral teeth, longer than the intermediate tooth.

Habitat: Epiphyte in cloud forest.

Flowering season: September to November.

Observations: Hamer referred to it as *S. lindleyana*, which is now considered a different species not found in Nicaragua.

Sobralia decora

Batem. 1841

■ **Description:** Up to 2 m tall. Stems are branched, covered with apically maculate, hispid sheaths, to 5 cm.. Leaves are plicate, shortly acuminate, up to 18 cm., with seven nerves, underside of leaves generally purple. Flowers are successive, unifloral, uniform color; sepals and petals are pink, lip is darker especially on the margin, throat is intense red, generally with a white patch over the sinus of the lip, teeth of the column are purple. Dorsal sepal is 1.8 cm. wide; lateral sepals are falcate, 2 cm. wide. Petals with irregular margin, sulcate above and carinate below. Lip with reflexed anterior margin, the apical portion is slightly crenulate, round, retuse, with an apicule on the sinus; disc with up to 13 slightly raised nerves, from the basal callus to the sinus of the lip. Column is 3 cm., nailed near the apex, with 2 falcate lateral teeth.

Habitat: Terrestrial and epiphytic; grows in rainy to semi-dry areas, 20-1000 m.

Flowering season: Starts in September with successive flowers from each bract until it fertilizes up to April.

Observations: Branching is diagnostic in large plants, as is the purple coloration on the underside of leaves. Flowering is synchronized: all the flowers of the plant and most plants in the country flower on the same day and last for the morning of that day only. The next flowering round occurs about ten days later. This species is synonymous with *S. fenziiana*.

Sobralia fragrans

Lindl. 1853

■ **Description:** With thick roots, secondary stems are short, unifoliate, compressed. Leaves are green, coriaceous, with long

petiole, surrounding the base of the peduncles, conspicuously compressed, 12 cm. Flowers are yellow greenish, with a white lip. Sepals are 40 mm., apiculate, green yellowish, with a somewhat purple nerve on the underside. Petals are 38 mm., green yellowish. Lip is 40 mm., white with yellow to green yellowish central nerves, the basal two thirds forming a tube, surrounding the column, third part with a stripe on the edge; disc with several yellow lamina. Column is 18 mm. white.

Habitat: Epiphyte in tropical rain forests, 0-1200 m.

Flowering season: September to November.

Observations: Another species with synchronized flowering, unifoliate stems are diagnostic, the first flowering gives a flower on each stem, and then successive flowers where the flower was not pollinated.

Sobralia helleri

Hawkes 1966

■ **Description:** Up to 1 m tall. Stems are rigid, olive green, with red brown maculations over the sheaths. Leaves are dark green, plicate, relatively rigid, at 3 to 4 cm. intervals, acuminate, with nine carinate nerves. Flowers are solitary, successive, 6.5 cm., not wide open due to the connate sepals; sepals and petals are intense white with a touch of pink and orange, interior surface of the column is red. Sepals are somewhat fleshy, with seven nerves, apiculate, concave, 6.5 cm., connate by 1 to 2 cm. at the base; dorsal sepal is 2 cm. wide; lateral sepals are oblique, 2 to 3 cm. wide. Petals with seven nerves, the three central nerves are raised and very close to one another, obliquely elliptic, apiculate, 5.5 cm., with curved and serrate apical margins. Lip is 7 cm., deeply conical, up to almost sacciform, with retuse apex and thickened margins; with numerous indistinct nerves without elevation; disc with two linear calli, erose, papillose at the base, ending in two to three very short teeth. Column is elongated, thin, 4 cm.

Habitat: Epiphyte; 600-900 m. in wet forest.

Flowering season: May.

Observations: We have seen this species on Maderas Volcano only, where it produces few flowers.

Sobralia luteola

Rolfe 1898

■ **Description:** Erect, to 80 cm. tall. Stems with leaves on the upper portions, leafless on the lower portion. Leaves with tight sheaths, up to 17 cm., with five prominent nerves. Racemose inflorescence, with distic bracts, up to 10 flowers, where two to three grow at the same time. Flowers are patent, cream-yellowish, with an orange beard on the throat and purple apical margin. Floral bract is acute, 8 mm. Sepals are prominent, apiculate, 1 cm. wide; dorsal sepal is 3.5 cm.; lateral sepal is 3 cm.; petals are apiculate 3 cm. Lip is retuse, with crenulate apical margin, 3 cm.; disc with a 4 mm. basal callus in front of which is another raised callus, 4 mm. followed by five conspicuous carinae, interior apical portion is covered with long dense hairs. Column is 2 cm., with two apical teeth.

Habitat: Epiphyte or lithophile in rain forest and cloud forest habitats, 300-1000 m.

Flowering season: November and December.

Observations: The production of multiple simultaneous flowers on the same stem permits tentative identification, even when it is not flowering because it has multiple capsules on the same stem, characteristic not common in other Nicaraguan *Sobralias* because they stop flowering when a capsules grow.

Sobralia macrantha

Lindl. 1839

■ **Description:** Up to 2.3 m tall, with leaves on the apical portions, sheaths covered with black-green maculations. Leaves are shortly lanceolate, rigid, plicate, with seven carinate nerves on the underside, 20 cm., articulate with sheaths. Unifloral inflorescence, with successive flowers. Flowers are very big, showy, purple with a brown-purple disc in the center and yellow at the base; teeth of the column are purple. Floral bract is up to 6 cm. Sepals are 8 cm. apiculate. Petals with a conspicuous nail and wavy margin, apiculate, 8 cm. Lip is very long, with wavy and crenulate margin over the middle, 10 cm.; disc with five slightly raised nerves from the base to near the sinus, with two basal carinae which are 1 cm. Column is thin, 4 cm., with two conspicuous teeth on the apical portion.

Habitat: Terrestrial or lithophytic, rarely epiphyte in wet to semi-arid forests, oak forest and near rivers.

Flowering season: Twice a year: July-August and December-January.

Observations: The largest populations of this species we have seen are in oak forest where the plants can be more than 2 m tall, but have been heavily exploited and should be protected. Transplanted plants grow well but flower little if at all unless confined to pots.

Sobralia mucronata

Ames & Schweinfurth 1925

■ **Description:** Up to 50 cm. tall, robust stem, three to four leaves on the apical portion. Leaves are acuminate, tridentate at the apex, up to 35 cm. Flowers are patent, green whitish, with yellow apical lamina and yellow-brown nerves; sepals and petals with mucronate apices. Floral bracts are up to 2 cm. Sepals are 3 cm.; dorsal sepal is 9 mm. wide; lateral sepals are reflexed, 10 mm. wide. Petals are oblique, 2.8 cm. Lip with crenulate apical margin, 2.7 cm.; disc with two small calli at the base and five slightly raised calli that extend from the base up to near the apex, two carinae on each side of the central carinae rise abruptly forming a wavy, fleshy apical portion, 5 mm., with another short carina. Column is nailed, 1.6 cm., with two retrorse apical teeth.

Habitat: Epiphyte in premontane forest.

Flowering season: May, June, October.

Observations: Similar to *S. luteola* but the flower differences on the edge of the lip, generally unifloral occasionally with a double flower.

Sobralia sp.

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■ **Description:** Up to 1.5 m tall, with abundant roots. Stems are thin, covered with verrucose maculated sheaths, with leaves on the apical portions. Leaves are acuminate, up to 20 cm., pale green, prominent carinae. Flowers are solitary, successive, terminal; Sepals, petals and apical margin of the lip are pale purple, the lower half of the throat is pale purple. Sepals are 8 cm., apiculate; dorsal sepal is 1.5 cm. wide; lateral sepals are 1.5 cm. wide. Petals are 7.5 cm. with a short acute nail, no crenulate margin, sub-truncate apex, with a small triangular apicule. Lip is tubular at the base, 7.6 cm., slightly contracted towards the wavy margin, forming a deeply retuse apical lobe. Column is 3.5 cm. with thin wings on each side.

Habitat: Open meadows, 1000-1200 m.

Flowering season: May to October.

Observations: Belongs to the *S. macrantha* and *S. warscewiczii* group but with less wide and crenulate petals.

Sobralia warscewiczii

Reichembach 1852

■ **Description:** Up to 1.5 m tall, with abundant roots. Stems are thin, covered with verrucose, maculate sheaths, with leaves on the apical portions. Leaves are acuminate, with 11 nerves, up to 20 cm., pale green, prominent and carinate. Flowers are solitary, successive, terminal; sepals, petals and apical margin of the lip are red-purple, the lower half of the throat is yellow as is the apex of the lip. Sepals are 7.5 cm., apiculate, with nine main nerves; dorsal sepal is 2.1 cm. wide; lateral sepals are 2.5 cm. wide. Petals with a short, acute nail, 7.5 cm., with reticulate nerves, crenulate margin on the apical third, Apex is sub-truncate triangular. Lip is tubular at the base, 7.6 cm., slightly contracted toward the crenulate wavy margin, forming a deeply retuse apical lobe; disc with two yellow calli at the base, 1.5 cm., followed by three raised nerves that extend $\frac{3}{4}$ of the way up the lip. Column is 3.5 cm., with thin wings on each side.

Habitat: Epiphyte or terrestrial in wet forest.

Flowering season: Intermittently almost all year, especially in May.

Observations: In contrast to *S. macrantha* and other Nicaraguan *Sobralias*, the flower lasts for two to three days under the same conditions where others last one day or less.

Specklinia alexii

(Heller) Pridgeon & M.W.Chase 2001

■ **Description:** 5 cm. tall, creeping rhizome and unifoliate secondary stems, 1 to 1.5 mm. coriaceous 5 cm. leaves, including the 1 cm. petiole. Inflorescence is 6 to 8 cm., with filiform peduncle, green-reddish and with two successive 1.5 cm flowers. Flowers with petals and sepals red in the outer half, lower half of the sepals have white stripes. Lip is yellow with a red callus and an ochre apex, column with red foot and white anther. Sepals are connate to the bases; dorsal sepal is 1.3 cm., concave near the base, the rest is convex; lateral sepals are connate, up

to 3 mm, from the apex, 1.5 cm. Petals are fleshy, concave, 3.5 mm, with sub-acute apex. Lip is sulcate, 4 mm; apical portion is convex; apex is widely rounded and retuse, with an erose apicule on the underside, two rounded auricles near the edges and a pair of papillos calli near the base; the entire surface is finely verrucose. Column is 3 mm, with wide wings and a 2 mm. foot, apex with three teeth.

Habitat: Epiphytic in Atlantic rain forest and cloud forest.

Flowering season: May to October.

Observations: Forms big colonies on large trunks with sunny exposure but very local.

Specklinia brighami

(S.Watson) Pridgeon & M.W.Chase 2001

■ **Description:** Cespitose, 4 cm. tall. Secondary stems are unifoliate, 3 mm, covered with scarious sheaths. Leaves are coriaceous, 2 cm., including the conduplicate petiole, tridentate apex. Erect inflorescence with two to three successive flowers, raceme, filiform peduncle, 3.2 cm. Flowers are green-yellowish with red stripes on sepals and petals; dark red lip, yellow column with red stripes. Floral bract is 1.5 mm; sepals with three nerves, 5 mm, concave; apex is acute, dorsally carinate; dorsal sepal is 2 mm. wide; lateral sepals are jointed in the middle, 3.2 mm. wide. Petals are translucent, spatulate, acute with two nerves, 2 mm. Lip is fleshy, 2 mm, attenuated towards the obtuse apex, arched, with a short nail and on each side of the nail is a tooth; disc with two thickened carinae, sulcate between the carinae which extend from the nail to near the apex. Column is arched, nailed, with conspicuous wings on the upper portion and three teeth on the apex.

Habitat: Epiphyte in lowland rain forest.

Flowering season: March to June.

Observations: We have not seen this species; information from Hamer (2001).

Specklinia exesilabia

(A.H. Heller & A.D.Hawkes) S.A. Solano 2002

■ **Description:** Cespitose, up to 4 cm. tall. Secondary stem is short, less than 3 mm., covered with white sheaths, scarious. Leaves are coriaceous, 1.2 cm., including the 2 mm. petiole. Inflorescence is solitary, with a filiform red peduncle that has three or four flowers and a bract. Flowers are successive, sepals and petals are green-yellowish with red longitudinal veins; lip is red-brown with a greenish base. Sepals with serrate edges, 6 mm; dorsal sepal is 1.5 mm. wide, with three carinate nerves; lateral sepals are free up to the bases, with two carinate nerves; 1.8 mm. wide. Petals are uninerved, 3 mm. Lip is 2.5 mm., hollow and inflated, round apex, with long hairs on the edges and underside, with two falcate and curved lobes on each basal side. Column is 1.9 mm., thin, with a complete apex.

Habitat: Epiphyte.

Flowering season: July.

Observations: We have not seen this species; information from Hamer (2001).

Specklinia glandulosa

(Ames) Pridgeon & M.W. Chase 2001

■ **Description:** 2 cm. tall. Secondary stem is 1 to 2 mm., covered with two scarious sheaths. Leaves are 1 to 2 cm. long, including the conduplicate 5 mm. petiole. Racemose inflorescence with 1 to 2 successive flowers, filiform peduncle, with two white scarious sheaths at the base and one in the middle. Flowers are semi-open, campanulate, sepals and petals are yellow with orange nerves and yellow lip. Floral bract is white, 1.5 mm. Sepals are acute, dorsally carinate with ciliated carinae; apical portion with ciliated edges; dorsal sepal is 5.5 mm., with a concave base; lateral sepals are connate at the base, 5 mm., forming a conspicuous chin at the foot of the column. Petals are translucent and 2.5 mm. Lip is 3 mm., strongly arched, fleshy, with a wide nail at the base and two acute lateral teeth in the lower half; the surface is densely verrucose, apical edges are round and tuberos, with three nerves, sulcate above the middle, above the nail is a small, somewhat elevated callus. Column is arched, 2 mm. long, with a 1.5 mm. Foot.

Habitat: Epiphyte in permanently green areas.

Flowering season: June.

Observations: We have not seen this species; information from Hamer (2001).

Specklinia grobyi

(Batemman ex Lindl.) Pridgeon & M.W. Chase 2001

■ **Description:** Cespitose, up to 8 cm. tall. Secondary stem is 1 to 2 cm., unifoliate, covered with a white sheath, scarious. Leaves are coriaceous, 2.7 cm., with a 7 mm. petiole, underside is purple. Peduncle is filiform, 3 cm. to the first flower, with 6 to 12 cream-yellowish flowers with red nerves. Sepals are concave; dorsal sepal is 4 mm., with three red nerves; lateral sepals are completely connate, with four nerves, 5 mm. Petals are acute, 1.5 mm. Lip is ligulate, obtuse, 1.7 mm., sulcate; disc is carinate along the lateral nerves. Column is trilobed, nailed, 2 mm., winged at the apex.

Habitat: Epiphyte in rain forest.

Flowering season: March to April.

Observations: This species is common along the San Juan River on horizontal branches.

Specklinia guanacastensis

(Ames & Schweinfurth) Pridgeon & M.W. Chase 2001

■ **Description:** Up to 12 cm. tall. Secondary stem is 2 cm., with two brown sheaths, scarious. Leaves are attenuate towards the conduplicate and 1.5 cm. petiole, retuse, with a conspicuous apicule on the sinus, carinate. Inflorescence is shorter than the leaf, 3.5 cm., unifloral. Flowers are showy, orange. Floral bract is acuminate, 2.5 mm. Dorsal sepal is acute, with three nerves, deeply carinate, 9 mm; lateral sepals are connate up to the middle, forming a conspicuous chin with the foot of the column, with three carinate nerves in the lower half of each sepal. Petals are 4 mm., oblique, spatulate, fleshy and rugose. Lip is fleshy, rugose, with round dentate apex, ciliated apical

edges, 3.5 mm., with two small translucent auricles at the base; disc with a sulcate callus that extends from the base to the apex. Column is very fleshy, 2.5 mm., with a wide 2 mm. foot, with three acuminate teeth on the winged apex.

Habitat: Epiphyte in wet forest, from sea level to 1100 m.

Flowering season: December and January.

Observations: Mainly in branches in the canopy where it forms small, inconspicuous plants.

Specklinia hastata

(Ames) Pridgeon & M.W. Chase 2001

■ **Description:** Cespitose, up to 6 cm. tall. Secondary stem is almost obsolete, unifoliate. Leaf is 2 cm., including the thin sulcate petiole, fleshy, cross-section widely triangular, obtuse at the apex with an apicule on the sinus. Inflorescence with successive flowers, with a filiform 4.5 cm. peduncle, surpassing the leaves considerably. Flowers are greenish, with red nerves, lip is wine-red, green apex. Floral bract is 0.5 mm. Sepals are lanceolate, 7.5 to 8 mm., including a fleshy and 3 mm. cauda; lateral sepals are connate near the base; dorsal sepal is trinerved. Petals elongate, with serrate edges, 3 mm. Lip with two erect lateral lobes; intermediate lobe with long hairs on the apical edges and shortly ciliated on the lateral edges, 6 mm; disc with a callus from the nail to the middle of the lip. Column is thin, arched, with erose apical edges, 3 mm., with a very short foot.

Habitat: Epiphyte in wet forest.

Flowering season: January.

Observations: We have seen this species once as a small plant on a terminal branch in the canopy.

Specklinia microphylla

(A. Rich. & Gal.) Pridgeon & M.W. Chase 2001

■ **Description:** Up to 6 cm. tall, creeping. Secondary stem is short, covered with a white and scarious sheath. Leaves are very small, tight, 6 to 10 mm., tridentate at the apex, with a very short petiole. Peduncle is filiform, with four to six yellow flowers, with reddish nerves on sepals, petals, and lip. Sepals are concave; dorsal sepal is 4.5 mm., with three red nerves; lateral sepals are connate up to the shortly bifid apex, 5.5 mm. Petals are acute, 1.8 mm. Lip is ligulate, obtuse, trinerved, 1.7 mm., shortly sulcate near the base and widely sulcate apically. Column is trilobed, nailed, 2 mm., winged at the apex.

Habitat: Epiphyte in primary rain forests and on the Atlantic plain.

Flowering season: November to January.

Observations: Forms small dense round plants, with flower stems that extend 5 cm. above the plant.

Specklinia tribuloides

(Sw.) Pridgeon & M.W. Chase 2001

■ **Description:** Up to 7 cm. tall. Secondary stem is very short, covered with white scarious sheaths. Leaf with an obtuse apex

and a small apicule on the sinus, 5 cm., attenuate towards a sulcate petiole. Racemose inflorescence, short, compact, paucifloral, with one to three flowers. Floral bract is 2 to 3 mm. Flowers are fleshy, red or brown. Sepals tuberculate on the outside which is carinate along the nerves, inside is tuberculate only on the distal half; lateral sepals are connate, forming a concave 7mm. lamina. Petals are 3 mm., dorsally carinate, with a thickened apex, rounded and with a small apicule; edges are somewhat involute. Lip is sulcate, 2.3 mm., arched, apex round. Column is thin, arched, 2 mm., with a short foot.

Habitat: Epiphyte in wet forest, from 0 to 900 m.

Flowering season: October to March.

Observations: Grows in sunny exposure where it forms small plants and colonizes the surroundings.

Specklinia yucataensis

(Ames & Schweinfurth) Pridgeon & M.W. Chase 2001

■ **Description:** up to 3 cm. tall. Secondary stem is short, covered with scarious sheaths. Leaves are 8 to 15 mm. Racemose inflorescence, up to 3 cm., with two to four flowers, with one sheath at the base of the peduncle. Floral bract is less than 1 mm. Flowers are small, light yellow. Sepals are trinerved, concave on the basal portion, dorsally carinate, curved in the apical portion, 4 mm. Petals are lanceolate, acuminate, uninerved, 3 mm. Lip is articulate to the foot of the column, erect, parallel to the column, fleshy, with reflexed edges, oblong, obtuse, 1.7 mm., above the flattened lateral lobes. Column is 1.6 mm., with a 0.6 mm. Foot, winged on the apical portion and dentate at the apex.

Habitat: Epiphyte in cloud forest.

Flowering season: December.

Observations: We have not seen this species; information from Hamer (2001).

Spiranthes graminea

Lindley 1840

■ **Description:** Erect, up to 30 cm. tall, with fasciculate roots, without leaves during the flowering season. Stem is glabrous, 25 cm., covered with glabrous sheaths, acute, 1 to 2 cm. Leaves are present, basal. Racemose inflorescence, 3 to 4 cm., multifloral. Flowers are very small, greenish with white lip. Dorsal sepal is green, pubescent exterior, with white hairs, 5 mm.; lateral sepals are oblique. Petals are 4 mm., thin, glabrous. Lip is 3.8 mm., contracted over the middle to form a sub-truncate and obtuse apical lobe with lacerated margin; lateral lobes are curved in natural position; 2 fleshy calli covered with hairs at the base, the base is fleshy, the lower half of the lip is 3 mm. wide. Column is short and thick.

Habitat: Terrestrial, in open savannah, wet areas.

Flowering season: March.

Observations: We have not seen this species; information from Hamer (2001).

Spiranthes torta

(Thurnberg) 1788

■ **Description:** Up to 30 cm. tall, erect, with fleshy roots and a linear leaf, acuminate, 10 cm., leaves generally wither during the flowering season. Floral spike is thin, with several long acuminate sheaths, densely multifloral, spiral-shaped. Floral bract is longer than the ovary, abruptly acuminate. Flowers are white-greenish. Sepals are 5 mm., somewhat pubescent on the exterior basal face; petals are connivent with the dorsal sepal, obtuse. Lip is 4 mm., shortly unguiculate, rounded at the apex, with crenulate, wavy margin; disc with two conspicuous calli at the base. Column is short, thin, with bifid rostellum.

Habitat: Terrestrial on the Atlantic plain, under pine trees and bushes in wet areas.

Flowering season: April, November.

Observations: *S. amesianaital* is a synonym. We have not seen this species; information from Hamer (2001).

Stanhopea cirrhata

Lindl. 1850

■ **Description:** With aovate pseudobulbs, up to 6 cm., with an apical leaf having seven nerves, 60 cm., including the 1.5 cm. petiole. Lateral inflorescence, with a pendant raceme generally having two flowers and a peduncle with several inflated dictic sheaths. Flowers are small for the genus, showy, white yellowish, without horns, the base of the lip is orange. Sepals are membranaceous, dorsal sepal is free, erect, concave and acute, 3 cm.; lateral sepals are reflexed, with slightly wavy margin, 3.5 cm. Lip is fleshy, divided in two parts, 3.6 cm.; the hypochile is sacciform and inflated, 1.6 cm., with two short horns, 1 cm.; epichile articulates with the hypochile apex, widely aovate, apiculate, with a slightly curved apex, 2 cm. Column is short, erect, shortly winged from the base, 2.5 cm., wings are extended on a filiform auricle, 5 mm. on either side of the anther.

Habitat: Epiphyte in undisturbed forest on the Atlantic plain.

Flowering season: August to November.

Observations: Seems to be more common in Costa Rica than in Nicaragua possibly because the undisturbed forests in Nicaragua are of difficult access. This species shows little variation in the flower.

Stanhopea costaricensis

Reichembach f. 1860

■ **Description:** Pseudobulbs are dark green, up to 5 cm., covered with long brown sheaths. Leaves with a 13 cm. petiole, lamina is 30 cm., green, acute. Pendant inflorescence, up to 8 flowers; sheaths are 3.5 cm., light green with purple patches. Flowers having light yellow sepals, petals and mesochile, the epichile is cream and the hypochile is orange, generally with two big dark brown patches at the base of the sepals and the hypochile. Sepals and petals generally have circular wine-red patches. Sepals are 6 cm., petals are 5 cm., very wavy on the margins. Lip is very fleshy, with unguiculate hypochile, with a short nectar cavity; intermediate lobe is very thick, sub-or-

bicular and with a thickened apex. The mesochile has 2 fleshy horns, white, 2 cm.; the column is short and angular on the apical two thirds.

Habitat: Epiphyte in cloud forest.

Flowering season: April to August.

Observations: The flower of this species is very variable within the same area between mountains, which has created taxonomic confusion and abundant synonyms. The main characteristic uniting this species are the leopard spots on the sepals. It has strong and pleasant fragrance often detectable at 15 m from the plant.

Stanhopea ecornuta

Lem. 1846

■ **Description:** Up to 75 cm. tall, with dark green pseudobulbs, surcate, partially covered with scarious and fibrose sheaths, up to 6 cm., short peduncle, thick, covered with four sheaths which are 2 to 4 cm. Leaves are up to 40 cm. long, with a sulcate petiole, 15 cm. and with five nerves. Pendant inflorescence from the base of the pseudobulbs, generally only with two flowers. Flowers with white cream sepals, petals and apex; lip, with few brown patches at the base of the petals and red at the base of the sepals; the horn of the lip is red-orange, with dark brown patches around the base. Column is white, with brown stripes on the anterior face. Floral bract is 6 cm. Dorsal sepal is 5 cm.; lateral sepals are 6 cm., both are concave, with acute apex. Petals are 4 cm. Lip is fleshy, simple, compressed, obtuse, the basal part is striated, 4.5 cm., with several thickenings in the interior and near the apex, the center of the disc with a smooth or excavated flattening on both sides. Column with fleshy wings, laterally angular, 3 cm.

Habitat: Epiphyte, 0-1000 m.

Flowering season: July and August on the wild, occasionally up to January in cultivation.

Observations: Leaves with five nerves instead of three which differentiates this species and *S. cirrhata* from other Nicaraguan *Stanhopea*; flower is not very variable.

Stanhopea gibbosa

Reichembach f. 1869

■ **Description:** With surcate pseudobulbs, 3-5 cm. Leaves are 25-30 cm., with wavy margin. Pendant inflorescence, up to five showy flowers and several inflated sheaths. Flowers are 4 to 6.5 cm., tricarinate, sepals and petals are white to yellow-orange, with green-yellowish marging, sepals with red nerves, reddish petals, the hypochile is white to orange yellowish, with two big dark brown patches. Column, epichile and mesochile are white with red patches. Floral bract is scarious, plicate, acute, 2.8 cm. Sepals are concave at the bases; dorsal sepal is 5 cm., with serrate apex; lateral sepals are connate at the base, 1 cm. Petals with wavy margin, acute. Lip with a 2.5 cm. hypochile; epichile is small, with revolute basal margin and obtuse auricles, 2 mm. immediately over the nail and with a fleshy and apiculate apex; the center of the disc is widely sulcate. Column is 4.8 cm., angular, with apical teeth which are 5 mm., abruptly acuminate.

Habitat: Epiphyte in cloud forest.

Flowering season: May to August.

Observations: Considered by some as a synonym of *S. costaricensis*, we have found plants with this description but with a distinctive chocolate fragrance which we consider different.

Stanhopea graveolens

Lindl. 1840

■ **Description:** With small pseudobulbs, 6 cm. long, dark green, with few flowers during the flowering season. Leaves are 40 cm., with a 12 cm. petiole. Pendant inflorescence, raceme with up to seven flowers, with inflated sheaths. Flowers are showy, white yellowish, with small red brown patches. Sepals are 6.5 cm., white yellowish with red brown patches. Petals are 5.5 cm., same color, bigger patches, wavy margin. Lip is very fleshy, complex with a largely unguiculate hypochile, with 2 white black patches, mesochile with two white horns having brown patches, epichile is white with brown patches; hypochile and the lower portion toward the column are white, the part toward the mesochile has red brown patches; the entire lip is 5 mm., besides the 90° angle between the hypochile and the mesochile. Column is 5.5 cm., basal portion is somewhat curved, the apical portion is winged, white with red brown patches.

Habitat: Epiphyte in premontane to cloud forest.

Flowering season: September.

Observations: Previously considered as a synonym of *S. oculata*, but its repugnant fetid fragrance is detectable from afar, leaving no doubt that it is a different species.

Stanhopea inodora

G. Lodd & Lindl. 1845

■ **Description:** With 3 to 5 cm. pseudobulbs, unifoliate. Leaves are 30 cm., including the 4 mm. petiole, acute and with wavy margin. It has up to seven flowers. Sepals and petals are yellow-cream with red wine patches; the lower half of the hypochile is orange with reddish spots, the rest of the lip is white with a few patches on the epichile and the bases of the horns. Dorsal sepal is 8 cm., apiculate; lateral sepals are 7.5 cm.; petals are 7 cm., wavy margin, acute. Sepals and petal may vary from pure white to stippled with red. Lip with a 3 cm. hypochile, with a circular aperture and an elongated nectar cavity without verrucosity or tubers; epichile is 3mm. Column is 6 cm., with a 2 cm. nail.

Habitat: Epiphyte in cloud forest, 1200-1300 m.

Flowering season: May to September.

Observations: Flower is not very variable, notable species for faint fragrance to humans' sense of smell.

Stanhopea oculata

(G. Lodd.) Lindl. 1832

■ **Description:** Pseudobulbs, 6 to 8 cm. long, dark green, with few leaves during the flowering season. Leaves are 40 cm., with a 12 cm. petiole. Pendant inflorescence, raceme with five

to seven flowers, inflated sheaths. Flowers are showy, white-yellowish, with small red brown patches. Sepals are 6.5 cm., white yellowish with small red brown patches. Petals are 5.5 cm., with the same color, patches are bigger, wavy margin. Lip is very fleshy, complex, with a largely unguiculate hypochile, with two dark purple patches, mesochile with two fleshy and white horns with few red brown patches; epichile is white with brown patches; hypochile with two black eyes with white halo, the portion towards the mesochile with red brown patches; the entire lip is 5 mm., besides the 90° angle between the hypochile and the mesochile. Column is 5.5 cm., the basal portion is somewhat curved, apical part is winged, white, with red brown patches.

Habitat: Epiphyte in hills.

Flowering season: September.

Observations: The white halo around the big patches on the hypochile are distinctive.

Stanhopea ruckeri

Lindl. 1843

■ **Description:** With 4 to 5 cm. pseudobulbs, surcate, dark green, unifoliate. Leaves are big, 11.5 cm., besides a 7.5 cm. petiole, elliptic and acute. Pendant inflorescence, five to seven showy flowers. Sepals are yellowish, with red patches, dark red at the base; dorsal sepal is 8 cm.; lateral sepals are 9 cm., connate, acute. Petals are 7 cm., same color as the sepals, wavy margin. Lip is white, dark red base, hypochile is yellowish with big dark brown eyes, wide. Hypochile is with a tuberculate dark brown nectary, with a wide and obovate aperture and a wide channel from the hypochile to the epichile; mesochile with two white horns having red patches and an acuminate white epichile with red patches. Column is 7 cm., with a short and 2 cm. nail, widely winged.

Habitat: Epiphyte in cloud forest, 900-1200 m.

Flowering season: August to September.

Observations: Not common in Nicaragua, distinctive because of its short hypochile and mesochile.

Stanhopea wardii

Lodd 1838

■ **Description:** With dark green pseudobulbs, 5 cm., surcate. Leaves are 30 cm., green, shortly acuminate, with a 7 cm. petiole. Pendant inflorescence, 5 to 8 flowers, floral bract is 2.5 cm. Flowers are showy, big, yellowish petals and sepals, with red patches, orange basal parts; lip: epichile is cream with few red patches, hypochile is orange, with two big red-black eyes. Lateral sepals are 4 cm. wide. Petals are acute, 5 cm., wavy on the margin. Lip is very fleshy, 2.5 cm., hypochile is 1.1 cm., mesochile is 1.4 cm. wide; nectar cavity sub-quadrate, tuberculate, 5 mm. Hypochile is angulate, dentate on each side near the base; mesochile is short, with a pair of porrect horns, curved and fleshy. Column is 5 cm., including a short and 2 cm. nail.

Habitat: Epiphyte; in wet forest, 0-1400 m.

Flowering season: August to September.

Observations: Distinctive because of its stippling on the sepals.

Stelis aemula

Schlechter 1918

■ **Description:** With soft fibrous roots. Secondary stem is 2 to 2.5 cm., unifoliate, covered with scarious sheaths. Leaf is ligulate, 5 to 6 cm., attenuate towards the 2 cm. petiole, obliquely bilobed at the apex. Inflorescence is 11 to 14 cm., solitary peduncle, with several tubular sheaths underneath the raceme; raceme is erect or arched. Flowers are green yellowish, with purple lip, floral bract is 1.5 mm. Sepals are connate with the bases, fleshy, 2 mm., trinerved, glabrous. Petals are 1 mm., sometimes less, thickened at the apices. Lip is 1 mm., very thickened, dark purple. Disc with a dilated callus on each side, transversely, contracted near the center leaving the distal half of the lip in front of the callus. Column is thick, trilobed at the apex, same length as the petals.

Habitat: Epiphyte; grows around rivers or springs in rain forest.

Flowering season: February to May.

Observations: We have not seen this species; information from Hamer (2001).

Stelis aprica

Lindl. 1836

■ **Description:** Up to 21 cm. tall. Stems are robust, up to 10 cm., partially hidden behind two tight scarious sheaths. Leaves are erect, 6 to 10 cm., including the sulcate 1.5 cm. petiole. Inflorescence is up to 11 cm., with a thin peduncle, up to 30 or more flowers which are light green to yellow-greenish, only the dorsal sepal is patent. Floral bracts are tubular, tight. Sepals are trinerved, dorsal sepal is erect and with curved margin, free portion is 3.2 mm.; lateral sepals are united at the base, deeply concave and forming a conspicuous chin; the free portion is 2.5 mm. Petals with a fleshy apex, 0.7 mm. Lip with porrect and obtuse apex; disc with a transverse bifid callus with an oval excavation in front.

Habitat: Epiphyte in wet areas.

Flowering season: January to June.

Observations: We have not seen this species; information from Hamer (2001).

Stelis argentata

Lindl. 1842

■ **Description:** Cespitose, erect, up to 25 cm. tall, with secondary 3 cm. stems, covered with two to three inflated sheaths. Leaves are 10 cm., with conduplicate 2 cm. petiole. Inflorescence is 15 cm., filiform, peduncle, loosely multifloral. Flowers are mid-sized, green to pink and purple. Sepals, papillose inside, 3 to 3.8 mm. long, same width. Petals with a truncate and thickened apex. Lip is very fleshy, minutely apiculate, 0.8 mm.; disc is thickened with a longitudinally surcate callus. Column is very short, dilated at the apex.

Habitat: Epiphyte in wet forest.

Flowering season: June to January.

Observations: *S. vulcanicola* was recently included as a synonym of this species.

Stelis carnosilabia

(Heller & Hawkes) Pridgeon & M.W. Chase 2001

■ **Description:** Cespitose, 2.5 to 12 cm. tall, secondary stem is thin and flexible, 0.7 to 4 cm. Leaves are coriaceous, 2 to 8.5 cm., including the 5 mm. petiole. Inflorescence generally has two flowers, from the base of the petiole, 2 cm., patent. Flowers are fleshy, purple with white lip. Floral bract is white, inflated, 3 mm. Sepals are 8 mm; dorsal sepal is 4 mm. wide, with three carinate dorsal nerves; lateral sepals have four nerves. Petals are translucent greenish, with three conspicuous and elevated nerves on the inside, rounded apex with curved and verrucose edges. Lip is fleshy, 6.5 mm, with erect and curved lobes on the basal part; midlobe is bigger, it has a boat shape with involute edges; disc with a verrucose callus, elevated above the nail, somewhat excavated at the base which extends almost to the apex; callus is brown reddish on the basal portion. Column is 2.5 mm, with a 1 mm. foot.

Habitat: Epiphyte in rainforest.

Flowering season: June and July.

Observations: We have not seen this species; information from Hamer (2001).

Stelis chihobensis

Ames 1923

■ **Description:** Up to 18 cm. tall. Secondary stems are robust, 4 to 6 cm., with tight brown scarious sheaths, 2.5 cm. Leaf is coriaceous, 6 to 8 cm., attenuate toward a conduplicate 1 cm. petiole. Inflorescence with two flexuose racemes, up to 11 cm., with abundant dictic flowers, peduncle is less than 5 mm., sometimes with a lower flower inside the 10 mm. basal spathe. Flowers are very small, fleshy, green yellowish, patent. Floral bract is tubular, acute, 1.5 mm., with the apical third densely ciliated, the remainder is glandular and pubescent. Petals are trinerved, with verrucose apical margin, 0.6 cm. Lip is reniform, 0.6 mm., excavated, with a transverse keel above the base, with thickened verrucose margin. Column is 0.6 mm. and nailed.

Habitat: Epiphyte in the wet tropics.

Flowering season: April to June.

Observations: We have not seen this species; information from Hamer (2001).

Stelis cleistogama

Schlechter 1918

■ **Description:** secondary stems are terete, 8 to 9 cm., unifoliate and covered with two brown 3 cm. sheaths; leaves are erect, obtuse, 8 to 9 cm., attenuate toward a short petiole. Terminal inflorescence, up to 20 cm., multifloral, forms a brown 1 cm. spathe, filiform peduncle. Floral bract is apiculate. Flowers are

small, cleistogamous, dark purple. Sepals are connate from the base one third of the way up, outside is purple, interior is covered with a white glandular-papillose mass, leaving free the purple margin. Petals are pale green with a thickened 0.75 mm. apex. Lip is 0.75 mm., pale green, with thickened apex, truncate and apiculate at the apex, with a transverse callus above the middle, excavated in front. Column is short, thick, as long as the petals.

Habitat: Epiphyte in very wet areas.

Flowering season: April and May.

Observations: We have not seen this species; information from Hamer (2001).

Stelis cobanensis

(Schlechter) Pridgeon & M.W. Chase 2001

■ **Description:** Up to 15 cm. tall. Secondary stem is unifoliate, up to 4.5 cm., covered with two to three scarious sheaths, black and carinate, 2.5 cm. Leaves are 7 cm., including the 1 cm. petiole, retuse apex, with an apicule on the sinus. Inflorescence is up to 14 cm., including the 4 cm. peduncle, raceme, paucifloral; peduncle grows from the black spathe, 1.2 cm. Flowers are light red with dark red nerves. Floral bract is acute, 3 mm. Sepals are 7.5 to 8 mm, with papillose carinae on the apex; dorsal sepal is trinerved, 3 mm. wide; lateral sepals are connate to the middles, with four nerves. Petals are 3 to 3.8 mm, with 3 nerves, rounded apex and dentate on the edges. Lip of the lower half with erect lobes, trinerved, with carinate nerves on the inside, 3.8 to 4 mm. Column is erect, thin, with 3 to 5 teeth on the apex, 2.5 mm.

Habitat: Epiphytic in wet areas.

Flowering season: unknown.

Observations: We have not seen this species; information from Hamer (2001).

Stelis conmixta

Schlechter 1918

■ **Description:** Up to 20 cm. tall, with shortened rhizome, filiform roots, with a unifoliate 8 cm. stem, covered with two sheaths. Leaves are shortly ligulate, 9 cm., with a short petiole. Racemose inflorescence, solitary, from a 1 cm. spathe, as long as the leaf. Floral bract is acuminate. Flowers are glabrous. Sepals with five nerves, connate at the bases. Petals are obtuse, fleshy, trinerved. Lip is rhomboid, with truncate base and obtuse apex, 1.2 cm., with a transverse carina and an excavation in front of the carina. Column is trilobed, dilated at the apex.

Habitat: Epiphyte in wet forest.

Flowering season: August and September

Observations: We have not seen this species; information from Hamer (2001).

Stelis convallaria

(Schlechter) Pridgeon & M.W. Chase 2001

■ **Description:** Up to 50 cm. tall. Secondary stem is 10 cm., covered with an inflated and scarious sheath that is 3 cm. at the

base and another one immediately above that is 6 cm. Leaf is coriaceous, 13 cm., sessile, dark green, surrounding the base of the peduncle. Racemose inflorescence, erect and 30 cm. Floral bract is tight and 2.5 cm. flowers are purple with white cilia. Sepals are glabrous on the exterior and with long white cilia on the interior; dorsal sepal is concave, 7 mm; lateral sepals are connate, 7 mm., adnate to the foot of the column, forming a conspicuous chin. Petals with a wide retuse apex, curved edges, 4.5 mm. wide at the apex. Lip is brown, with a pair of basal auricles; disc with three carinae, one on each lobe, the central carinae turns into an apicule between the apexes of the lateral lobes, 4 mm. Column is 5 mm., with a 2.5 cm. foot.

Habitat: Epiphyte; grows in rain forest.

Flowering season: May, irregular in other months.

Observations: Very distinct; previously classified among the *Pleurothallinae*, but DNA studies show that it is related to the *Stelis*.

Stelis crescenticola

Schlechter 1920

■ **Description:** Leaves up to 7 cm. long, including the peduncle which is 1.5 cm. long. The plant is small, up to 9 cm. tall. The inflorescence is 9 cm. long, including the 4 cm. peduncle with two to three tight sheaths. The cluster has approximately 40 flowers. The flowers have a pale green sepal and reddish glandular papillae. The petal, lip and column are brown-red. The base and the apex of the lip are white.

Habitat: Epiphyte grows in forests on low mountains.

Flowering season: December

Observations: Species reported by Hamer (2001), but we have not seen it so we took Hamer's information (1984, 2001).

Stelis cucullata

Ames 1923

■ **Description:** Up to 30 cm. tall, with a shortened rhizome. Secondary stems are 2 to 4 cm., with two tight and brown sheaths up to 2 cm. Leaves are coriaceous, attenuate gradually toward the base. Generally inflorescence is longer than the leaf, 9 cm., including the 2 cm. peduncle. Flowers are dictic, green yellowish, separated by 10 mm. intervals at the base, up to 1.5 mm. towards the apex. Floral bract is acute. Sepals are united at the bases, fleshy, trinerved, glabrous, dorsally carinate; dorsal sepal is 2.5 mm., with curved margin; lateral sepals are 2.3 mm. Petals are fleshy, trinerved, 0.8 mm. Lip is 0.5 mm., with erect margin and obtuse apex, with a bifid transverse callus at the base and a vertical and papillose keel below the callus; disc with a sub-orbicular excavation. Trilobed column.

Habitat: Epiphyte in rain forest.

Flowering season: August to January.

Observations: We have not seen this species; information from Hamer (2001).

Stelis deregularis

Barb. Rodr. 1882

■ **Description:** Cespitose, up to 25 cm. tall. Secondary stem is 8 cm., covered with two to three sheaths. Leaves are 9 cm., attenuated towards the base, short petiole. Inflorescence is 15 cm., longer than the leaf, densely multifloral almost to the base. Floral bract is 2 mm. Sepals are connate at the base, 2 to 2.5 mm, whitish yellowish. Petals are 0.7 mm, translucent, obtuse. Lip is 0.8 mm, with three longitudinal nerves. Lateral lobes are curved and very thin; intermediate lobe is truncate; disc on the basal portion with a transverse elevated callus. Column is 0.6 mm, with dentate wings on the apex.

Habitat: Epiphyte; on wet mountains.

Flowering season: June and November, but probably all year.

Observations: We have not seen this species; information from Hamer (2001).

Stelis gelida

(Lindley) Pridgeon & M.W.Chase 2001

■ **Description:** Up to 40 cm. tall, with abbreviated rhizome. Secondary stem is up to 25 cm., with two tight scarious sheaths. Leaf is erect, coriaceous, up to 20 cm., including the sulcate petiole that measures 2 to 3 cm. Axilar Inflorescence, racemose, almost as long as the leaf, up to 20 cm., with a short 2 cm. peduncle that comes out of a 1.5 cm. spathe. Flowers are 1 cm., small, campanulate, white. Floral bract is thin, inflated, 2 mm. Sepals are trinerved, concave, with long cilia in the upper half, acute, 3.7 mm. Lip is oblong, with a sub-quadrate nail at the base, 2.5 mm., erect, acute, and parallel to the column; disc with two elevated calli. Column is 2.5 mm. long.

Habitat: Epiphyte; grows in cloud forest, 1200-1500 m.

Flowering season: July to January.

Observations: Forms big mats in sunny areas where it flowers intermittently in a synchronized fashion.

Stelis glossula

Reichembach f. 1870

■ **Description:** Small plant that can measure up to 4 cm. high. The leaves are coriaceous and 2 cm. long. Inflorescence of 3.5 cm. including the peduncle that measures 2 cm. and covered by three pale-brown sheaths, it possesses less than 10 flowers. The flowers are small and have a green - cream color; the low face of the sepals has red spots. The petals are narrow and hollow; lip with a sulcate callus that is half the length of the petals or of the column.

Habitat: Epiphyte

Flowering season: June

Observations: Description based on Hamer (1984, 2001) because we have not seen this species.

Stelis gracilis

Ames 1908

■ **Description:** 12 cm. tall, unifoliate, with short stems, two to three cm. Leaf is 10 cm., obtuse, attenuate toward a short

petiole. Inflorescence has the same length as the leaf, with cumulate bracts. Flowers are small and glabrous. Sepals with somewhat curved margins; dorsal sepal is 1.9 mm.; lateral sepals are 1.6 mm. Petals are 0.8 mm., oblique, with slightly fleshy apices. Lip is 0.8 mm., reniform, obtuse, excavated at the base with two transverse fleshy calli in the center. Column is short, fleshy, trilobed.

Habitat: Epiphyte in rain forest.

Flowering season: May.

Observations: We have not seen this species; information from Hamer (2001).

Stelis guatemalensis

Schlechter 1899

■ **Description:** Up to 30 cm. tall, secondary stems are 6 to 12 cm., covered with tight brown sheaths. Leaves are coriaceous, with a tridentate apex, dorsally carinate, up to 10 cm. Inflorescence with one to two racemes from the base of the leaf petiole, longer than the leaf. Flowers are adnate to the rachis, yellow-green; the base of the sepals is brown-pink. Sepals are trinerved; dorsal sepal is 2.8 mm., sub-acute; lateral sepals are 2 mm. Forming a cup or sac with a gibbose base and with a conspicuous and thickened central nerve. Floral bract is 3 mm. Petals are fleshy, with sub-acute apex, 0.6 mm. Lip is deltoid, sub-acute, excavated, glabrous, with a conspicuous apicule. Column with five lobes.

Habitat: Epiphyte in cloud forest, 1200-1400 m.

Flowering season: May to August.

Observations: Locally common in Datanlí-El Diablo.

Stelis immersa

(Linden. & Reichenbach f.) Pridegeon & M.W.Chase 2001

■ **Description:** Up to 25 cm. tall. Secondary stem is 3 cm., covered with compressed sheaths, carinate, scarious, red-brown. Leaves are round and retuse at the apex, with an apicule on the sinus, green, fleshy, 16 cm., including the 1 cm. petiole. Racemose inflorescence, paucifloral, with up to 10 flowers, 16 cm., including the 4 to 5 cm. peduncle which is hidden to the middle inside the leaf. Flowers are yellow-ochre with brown patches at the base of the floral segments. Floral bract is 3 mm. Sepals are fleshy; dorsal sepal is 9 mm; lateral sepals are thin, sub-obtuse apex, erose, 2.5 mm. Petals 3.6 mm. spatulate, rugose, fleshy, with a wide carina. Lip hastate with thin lateral lobes with subobtus, erose apex. Column is 4 mm., with a short foot, arched, trilobed apex and dentate edges.

Habitat: Epiphyte on branches in rain forest canopy.

Flowering season: November to January.

Observations: Mainly at low altitude rain forest.

Stelis inaequalis

Ames 1923

■ **Description:** Small plant up to 6 cm. Inflorescence of 6 cm. long, including the peduncle that measures 4 cm., it pos-

sesses five sheaths from 2 to 3 mm and it is raised from a small spathe. The flowering raceme has 20 flowers split into 2 lines. The flowers are cream colored, spaced 1 mm apart. The sepal is covered with red - brown hairs, and the inside is brown. The back of the sepal possesses three carinate nerves. The petals are fleshy, wider than the lip which is 6mm long.

Habitat: Epiphyte; grows on trees and pasture or in weeds or undergrowth.

Flowering season: April

Observations: We have not found this species, information based on Hamer (1984, 2001)

Stelis longipetiolata

Ames 1922

■ **Description:** Up to 13 cm. tall. Secondary stems are 4.5 cm., covered with two brown sheaths, membranaceous, 2 to 2.5 cm. Leaves are attenuated toward a 3.5 cm. petiole, including the 8 cm. petiole, with retuse apex and a small apicule on the sinus, dorsally carinate. Solitary inflorescence, multifloral, longer than the leaves, with patent flowers that remain open day and night. Flowers with white petals and sepals, red-brown lip and column. Floral bract with curved margin, 1.5 mm., acuminate. Sepals with three prominent nerves, dorsally carinate, fleshy; dorsal sepal is 2.5 mm.; lateral sepals are 2.3 mm. Petals are extremely small, 0.6 mm., with truncate verrucose apex. Lip is 1 mm., deeply excavated and longitudinally sulcate. Column is 0.8 mm., with long lateral lobes and serrate margin between the lobes.

Habitat: Epiphyte, in wet forest.

Flowering season: May.

Observations: We have not seen this species; information from Hamer (2001).

Selis megachlamys

(Schlechter) Pupulin 2002

■ **Description:** Up to 35 cm. tall. Secondary stem is thin, covered with two somewhat inflated sheaths, carinae, red-brown. Leaves are elliptic, with retuse apex and a small apicule on the sinus, 12 cm. Racemose inflorescence, up to 25 cm., including the 5 cm. petiole that is hidden by a red-brown spathe which is 5 cm.; reddish rachis, up to 15 flowers. Flowers with red-purple sepals, petals with three red-brown stripes over a yellow-green base, ochre lip and purple column. Floral bract is inflated, brown, 5 mm. Sepals with verrucose apices, all nerves are dorsally carinate; dorsal sepal is 1.5 cm.; lateral sepals are connate up to 3 mm. from the apex, forming a bifid apex, finely ciliated edges, 15 mm. Petals are trinerved, with rounded apex that has pubescent and verrucose apical edges on the underside, 5 mm. Lip is fleshy, with big, erect and round auricles, surrounding the column, attenuate towards the center of the lip, with three conspicuous carinae underneath the lip; disc is thickened and somewhat sulcate near the base. Column is 4 mm., with a 1.5 mm. Foot, tridentate at the apex.

Habitat: Epiphyte in pine - oak forest, in variable climate, 1200-1500 m.

Flowering season: July, October, January.

Observations: Not common; all plants we have seen have 5 to 10 flowers, with two to three inflorescences.

Stelis rubens

Schlechter 1910

■ **Description:** This plant can measure up to 15 cm.; its leaves are narrow and measure 7 cm. long. This species is densely multifloral, its flowers measure 3 mm and can have a purple coloration close to the base of the sepals with the rest of the sepal being yellow green, and a few forms have dark red lip and petal. Hamer (2001) also sometimes completely green yellowish, but we have not seen these. Wide sepals and lip of rhombic shape and arched at the apex.

Habitat: Epiphytes, on tree trunks in closed and partially open forest approximately 1000 to 1500 meters above sea level.

Flowering season: July-November

Observations: Locally common, grows more often in canopy where sun light is does not reach and trunks are near the ground where the forest is more open. This species requires abundant humidity and low temperatures. It has been difficult to grow outside its natural habitat.

Stelis ovatilabia

Schlechter 1918

■ **Description:** Secondary stems are 6 to 8 mm., unifoliate. Leaves are fleshy, green, emarginate at the apex, 18 mm. Terminal inflorescence, 25 mm., raceme with 6 to 7 flowers, filiform peduncle, green to green-purple, with acuminate, purple 1.5 mm. bracts. Flowers are yellow-whitish or green-whitish, in sunlight, purple patches are visible; these flowers open little. Sepals are 1.5 mm., green yellowish to light purple, with three nerves, obtuse. Petals are 0.4 mm., yellow whitish, finely dentate, curved margin. Lip is yellow whitish, concave, 1 mm., flattened, with curved margin. Column is 1 mm., glabrous, green and with dilated apex.

Habitat: Epiphyte in wet forests.

Flowering season: Throughout the year.

Observations: We have not seen this species; information from Hamer (2001).

Stelis parvula

Lindl 1858

■ **Description:** Up to 15 cm. tall. Secondary stems are ascendant, 1 to 4 cm., covered with two brown sheaths. Leaf is elliptic, 4 cm., with a 1 to 3 cm. petiole, tridentate apex. Inflorescence is longer than the leaf, up to 8 cm., filiform, multifloral. Flowers are green yellowish, sometimes purple on the lip. Floral bract is very conspicuous, with revolute margin up to 1.5 mm. Sepals are united at the bases; petals with a thickened apex, 0.7 mm. Lip with fleshy margin and an oblong depression underneath the sulcate transverse callus. Column is 0.5 mm., trilobed.

Habitat: Epiphyte in branches covered with moss, cloud forest above 1000 m.

Flowering season: Mainly April and May.

Observations: Abundant on Mombacho Volcano.

Stelis powellii

Schletr. 1922

■ **Description:** Up to 10 cm. tall. Secondary stems are erect, 4 cm., with soft basal sheaths and a tight, brown sheath that is 1.5 cm. below the middle. Leaf is 5 cm., attenuate toward a short and narrow petiole. Inflorescence is slightly longer than the leaf, 5.5 cm., including the 1 cm. peduncle, from a 1 cm. spathe, with approximately 12 flowers. Flowers are patent, showy; sepals are green whitish, with red patches near the base; petals, lip and column are red. Floral bract is tight, acute, 2.5 mm. Sepals with five nerves, underside is pubescent, with shortly ciliate margins; dorsal sepal is 3.5 mm. wide; lateral sepals are shorter. Petals are fleshy, with fleshy and verrucose apex, 0.5 mm.; disc with a sulcate transverse callus at the base and a sub-orbicular excavation in front of the callus. Column is trilobed, short, approximately as long as the petals; anther is cordiform, purple, with white margin.

Habitat: Epiphyte in very wet areas.

Flowering season: June

Observations: We have not seen this species; information from Hamer (2001).

Stelis propinqua

Ames 1923

■ **Description:** Erect, up to 20 cm. tall, with 4 cm. stems, unifoliate and covered with a sheath. Leaf includes a short 10 cm. petiole, obtuse, coriaceous. Solitary peduncle, including the 15 cm. raceme, longer than the leaf. Raceme is thin, with approximately 15 flowers, with bracts. Flowers are fleshy. Sepals are 2 mm., with three to five nerves, sometimes on the same flower. Petals are 1 mm., with truncate apex and three nerves. Lip is 0.75 mm., rhombic, obtuse, very fleshy, with thickened margin, erect, with an apicule at the apex.

Habitat: Epiphyte in very wet areas.

Flowering season: Not reported.

Observations: We have not seen this species; information from Hamer (2001).

Stelis purpurascens

Rich & Gal 1845

■ **Description:** Up to 30 cm. tall. Secondary stems are erect, unifoliate, 5 to 10 cm., with two tight sheaths. Leaf is coriaceous, 10 cm., attenuate toward the base, with a slightly rounded apex. Racemose inflorescence, multifloral, up to 20 cm., including the 4 cm. peduncle that has two small and tight sheaths, acuminate, and a 1 cm. spathe at the base. Flowers are patent; sepals and petals are green yellowish and central segments are reddish. Floral bract is 2.2 mm. Sepals with 5 nerves which are carinate, glabrous, 2 to 3.5 and same width. Petals

are wide, with verrucose and 1 mm. apex. Lip is 1 mm., with thickened apical margin, fleshy; disc with an oblong excavation along the center. Column is short, trilobed, 1 mm.

Habitat: Epiphyte in cloud forest, 1200-1500 m.

Flowering season: June to November.

Observations: Locally abundant species in Selva Negra and the road between Selva Negra and Jinotega.

Stelis quadrifida

(Llave & Lex.) Lind. 1842

■ **Description:** With 12 cm. secondary stems and 2 long and brown sheaths. Leaves are 13 cm., green. Terminal Inflorescence, 30 cm., raceme with up to 30 flowers, grows from a 1.5 to 1.8 cm. sheath. Flowers are yellow to green-yellowish, all open at the same time. Sepals are green-yellowish, somewhat translucent; dorsal sepal is 9 to 11 mm; lateral sepals are 8 to 10 mm., connate almost to the apex, with six nerves. Petals are 8 mm., have the same color as the sepals, acute. Lip articulates with the foot of the column, yellow with a yellow-greenish central nerve, somewhat curved, with wavy edges; the basal third is fleshy. Column is 4 mm., green, with a small foot.

Habitat: Epiphyte; grows on tree trunks in rain forest.

Flowering season: December and January.

Observations: This plant is relatively large and fairly common but it is necessary to wait for it to flower to confirm the identification.

Stelis segoviensis

(Reichembach f.) Pridgeon & M.W.Chase 2001

■ **Description:** Secondary stems are 3 cm., covered with fleshy sheaths. Leaves are 4 cm., green, obtuse, emarginated at the apex. Terminal inflorescence, paucifloral raceme, with five to eight flowers, 7 cm., filiform peduncle, longer than the leaf, covered with several brown sheaths. Flowers are green-yellowish with purple patches. Sepals are 6 mm., with a dorsally carinate central nerve, green-yellowish with purple patches, somewhat papillose on the interior edges; lateral sepals are connate almost to the apices. Petals are 2.5 mm., obtuse, green-yellowish and dorsally with three longitudinal and purple stripes. Lip is somewhat curved; lateral lobes are curved; intermediate lobe is obtuse, green-yellowish with purple patches. Column with a short foot, somewhat curved, dilated towards the apex.

Habitat: Epiphyte; grows in cloud forest canopy and thick trunks of isolated trees.

Flowering season: December to June.

Observations: Locally common in Miraflores and Jinotega, forms middle-size plants that produce abundant flowering racemes in their natural habitat.

Stelis wercklei

Schlechter 1923

■ **Description:** Up to 7.5 cm. tall. Secondary stems are short, up to 4 mm., with a tiny sheath at the base. Leaves are elliptic,

up to 3 cm., including the conduplicate 6 mm. petiole, with three short acuminate teeth at the apex. Inflorescence is 7 cm., including the filiform peduncle with three small sheaths, inflated; rachis is flexuose, 1.5 cm., with three to four successive flowers. Flowers are long for the plant, wine red, generally the margin of the sepals are greenish, lateral lobes of the column are yellowish. Floral bract is thin, acute, 1 mm. Sepal surface is conspicuously glandular-pubescent with pubescent margins; the free portions of the dorsal sepal are 4 mm., those of the lateral sepals are 4 mm. Petals are 1.1 mm. lip is 1 mm., with a transverse callus at the base and a sulcate and oblong thickening in the center; the rest of the disc is deeply excavated, the margin of the lip are thickened and verrucose. Column is 1 mm., with a slightly ciliate ligula on the front.

Habitat: Epiphyte in very wet areas.

Flowering season: June to September.

Observations: We have not seen this species; information from Hamer (2001).

Stelis williamsii

Ames 1922

■ **Description:** Up to 20 cm. tall. Secondary stem is 1.5 cm., unifoliate, covered with two scarious sheaths. Leaves are coriaceous, 6 to 9 cm., including the 2 cm. petiole, dorsally carinate, retuse and apiculate. Floral scape is 10 to 20 cm., generally twice leaf length; multifloral raceme; thin rachis. Floral bract is triangular, acute; pedicel ovary is 2 mm. Flowers are purple, margin of the sepals are greenish. Sepals are glabrous, 2.2 mm., obtuse, the central nerve is dorsally carinate. Petals are 1.1 mm., truncate, with verrucose apex. Lip is triserved, 1 mm., obtuse, callose, with thickened and slightly papillose apical margin. Column is short and trilobed.

Habitat: Epiphyte in elfin cloud forest.

Flowering season: April to July.

Observations: We have not seen this species; information from Hamer (2001).

Stellilabium helleri

L.O.Wms.1962

■ **Description:** Up to 7 cm. tall. Thin stems. Leaves are acute, basal, 15 to 22 mm., those leaves on the stem are very reduced and similar to sheaths. Simple inflorescence, with two to four flowers; rachis is conspicuously bilobed, with wings that are up to 1 mm. wide. Flowers are almost sessile, successive, dark red-brown. Floral bract is obtuse. Dorsal sepal is acute, sub-orbicular in natural position, uninerved, 2 mm. Lateral sepals are acute, uninerved, 2 mm. Petals are obtuse, with retrorse cilia on the margin, 2.5 mm. Lip is sagittate, acute, without nerves, basal lobes are short, fleshy, the base of the lip in front of the column with a line of hairs, margin are retrorsely ciliate, 2.7 mm. column is fleshy, with rounded lateral lobes, each one is papillose, each hair is branched toward the apex, hairs are approximately 0.7 mm.

Habitat: Epiphyte in fallen trees and in very wet areas.

Flowering season: January.

Observations: We have not seen this species; information from Hamer (2001).

Stenorrhynchos aurantiacum

(LaLlave & Lex.) Lindl. 1840

■ **Description:** Robust, very pubescent from above the upper leaf. Stems are foliose, almost totally covered with wide inflated sheaths that surround the stem. Leaves are green, lanceolate, 6 to 20 cm. Terminal inflorescence, 12 cm., racemose, with up to 15 showy red-orange flowers. Floral bract, rachis and flowers are densely pubescent, bracts are big, 3 cm., orange to red-orange. Sepals and petals are 2 cm. Lateral sepals are involute over the middle. Petals are obtuse, curved at the apex. Lip is sessile, obtuse, sacciform on the basal portion, 2 cm., apex is obtuse and slightly verrucose, the apical portion turns downwards; disc with two thickened calli on the basal part. Column is short, rostellum is pointy, 7 to 8 mm.

Habitat: Terrestrial; grows on slopes with pines, semi-dry.

Flowering season: May to August.

Observations: Not common in Nicaragua, having fewer flowers and orange color distinguishes it from the more common *S. lanceolata*.

Stenorrhynchos lanceolata

(Aubl.) Rich. 1826

■ **Description:** Thick roots, fleshy and somewhat papillose. Leaves are absent during the flowering season, when present they are basal, acute, light green with pale green nerves, 27 cm. Floral scape is 30 to 40 cm., green or light purple, with non top and whitish hairs, on top 2.5 cm. sheaths, multifloral, with 10 to 20 flowers. Flowers are showy, 4.5 cm., including the 1 cm. petiole, white, pink, yellowish to reddish. Sepals have the same color as the flowers, 27 cm.; lateral sepals are 32 mm, connate, growing from a short chin. Petals are 25 mm, the same color as the sepals. Lip is 28 mm, lighter color than the sepals, the basal third has thickened edges, curved and with whitish hairs, central portion dilated with curved edges, the apical portion is curved with dentate edges. Column is 1 cm., white to pink, with a 6 mm. Foot, elongate rostellum.

Habitat: Terrestrial in open fields where no cattle is found, from the Atlantic slope to the sub-alpine zone in the Pacific, 0-700 m.

Flowering season: January to July.

Observations: Flower color is very variable, flowers earlier in wet areas, while in drier zones it waits for the first rains to rapidly produce the inflorescence. This can be very variable, reddish being the most common. Perennial plant with roots that survive to produce new shoots, flowers every second year.

Stenorrhynchos speciosum

(Jacq.) Spreng. 1826

■ **Description:** Up to 25 cm. Leaves are basal, up to 16 cm., including the channeled and 5 cm. petiole, acute, apiculate,

with slightly wavy margin. Inflorescence is up to 25 cm., including the robust peduncle; flowers are aggregate on a compact and 7 cm. raceme. Flowers are red, lip and column are white. Floral bract is big, 3 cm., elliptic and acute. Dorsal sepal is 1.1 cm.; lateral sepals are oblique, 1.5 cm. Petals are falcate, lanceolate, 10 mm., acute. Lip is acute, 15 mm., with lateral lobes in the middle and a sub-sacciform base with a curved auricle; disc is pilose over the isthmus between the base and the lateral lobes. Column is densely papillose on the surface, 1.2 cm., including the pointy rostellum.

Habitat: Epiphyte on trunks and thick branches; grows in cloud forest at 1200-1500 m.

Flowering season: October to February.

Observations: Always epiphytic the rachis with shorter flowers compared to those of the other members Nicaraguan *Stenorrhynchos*.

Stenotyla lendyana

(Reichembach f.)

Dressler 2005

■ **Description:** Cespitose, 25 cm. tall, pseudobulbs are small. Thin leaves 25 cm. long, surrounded at the base by imbricate sheaths with transparent edges. Inflorescence with a single flower and 15 cm. long peduncle covered with two 1 cm. long sheaths. cream-yellowish flowers. Dorsal sepal is 20 mm long, with seven nerves, lateral sepals with five nerves and 26 mm long

Habitat: Epiphyte in cloud forest above 1200m.

Flowering season: April.

Observations: We found this species a couple of times in Jinotega.

Stenotyla helleri

(Fowlie) Pupulin 2007

■ **Description:** Cespitose, 25 cm. tall, pseudobulbs are small. Thin leaves 25 cm. long, surrounded at base with imbricate sheaths with transparent edges. Inflorescence with a single flower and 15 cm. long peduncle covered with two 1 cm. long sheaths. cream-yellowish flowers with longitudinal stripes, red-violet on lip and small red spots. Callus with small brown spots. Column with dark violet stripes. Dorsal sepal is 20 mm long, with seven nerves, lateral sepals with five nerves and 26 mm long

Habitat: Epiphyte in cloud forest above 1200m.

Flowering season: April.

Observations: We have not been able to locate examples of this species. We refer to Hamer (1983).

Teuscheria pickiana

(Schlechter) 1912

■ **Description:** With piriform pseudobulbs, 3 cm., very spaced, one or two plicate leaves. Unifloral inflorescence, from

the base of the pseudobulbs, with a 3 cm. peduncle. Flowers are white, the base of the chin is pale purple, with oblique violet nerves over the lateral lobes of the lip. Floral bract is tight, 5 mm. Sepals with five main nerves; dorsal sepal is sub-acute, 1.3; lateral sepals are oblique, adnate to the foot of the column, connate and forming a conspicuous chin. Petals with five nerves, lanceolate, 1.3 cm. Outer half of the lip is trilobed, 2 cm.; lateral lobes are triangular, with rounded apices; intermediate lobe is tuberculate, 6 mm., with erose margin, pale purple; disc with three raised, orange verrucose lamina in the center, covered with orange hairs.

Habitat: Epiphyte in tropical rainy areas.

Flowering season: October.

Observations: We have not seen this species; information from Hamer (2001).

Ticoglossum krameri

(Reichembach f.) Halb. 1983

■ **Description:** with compressed pseudobulb, glabrous, sub-arched, 5 cm., covered with carinae and acuminate sheaths. Peduncle lateral to the pseudobulb. Leaves are conduplicate at the base, up to 28 cm., acuminate, with white veins. Inflorescence is erect, generally with two flowers. Flowers are patent, fleshy, white, except the nail and the callus of the lip which are yellow. Floral bract is 8 mm. Sepals are elliptic; dorsal sepal is 18 mm.; lateral sepals are 18 mm., with apiculate curved apex; petals are 15 mm., elliptic, with conspicuously obtuse and re-tuse apex. Lip with a thick nail, rigid and fleshy, 4 mm., with 2 acute lobes, triangular at the base of the intermediate lobe. Column is 8 mm., with two conspicuous auricles near the base of the cavity.

Habitat: Epiphyte in premontane forest, around 800 m.

Flowering season: September to January.

Observations: Not common and very local; the plant looks like a *Maxillaria* until the flower grows.

Ticoglossum krameri var alba

Rolfe 1894

■ **Description:** Like the nominate form except petals and sepals are white,

Habitat: Epiphyte in cloud forest.

Flowering season: September, January

Observations: A variant of the nominative form – all the specimens we have seen in Nicaragua correspond to this variant.

Trevoria glumacea

Garay 1970

■ **Description:** Up to 40 cm. tall. Pseudobulbs are oblong, unifoliate, up to 6 cm. near the base, with brown sheaths, up to 6 cm.. Leaves are plicate, lanceolate, with five carinate nerves, a 5 to 9 cm. petiole, abruptly contracted to a short acuminate apex; blade up to 38 cm.. Inflorescence is pendant, elongate,

with three to six flowers, with a 5 to 10 cm. peduncle, two to three inflated and acuminate 5 cm. sheaths. Flowers are inverted, with green-creamy sepals, lip and column are white, callus is yellow. Floral bract is similar to the peduncle sheaths. Sepals with seven nerves, acute; dorsal sepal is 1.5 cm., concave; lateral sepals are oblique, fused halfway up; bases of the lateral sepals forming a wide, conspicuous chin. Petals are acuminate with three nerves. Lip is erect and parallel to the column, fleshy, adnate to the foot of the column, fleshy base and cuculla-shaped, epichile is fleshy and conduplicate on the distal half, united to the hypochile by a wide isthmus; the entire lip is 14 mm.; basal depression has three short raised carinae in its interior ending in a plate with a thickened apex that extends over the nail of the epichile. Column is short, 4 mm., with a short foot and a short serrate tongue.

Habitat: Epiphyte in moss covered trees in cloud forest.

Flowering season: July.

Observations: All *Trevorias* are rare and more sensitive to the environment than other *Stanhopiniidae*.

Trevoria zahlbruckneriana

(Schlechter) Garay 1970

■ **Description:** Up to 25 cm. tall. Pseudobulbs are cylindrical, slightly compressed, 4.5 cm., attenuate toward the apex, unifoliate, covered with two scarious sheaths, brown. Leaves with 5 nerves, abruptly attenuate toward a short and acuminate apex, up to 20 cm., with a conduplicate and 4 cm. petiole. Inflorescence is short, pendant, racemose, 10 cm., with two or three flowers on a flexuose and 2 to 3 mm. wide peduncle. Flowers are campanulate, cream-whitish, disc and anther are orange-yellowish. Bract is acute, 2 cm. Sepals are concave, 1.8 cm.; dorsal sepal is abruptly contracted forming an apicle the lateral sepals are connate for one third of their length, with acute and falcate apex, 1.2 cm. wide. Petals are erect, acute, 16 mm. Lip is adnate to the foot of the column, fleshy, 8 mm. at the base, epichile is sub-orbicular, with erose margin and contracted to form a sub-acuminate and fleshy apicle, 9 mm., with erect margin; the entire lip is 17 mm.

Habitat: Epiphyte in cloud forest.

Flowering season: July.

Observations: We observed a 6 cm. Flower shoot in February on a plant that appeared to be this species, but it was aborted before the flower opened.

Trichopilia galeottiana

Rich. 1845

■ **Description:** Unifoliate pseudobulbs, 7 cm., compressed, green to green yellowish, covered with brown spotted sheaths. Leaves are terminal, 14 cm., green, dorsally carinate. Inflorescence is lateral, patent or pendant, unifloral, sometimes with a raceme having two to three flowers. Flowers are showy, green yellowish, with brown or purple patches and a white lip. Sepals are not twisted, smooth margin, green yellowish; dorsal sepal is 5 cm.; lateral sepals are 6 cm., connate at the bases, dorsally

carinate, acuminate. Petals are 5 cm., not twisted, same color as the sepals. Lip surrounding the column with the basal portion, when flattened it is 5.5 cm.; intermediate lobe is bilobed, dilated and recurved, with wavy margin; yellow on the inside, lower half is yellow, upper half with orange to reddish patches; disc on the lower half with two conspicuous hollows. Column is 2 cm., green and white.

Habitat: Epiphyte on mountains in closed forest understory near the base of trunks.

Flowering season: February to August.

Observations: We have seen only one Nicaraguan specimen of this taxon.

Trichopilia marginata

Henfr. 1851

■ **Description:** Up to 35 cm. tall, with short rhizome. Pseudobulbs are compressed, 7 to 13 cm., occasionally twisted, covered one third of their length with brown maculate sheaths. Leaves are carinate, 20 cm., gradually attenuate toward a conduplicate 1 cm. petiole. Inflorescence with a single flower which is up to 10 cm., occasionally with two arched peduncles from the base of the pseudobulb; peduncle is 3 to 5 cm., partially hidden by two or three maculate sheaths, 1 to 1.5 cm. Flowers with green yellowish sepals and petals, lip is pale yellow or white with an orange-yellow center and sometimes with red patches in the throat and on the intermediate lobes. Floral bract is 15 mm., acute and maculate. Sepals with wavy margin, carinae; dorsal sepal is up to 5 cm.; lateral sepals are oblique, up to 5 cm. Petals are oblique, usually with a red central nerve. Lip is big, trilobed, 5 cm., across the flattened lateral lobes; intermediate lobe is deeply retuse, 1 to 1.5 cm.; disc bifurcates at the basal portion. Column is thin, with three lacerated lobes at the apex, rear lobe is longer than the lateral lobes.

Habitat: Epiphyte; grows shaded in closed cloud forest.

Flowering season: May to July.

Observations: We have found some plants that can be this species or can be alba forms of *T. tortilis*. We illustrate the nominate form from Costa Rica which we have not seen in Nicaragua.

Trichopilia tortilis

Lindl. 1836

■ **Description:** Unifoliate pseudobulbs, 7 cm., compressed, green to green yellowish, covered with brown sheaths and patches. Leaves are terminal, 14 cm., green, dorsally carinate. Inflorescence is lateral, patent or pendant, unifloral, sometimes with a raceme having two to three flowers. Flowers are showy, green yellowish, with brown or purple patches and a white lip. Sepals are very twisted, wavy margin, green yellowish, purple along the midline; dorsal sepal is 5.5 cm.; lateral sepals are 6.5 cm., connate at the bases, dorsally carinate, acuminate. Petals are 5.5 cm., very twisted, same color as the sepals. Lip surrounding the column with the basal portion, when flattened it is 5.5 cm.; midlobe is emarginate and bilobed, dilated and

curved, with wavy margin; white on the inside, lower half is white yellowish with orange to reddish patches; disc on the lower half with two conspicuous hollows. Column is 2 cm., green and white, on the trilobed apex.

Habitat: Epiphyte on mountains in closed forest near the base of trunks.

Flowering season: February to August.

Observations: This is the most common Nicaraguan *Trichopila*, but it is still limited to relatively pristine forests.

Trichopilia turrialvae

Reichembach f. 1863

■ **Description:** up to 25 cm. tall. Pseudobulbs are erect, compressed, up to 12 cm., covered with scarious sheaths with brown patches. Leaves are acute and sulcate, up to 15 cm. Flowers are solitary, showy, sepals and petals are pale yellow; lip is white with a yellow throat. Floral bract is 1.5 cm., acute, membranaceous, pedicel ovary is 3 cm. Sepals are slightly twisted, 4 cm., with a green central vein; dorsal sepal is less wide than the lateral sepals which are united from the base to the middle. Petals with wavy margin, without twisting, 4 cm., acute. Tubular lip, intermediate lobe is retuse on the apex, lateral lobes are reflexed and wavy; disc with an elongated central carina with two depressions on the basal portion.

Habitat: Epiphyte in cloud forest.

Flowering season: January.

Observations: We have not seen this species in Nicaragua, so we include images of the nominate Costa Rican form.

Trichosalpinx blaisdellii

(S.Watts)

Luer 1983

■ **Description:** With a secondary stem that is up to 6 cm., with dilated and ciliate sheaths at the apices. Leaf is marginate, up to 42 mm., coriaceous, top is green with some purple, underside is purple, tridentate at the apex. Inflorescence is terminal, underneath and shorter than the leaf, raceme with three to six flowers, purple peduncle and brown sheaths. Flowers are yellow whitish with purple patches, 5 mm. Sepals are whitish, translucent with purple, ciliate margin; dorsal sepal is 3.5 mm.; lateral sepals are connate up to the apices, 3.5 mm., dorsally with two conspicuous carinae. Petals are 2 mm., translucent with a little purple, margin are more or less fimbriate. Lip is 2.5 mm., somewhat curved, dark purple, lateral margins are curved and ciliate, with two auricles at the base. Column is 1.5 mm., whitish translucent, with a 1 mm. foot, purple, with two dentate wings at the apex.

Habitat: Epiphyte in cloud forest.

Flowering season: June to March.

Observations: Locally common, recognizable by its purple flowers underneath the leaf.

Trichosalpinx cedralensis

(Ames) Luer 1983

■ **Description:** Up to 10 cm. tall. Secondary stems are rigid, covered with brown sheaths, dilated and apiculate, with several leaves distributed along the stem. Leaves are 13 mm., obtuse, fleshy, dark green; underside with three purple nerves and purple margin. Inflorescence from the base of the leaf, 2.4 cm., peduncle is filiform, green, covered with wide brown sheaths, racemose, with six to eight flowers. Flowers are green yellowish, patent, with pedicel ovary, filiform, 4 mm. Sepals are 4 mm., attenuate from the middle to the apex. Sepals are dorsally tricarinate to the middle, uninerved portion; lateral sepals are uninerved; nerves are raised and wide. Lip is 2.2 mm., fleshy intermediate lobe, terete and finely verrucose; lateral lobes are raised, outside is slightly verrucose; between the lateral lobes there is raised callus; intermediate lobe on the basal position with an excavation. Column is thin with a short foot.

Habitat: Epiphyte in tall trees in the cloud forest.

Flowering season: July and December.

Observations: Even though we have found the plant several times, we have not seen it in flower.

Trichosalpinx dura

(Lindley) Luer 1983

■ **Description:** Patent or pendant, up to 15 cm. long. Secondary stems are thin, one to six leaves, covered with sheaths, often branched. Leaves are 0.8 to 2 cm., underside sometimes has three purple nerves. Inflorescence from the leaf base, up to 6 cm., including the 3 cm. peduncle, generally with four to six flowers. Floral bract is 1 mm., acuminate. Flowers are patent, cream-greenish, with a dark ochre callus. Dorsal sepal is concave, acuminate, 4.5 mm., with three nerves on the underside; lateral sepals with 1 carinae dorsal nerve, 4.8 mm. Petals are thin, 1.6 mm., oblique. Lip is fleshy, arched, 2 mm., with an obtuse apex; disc with two lateral calli that unite above the base and underneath the apex; between the calli is a sulcate and verrucose depression; the entire lip has pubescent edges. Column is 1.5 mm. long, with a short foot, widely winged on the superior portion.

Habitat: Epiphyte in cloud forest.

Flowering season: April to July.

Observations: We have not seen this species; information from Hamer (2001).

Trichosalpinx foliata

Griseb. 1864

■ **Description:** 15 cm. tall. Secondary stems are thin, with 1 to 6 leaves, covered with sheaths, normally branched. Leaves are 0.8 cm., underside sometimes has three purple nerves. Inflorescence of the leaf base, up to 6 cm., including the 3 cm. peduncle, paucifloral generally with four to six flowers. Floral bract is 1 mm., acuminate. Flowers are patent, cream-greenish, with a dark ochre callus. Dorsal sepal is concave, acuminate, 4.5 mm., with three nerves on the underside; lateral sepals with a carinate dorsal nerve, 4.8 mm. Petals are thin and 1.6 mm.

Lip is fleshy, arched, 2 mm., with obtuse apex; disc with two lateral calli that join at the base and underneath the apex; between the calli is a sulcate verrucose depression, the entire lip has a pubescent margin. Column is 1.5 mm., with a short foot, widely winged.

Habitat: Epiphyte in cloud forest.

Flowering season: April to July.

Observations: We have not seen this species; information from Hamer (2001).

Trichosalpinx memor

Reichembach 1856

■ **Description:** Up to 9 cm. tall. Secondary stem is thin, covered with several sheaths. Leaves are coriaceous, convex, 1.7 to 3 cm., with retuse apex and an apicule in the center. fasciculate Inflorescence, 1.5 cm., with two to three flowers on each raceme, with a short peduncle. Flowers are fleshy, with red sepals, white petals, yellow lip with red lateral stripes and anther. Floral bract is 1.5 mm., pedicel ovary is arched, 3 mm., red violet. Sepals are fleshy, exterior is finely rugose, curved and conspicuously ciliate margin; dorsal sepal is 3 mm.; lateral sepals are connate up to the middle, 3.5 mm., with a small chin at the base. Petals are thin, translucent, truncate apex, dentate, 1.9 mm. Lip is oblong, panduriform, due to the ciliate lobes on the lower half, the rest of the margin are finely papillose, 2.5 mm., shortly unguiculate, with 2 auricles at the base. Column is 2.5 mm., with a short foot and a tridentate apex.

Habitat: Epiphyte or terrestrial in very wet areas.

Flowering season: September to December.

Observations: There are substantive populations on meadows of Mombacho Volcano, though these are inconspicuous around *Sobralia* roots.

Trichosalpinx orbicularis

(Lindley) Luer 1983

■ **Description:** A 3 to 5 cm. secondary stem, covered with a sheath and ciliate on the margin. Leaves are orbicular to widely elliptical, 2 to 3 cm., tridentate at the apex. Inflorescence generally has two flowers, purple, very short, on the top of the leaf. Floral bract is 2 mm. Sepals with glabrous margin, purple, apical portion is yellowish; dorsal sepal is concave on the basal portion, trinerved, 6 mm.; lateral sepals are connate around the basal chin which is 7 mm. Petals are red, with yellowish apices, 2.5 mm., with acuminate and finely dentate apex. Lip is trinerved, attenuate toward the apex, 3 mm., shortly unguiculate with auricles on each basal side, ciliate on the margin but not on the basal portion; disc with three inconspicuously raised nerves. Column is erect, trilobed at the apex, 2 mm., with a 1 mm. foot.

Habitat: Epiphyte in rain forest.

Flowering season: February and September.

Observations: We have not seen this species; information from Hamer (2001).

■ **Description:** Up to 60 cm. tall. Pseudobulbs are compressed, deeply sulcate and carinate, green yellowish, up to 6 cm. Leaves are attenuate toward a conduplicate 10 cm. petiole. Flowers are tubular-campanulate, pale brown, with brown green nerves, lip with white lateral lobes and purple nerves, intermediate lobe is green; petals with a thickened dark brown patch at the apex. Floral bract is 3 cm. Sepals are spatulate, with seven nerves, acute; dorsal sepal is 3.8 cm., unguiculate, lateral margin of the distal half are curved; lateral sepals are 3.2 cm., oblique, with distal half reflexed. Petals with five nerves, with fleshy curved apex, 2 cm. Lip is trilobed, sub-erect, 9 mm. over the lateral lobes; lateral lobes are thin, surrounding the column; intermediate lobe is verrucose and very fleshy. Column is arched, 5.5 mm., with verrucose anterior margin.

Habitat: Epiphyte, in rain forest to premontane forest 0 to 800 m.

Flowering season: Almost constantly from January to October.

Observations: flower and plant appearance almost identical to *T. seemanni*, pseudobulb is rounder and it is smaller than this one.

Trigonidium seemanni

Reichembach f. 1854

■ **Description:** With short creeping rhizome. Pseudobulbs are laterally compressed, 2.5 to 3 cm. Leaves are basally conduplicate on the basal portion, 30 to 35 cm. Inflorescence from the base of the pseudobulbs, erect, unifloral; peduncle is 18 cm., covered with tight sheaths. Flowers are erect, tubular-campanulate, yellow greenish with purple veins. Sepals are spatulate; dorsal sepal is acute, largely unguiculate, 3 cm.; lateral sepals are 3.1 cm., curved in the distal half, acuminate. Petals are 1.5 cm., erect, translucent with purple stripes and a white thickening with purple margin at the apex. Lip is yellowish with purple stripes on the lateral lobes; intermediate lobe is yellow greenish with a strongly curved distal half; lateral lobes are erect, short; disc with a linear callus in the lower half; the entire lip is 7 mm. Column is semi-terete, erect and 5 mm.

Habitat: Epiphyte in tall trees wet habitat.

Flowering season: September.

Observations: Almost identical to *T. egertonianum* but with more quadrate pseudobulbs and we have found it at 700 m. and above.

Tropidia polystachya

(Sw.) Ames 1922

■ **Description:** Foliose, somewhat branched. Leaves are membranaceous, dictic, only on the apical portions of the stem, acute to largely acuminate, 3 to 16 cm. Terminal inflorescence, multifloral; peduncle is thin 6 cm. Flowers are greenish-whitish to reddish, with an 8 mm. pedicel ovary and a 6 cm. Floral bract, conspicuous central nerve. Dorsal sepal is acute, concave, 4 to 5 mm.; lateral sepals are oblique, thickened at the base, 5 mm. Petals are truncate to sub-acute at the apex, 5 mm. Lip is 5 mm., concave, with involute margin, contracted in

the basal region, apical portion is thinner and with a retuse to inconspicuously trilobed apex, a very thick and sacciform base, disc is somewhat pubescent on the central portion, with two intramarginal carinae that converge near the apex. Column is 3.5 mm.

Habitat: Terrestrial; grows in well drained open fields and forest edges.

Flowering season: October and November.

Observations: Very local with deep tap roots, even though the plant is 10 to 15 cm. above the surface. Roots can go down 30 cm.

Vanilla helleri

Hawkes 1966

■ **Description:** Elongate, flexuose, with sub-quadrate stems, sulcate on both sides, dark olive green. Leaves are fleshy, contracted toward an acuminate and 1 cm. apex and toward a sulcate 1 cm. petiole, alternate every 12 to 14 cm. Inflorescence is 10 cm., including a peduncle with up to 20 flowers. Flowers are small for the genus, semi-patent, 6 cm. diameter; sepals are whitish, underside of the distal half is greenish, lip is intense yellow, with orange appendages on the midlobe; white column. Floral bract is acute, dark green, 7 mm. Sepals are 4 cm., slightly concave; dorsal sepal is 14 mm. wide; lateral sepals are oblique, sub-obtuse, 14 mm. wide. Petals are 4 cm., obtuse, with three thick carinate nerves on both sides. Lip is trilobed, 4 cm., over the flattened lateral lobes; midlobe is densely covered with elongated and retrorse appendages; lateral lobes with complete margin and conspicuous nerves; lip is adnate to the base of the column; disc on the basal portion with dense tubercles that fuse into a slightly raised callus forming a crest. Center of the lip. Column is sub-nailed, with fine glandular hairs immediately underneath the stigma.

Habitat: Epiphytic, creeping; on tree trunks.

Flowering season: April.

Observations: Even though we have found several plants that more or less correspond to this description, none have flowered, so we have not confirmed its identification.

Vanilla inodora

Schiede 1829

■ **Description:** With exposed roots on the leaf axils, stems are thin, with alternating leaves. Leaves are fleshy, coriaceous, acuminate, with an abruptly reflexed apex, up to 14 cm. Inflorescence is axilar, with short peduncle and four to six successive flowers. Flowers with green petals and sepals, ochre lip, with orange yellowish nerves and a yellowish column. Floral bract is obovate, 5 mm. Pedicel ovary is 2.5 cm. Sepals are obovate, wide with rounded apex; dorsal sepal is 4 cm. lateral sepals are 4 cm., slightly oblique. Petals are sub-obtuse, gradually attenuate toward a thin nail, oblanceolate, uninerved, slightly carinate, 4 cm. Lip is 5 cm. when flattened, joined to the column up to the middle, forming a cuneiform tube when flattened and slightly trilobed near the apex, with wavy apical edge; disc with a big and sub-quadrate crest above the middle, with ser-

rate lamina on the upper margin. Column is thin, 3.3 cm., densely glandular on the anterior surface.

Habitat: Epiphyte in rain forest.

Flowering season: July.

Observations: More common than *V. odorata* which is somewhat similar, but the apex of the leaf is reflexed in *V. inodora*. Curiously, it does not flower while it is creeping but when it detaches and hangs loose.

Vanilla odorata

Presl. 1830

■ **Description:** With exposed roots on the leaf axils, stems are 1 cm. and leaves are alternate and very short. Leaves are fleshy, coriaceous, acuminate, with a barely reflexed apex, up to 16 cm. Inflorescence is axilar, with short peduncle and four to six successive flowers. Flowers with yellowish green petals and sepals, ochre lip, with orange yellowish nerves and an ochre yellowish column. Floral bract is obovate, 5 mm. Pedicel ovary is 2.5 cm. Sepals are oblanceolate, sub-acute, gradually attenuate towards a short nail, slightly concave, with sub-acute apex; dorsal sepal is 5.4 cm.; lateral sepals are 5 cm., slightly oblique. Petals are sub-obtuse, gradually attenuate toward a thin nail, oblanceolate, uninerved, slightly carinate, 5 cm. Lip is 4.3 cm. when flattened, joined to the column up to the middle, forming a cuneiform tube when flattened and slightly trilobed near the apex, with shortly fimbriate apical edge; disc with a big and sub-quadrate crest above the middle, with serrate lamina on the upper margin. Column is thin, 3.3 cm., densely glandular on the anterior surface.

Habitat: Climbing epiphyte in tropical rain forest.

Flowering season: July, December.

Observations: Less common than *V. inodora* which is somewhat similar, but the apex of the leaf is not reflexed. It does not flower while it is climbing but when it detaches and is pendulous.

Vanilla planifolia

G. Jackson 1808

■ **Description:** Creeping, foliose, with roots on the nodes. Stem is fleshy, flexuose, with fleshy leaves, ovate-elliptic, acute to sub-acuminate, up to 20 cm. Inflorescence from the axils of the leaves, racemose, with several flowers. Floral bract is up to 7 mm. long. Flowers are successive, yellow-greenish, wide open, showy; sepals are fleshy, linear-oblanceolate, acute, up to 6 cm. Petals are similar but with a conspicuously carinate central nerve, 5 cm. Lip is unguiculate, tubular in natural position, basal nail is adnate along the column, finely pubescent inside; free portion is cuneiform, truncate and emarginate at the apex; disc is longitudinally verrucose and with retrorse and dentate lamella; the entire lip is 4.5 cm. Column is thin, pubescent on the anterior face, 3.2 cm.

Habitat: Creeping epiphyte on tropical forest trees, 0-200 m.

Flowering season: Irregularly, July to December.

Observations: Habitat is similar to *V. pompona*, leaves are less fleshy and needs more shade in our experience.

Vanilla pompona

Scheide 1829

■ **Description:** Climbing, stems are thick and foliose, up to 2 cm. diameter, widely oblong, fleshy-coriaceous, up to 25 cm., with curved margin, abruptly contracted toward a sub-obtuse apex, with conduplicate 1 cm. wide petiole. Axilar inflorescence, with up to 10 successive flowers. Floral bract is coriaceous, acute, 7 mm. Pedicel ovary is 3 cm., arched, triangular in cross section. Flowers are big, petals and sepals are pale yellow, lip is yellow orange, column is pale yellow with an orange front. Sepals are shortly oblanceolate, obtuse, with involute margin, up to 9 cm., unguiculate; lateral sepals are oblique. Petals are linear-oblanceolate, as long as the sepals, 1.5 cm. wide, with a wide and fleshy dorsal carinae. Lip is adnate to the column up to the rostellum base, forming a tube, curved, with serrate and curved apex, cuneiform when flattened, deeply retuse, 5 cm.; disc with two carinae and ciliate nerves on the basal portion ending in a quadrate bulb withfimbriate hairs, retrorse, followed by raised lamina to the apex of the lip; throat with cilia on each side of the two basal carinae. Column is thin, 7 cm., triangular in section, densely ciliate on the anterior face between the middle and the stigma.

Habitat: Creeping epiphyte in rain forest and premontane forest, 0-500 m.

Flowering season: February to April.

Observations: Even though we did not find it common in forests, it prospers in cultivation from pieces of vine planted next to trees, and is the most common species in cultivation.

Warrea costaricensis

Schlechter 1920

■ **Description:** Erect, up to 80 cm. tall, with elongated pseudobulbs, inconspicuous, unifoliate. Leaves are 65 cm., including the conduplicate petiole that surrounds the peduncle, Acute and with very pronounced nerves. Inflorescence is erect, racemose, approximately as long as the leaves, growing from a sheathed petiole on the leaf. Flowers are relatively long, showy, with wine red sepals on the outside, pale yellow on the interior; petals are yellowish with red patches; lip is white on the basal portion, dark red in the center, with yellow margin and white callus. Dorsal sepals and petals are 4 cm.; lateral sepals are 4.5 cm.; sepals and petals are obtuse, concave; lateral sepals are oblique, forming a chin with the foot of the column. Entire lip is 4 cm., sub-orbicular when flattened, lower half is slightly curved, distal half with verrucose and conspicuous nerves, retuse apex; disc with an raised callus, with triangular shape from the base to almost the middle of the lip. Column is thin, 2.6 cm., with a short foot.

Habitat: Terrestrial; grows in shade in rain forest.

Flowering season: We found flowers in February, April, August and November.

Observations: We have not found this species in the Nicaraguan Atlantic slope, it does not flower every year.

Xylobium elongatum

(Lindl. & Paxton) Hemsl. 1885

■ **Description:** Up to 40 cm. long. Lateral Inflorescence racemose with 10 to 15 flowers, white; lateral sepals are slightly purple at the apex, lip is yellowish with red patches and column has red stripes. Floral bract is linear-attenuate, 10 mm. long; pedicel ovary with the same length. Sepals are acuminate with curved margin; dorsal sepal is slightly contracted near the middle; lateral sepals are triangular forming a conspicuous chin over the middle with erect lateral lobes over the flattened lateral lobes, red nerves, papillose on the interior and exterior face; intermediate lobe is conduplicate, fleshy; disc with a tricarinate callus from the base to the middle. Column is 2 cm., including the foot of the column, very pronounced, 10 cm. long.

Habitat: Epiphyte in trees trunks and terrestrial in cloud forest.

Flowering season: May to October.

Observations: The most common *Xylobium* on mountains from 1000 m. above, as long as the forest is not very intervened.

Xylobium foveatum

(Lindley) G. Nicholson 1887

■ **Description:** Up to 40 cm. tall. With multifloral inflorescence of raceme. Flowers are patent, cream-yellowish, with yellow-orange nerves over the lip. Sepals are fleshy, acute; laterals are oblique and connate to form a conspicuous chin with the foot of the column. Petals are oblique, acuminate. Lip is parallel to the column; lateral lobes are erect, obtuse and elliptic. Intermediate lobe is sub-orbicular, very fleshy, with slightly curved margin and a fleshy keel underneath the apex; disc with a tricarinate callus, linear from the base to the middle. Column is robust, with a thin foot, 4 mm. long.

Habitat: Epiphyte in wet tropical forest.

Flowering season: August to October.

Observations: Pseudobulbs and leaves are similar to *Stanhopea* or *Góngora*, in relatively undisturbed forest on the Atlantic slope.

Xylobium pallidiflorum

(Hook.) G. Nicholson 1887

■ **Description:** Cespitose, up to 40 cm. tall. Pseudobulbs are shortly obovate-cylindrical, gradually attenuate toward a neck with three basal sheaths. Leaves are oblanceolate, including the sulcate and twisted petiole, 10 cm. long, with five dorsally carinate nerves. Inflorescence is 20 cm., with three to five flowers, spaced approximately every 1.2 cm. Flowers are white to creamy, except for the base which is yellow or orange on the lip. Petals with five nerves, obliquely oblanceolate, sub-acute. Lip is more or less elliptic, slightly trilobed past the middle; disc

with five raised nerves from the base to the intermediate lobe; the entire disc is slightly concave past the middle; intermediate lobe is verrucose, with a papillose thickening on the lower half. Column is robust, arched, with a thin foot, 4 mm. long.

Habitat: Epiphyte in cloudy areas, 1000 m. and above.

Flowering season: all year.

Observations: Small plant, with cylindrical pseudobulbs, less conspicuous than the other species previously mentioned.

Xylobium sulfurinum

(Lindley) Lindl. 1918

■ **Description:** Erect, with bifoliate pseudobulbs, 5 to 6 cm., surrounded with imbricate fibrose sheaths. Leaves are largely petiolate, petiole is 15 cm., plicate, 30 cm. Inflorescence is erect, racemose, 16 to 18 cm., basal portions are surrounded by inflated and 3 cm. sheaths. Flowers are creamy-yellowish, with a 2 cm. Floral bract. Sepals are patent; dorsal sepal is acute; lateral sepals are oblique, adnate to the foot of the column, forming a conspicuous chin; sepals are 15 mm. long, width at the base 5 mm. Petals are 13 mm. Lip is complete to darkly trilobed on the apical third, articulate with the foot of the column, 11 mm., with somewhat curved margin, apical portion is slightly concave; disc with several parallel nerves, the three central ones are slightly raised in the center. Column is short, with an elongate foot.

Habitat: Epiphyte in cloud forest.

Flowering season: February to April.

Observations: We have not seen this species; information from Hamer (2001).

Zootrophion endresianus

(Kraenzl.) Luer 1982

■ **Description:** patent and erect with secondary stems that measure 3 to 7 cm., covered with four pergamine sheaths with reflexed edges. Short peduncle, up to 2 mm long, with long, brown sheaths, measures 5 mm at the base. 6 to 8 cm. long coriaceous leaves with 4 prominent carinae, retuse and tridentate apex. Inflorescence in cluster with one to three flowers that grow from beneath the leaf petiole. fleshy, cream-white with red spots flowers; yellow-cream colored lip, yellow petals, sepals with conspicuous carinae, dorsal sepal is 2.7 cm. long and lateral sepals are 2.6 cm. long, strongly convex with reflexed edges. Floral bracts are 5 to 7 mm long, lip erect and with two protruding teeth, disc with an elevated, warty and orbicular callus between the center and the base of the lip. Column is 3 mm long, pulled with half the upper portion free. Capsule is 2.5 cm. long with 11 nerves or papillose carinae.

Habitat: Epiphyte; grows on cloudy and moist mountains, 1200 m above sea level

Flowering season: July to October

Observations: flower cleistogamors and rarely opens; not very common.

Zootrophion gracilentus

(Reichembach) Luer 1982

■ **Description:** Patent and erect with secondary stems that measure 3 to 7 cm., covered with pergaminate sheaths with reflexed edges. Short peduncle, up to 2 mm long, with long, brown sheaths, measures 5 mm at the base. 6 to 8 cm. long coriaceous leaves. Inflorescence in cluster with one to three flowers that grow from beneath the leaf petiole. fleshy, cleistogamous cream-white with red spotted flowers; white lip, white petals, sepals with conspicuous carinae, dorsal sepal is 2.3 cm. long and lateral sepals are 2.2 cm. long, strongly convex with reflexed edges. Floral bracts are 5 to 7 mm long, lip erect and with two protruding teeth. Column is 3 mm, long, pulled with half the upper portion free. Capsule is 2.5 cm. long with 11 nerves or papillose carinae.

Habitat: Epiphyte; grows in cloud forest, 1200 m. above sea level

Flowering season: July to October

Observations: Flower pollinates itself and rarely opens; not common.

Zootrophion moorei

(Rolfe) Luer 1982

■ **Description:** Up to 6 cm., very short secondary stem, up to 1 cm., covered with several white sheaths that disintegrate. Orbicular-elliptic leaves with 3.5 cm. long lamina, abruptly contracting to the 1 cm. long petiole; leaves are green on top and purple below. Fasciculate Inflorescence with two to three dark-red flowers. Sepals generally joined at the base and the apex, leaving an aperture between the lateral and dorsal sepals; dorsal sepal has seven warty nerves, 14 mm long; lateral sepal is connate to the apex, 15 mm long; the underside is surcate while the top has warty edges. Lip is 4.2 mm long, all warty; column is short and erect, with a 2 mm long foot.

Habitat: Epiphyte; in mountains.

Flowering season: July

Observations: We have only seen this species growing at the Lankester gardens, Costa Rica.

BIBLIOGRAPHY

- Adams, B.R. 1993. A taxonomic revision of the genus *Scaphyglottis* Poeppig & Endl. (Orchidaceae- Edendriolidae) PhD thesis Southern Illinois University, Carbondale. Illinois.
- Alcock, John 2006. An enthusiasm for Orchids: Sex and deception in Plant evolution. Oxford U. Press, U.K. 299pp.
- Andrews, J, and E. Gutierrez 1988. Un listado Preliminar de las Orquídeas de la Península de Yucatán. Orquídea (Méx.) 11: 103-130.
- Anonymous, 2003. Codigos y Nombres de las Planta, Ordenado Alfabéticamente, Asociación Costarricense de Orquídeología 58pp.
- Archila, F. 2001. *Lepanthes* de Guatemala. Secretaria Nacional de Ciencias y Tecnología de Guatemala.
- Arditti, Joseph 1992. The Fundamentals of Orchid Biology. Wiley and Sons, New York 691 pp.
- Arditti, Joseph, and Robert Frost. 1992. Micropropagation of Orchids. Wiley and Sons. New York 62 pp.
- Atwood, John 1984. A Floristic Study of Volcan Mombacho, Dept of Granada, Nicaragua Ann. Missouri Bot. Gardens 71: 191-201.
- Atwood, John T. 1987. The vascular Flora of La Selva Biological Station, Costa Rica , Orchidaceae Selbyana 10: 76-145.
- Atwood, John L. 1989. Orchids of Costa Rica. Icones Plantarum Tropicarum fasc.14. Marie Selby Bot. Gardens.
- Atwood, John T. 2000. Orchids of Monteverde .in: Monteverde, Ecology and Conservation of a Tropical Cloud forest In: Nadkarni and Wheelwright (eds.) Oxford U. Press, Oxford.
- Atwood John T., and D.E. Mora Retana 1999. Flora Costarricensis. Family # 39 Orchidaceae, Tribe Maxillariinae and Oncidinae. Feldiana Botany New Series No. 40.
- Baker, Charles O, and Margaret L. Baker 2006. Orchid species culture: *Oncidium Odontoglossum* alliance. Timber Press. Portland OR. 995p.
- Balick. M.J. M.H. Nee, and D.E. Atha 200. Checklist of the Vascular Plants of Belize. Mem. New York Botanical Garden 85: New York Bot. Garden Press, New York.
- Barringer, Kerry 1985. Three new species of *Elleanthus* (Orchidaceae) from Central America. Brittonia 286-290.
- Bateman, James. 1841. The Orchideacea of Mexico and Guatemala.
- Behar, Moises 1993. Orchids of Guatemala IONOS The Guatemalan Orchid Soc. 32pp.
- Blanco Coto M.A. 2002. Notes on the natural History of *Cyclopogon obliquus* (Orchidaceae, Spiranthidae) in Costa Rica. Lankesteriana 5: 3-8.
- Bockmuhl, L. 1989. *Odontoglossum*: a monograph and iconography. Bruecke Verlag Kart Schersow D.3200 Hildesheim, Germany.
- Cameron, K.M. , M. W. Chase, W. M. Whitten , P.J. Kores, D.C. Jarrell, V.A. Albert, T. Yukawa, H.G. Hills, and D, H, Goldman 1999. A Phylogenetic analysis of the Orchidaceae: evidence from rbcL nucleotide sequences. Amer. J. Bot. 86: 208-224.
- Carlswald, B.S., W. M. Whitten and N.H. Williams. 2003. Molecular Phylogenetics of Neotropical leafless Anangraecinae (Orchidaceae): reevaluation of genetic concepts. In J. Plant. Science. 164: 43-51.
- Carnevali, G. et al. 2001. Notes on the Flora of the Yucatan Peninsula II: A synopsis of the orchid flora of the Mexican Yucatan Peninsula and a tentative checklist of the Orchidaceae of the Yucatan Peninsula biotic province. Harvard Papers in Botany 5: 383-466.
- Chase, Mark W. 1986. A Monograph of *Leochilus* (Orchideaceae) Systematic Botany Monographs 14: The American society of Plant Taxonomy
- Chase, Mark W. 1992a. Oncidiiums: the *Oncidium leave* complex from Mexico and Central America. American Orchid Society Bull. 61: 137-145.
- Chase, Mark W. 1992b. Oncidiiums: the *Oncidium leuochilum* complex. American Orchid Society Bull. 61: 454-461.
- Chase, Mark W. 1997. Obligate Twig Epiphytism in the Oncidiinae and other Neotropical Orchids. Selbyana 10: 24-30.
- Chase, Mark W. et al. eds. 1997. The Pictorial Encyclopedia of *Oncidium*. ZAI Publ. New York, N.Y.
- Chase, Mark W. and N.H. Williams 2001. Additional transfers to *Trichocentrum* Poepp and Endl., and *Otoglossum* Garay and Dunst. (Orchideaceae: Oncidinae) Lindleyana 16: 218-219.
- Chase, M.W. , K.M. Cameron, R.L. Barrett and J.V. Freudenstein 2003. DNA Data and Orchideaceae Systematics: A new Phylogenetic Classification In: K.W. Dixon, S.P. Kelly, R.L. Barrett and P.J. Cribb (eds.) Orchid Conservation pp. 69-79. Nat Hist. Publ. Borneo, Kota, Kinabalu, Sabah.
- Correa, M.D., C. Galdames , Ms. De Stapf. 2004. Catalogo de las Plantas Vasculares de Panamá. Smithsonian Tropical Research Institute, Panama.

- Correll, D. S. 1950. Native Orchids of North América North of Mexico, Stanford University Press, Stanford, Ca.
- Darwin, Charles, 1888. The Various contrivances by which Orchids are fertilized by Insects 2nd ed. Jon Murray Publ., London 145pp.
- Daubresse, Balayer M. 2000. Le Genre *Sobralia*. Ruiz & Pav. (1794) au Costa Rica. *Orchidophile* 31: 162-168.
- Díaz Santos, Fabricio in: 2006. Listado Preliminar de Especies de Fauna Silvestre del Refugio de Vida silvestre, Río San Juan. Unpublished Internet. 33pp.
- Díaz Santos, Fabricio , 2008. Orquídeas del Río San Juan, Nicaragua ARAUCARIA, Managua, Nicaragua in press.
- Dix, Margaret A. and Michael W. Dix 2000. Orchids of Guatemala. Revised annotated checklist. Monogr. Syst. Botany, Missouri Botanical Gardens. 61pp.
- Dodson, C.H. 1975. *Dressleria* and *Clowesia* a New Genus and an Old one revived in the Catantini (Orchidaceae) *Selbyana* 1: 130-137.
- Dressler Robert L. and D. H. Dodson. 1960. Classification and Phylogeny in the Orchidaceae. *Ann. Missouri Bot Gardens*. 47: 25-68.
- Dressler, Robert L. 1980. Checklist of Orchids of Panama as known today. In: Williams and D.P.H. Allen Orchids of Panama. Monogr. Syst. Bot Missouri Bot. Garden. supp. 25pp.
- Dressler, Robert L. 1981. The Orchids: Natural History and Classification. Harvard U. Press, Cambridge Mass. 332. PP.
- Dressler, Robert L. 1986. Recent advances in Orchid Phylogeny. *Lindleyana* 1: 5-20.
- Dressler, Robert L. 1990. The major clades of the Orchideaceae – Epidendroidea. *Lindleyana* 5: 117-125.
- Dressler, Robert L. 1993a. Field Guide to the Orchids of Costa-Rica and Panama. Cornell University Press, Ithaca New York. 360pp.
- Dressler, Robert L. 1993b. Phylogeny and Classification of the Orchid Family. Dioscorides Press. Portland. OR. 313pp.
- Dressler, Robert L. 1998. A New White *Sobralia* from Costa Rica. *Orchid Digest* 62: 89-91.
- Dressler, Robert L. 2000a. Mesoamerican Orchid Novelties: 3 *Novon* 10: 193-200.
- Dressler, Robert L. 2000b. Precursor to a revision of the *Chondylorhyncha* complex. *Orquideologia* 21: 233-247.
- Dressler, Robert L. 2002a. New Species Combinations in Costa Rican Orchids: 2 *Lankesteriana* 3: 25-29.
- Dressler, Robert L. 2002b. The Major sections or Groups within *Sobralia* with four new species from Panama and Costa-Rica *S. crispissima*, *S. gloriana*, *S. mariannae* and *S. nutans*. *Lindleyana* 5: 9-15.
- Dressler, Robert L. 2003. Orchidiaceae. In: Hammel, B.E.; Grayson, M.H. Herrera, C, Zamora, N. (eds.) *Manual de Plantas de Costa Rica Vol. III Orchidaceae-Zingiberaceae*. Monogr. Syst. Bot. Missouri Bot. gardens 93: 1-884.
- Dressler, Robert L. and W. Higgins 2003. *Guarianthe* , a Generic Name for the “*Cattleya*” *skinneri* complex. *Lankesteriana* 7: 37-38.
- Dressler, Robert L. 2004a Orchideaceae: in: B.E. Hammel and et al. eds. *Manual de Plantas de Costa Rica- Volume III, Monocotiledoneas (Orchidiaceae-Zingiberaceae)*. Monogr. Syst. Bot. Missouri Bot. Garden 93.
- Dressler, Robert L. 2004b Una Clave preliminar para los *Trichopila* centroamericanos. *Orquideologia* 23: 35-42.
- Dressler, Robert L. 2004c Zwei Neue Arten *Elleanthus* aus Panama *J. Orchideenfreund* 11: 142-148.
- Dressler, Robert L. 2005. Six more new species of *Sobralia* from Panama In: *Orchids*:74: 937-941.
- Dressler, Robert L. and G.E. Pollard 1974. The Genus *Encyclia* in Mexico. *Asociación Mexicana de Orquideología*.
- Dressler, Robert L. and N.H. Williams. 2003. New combinations in Mesoamerican Oncidiinae (Orchidaceae). *Selbyana* 24: 44-45.
- Dunsterville, G and F. Dunsterville 1982. *Psychopsis* and *Psychopsiella*: One old and one new genus. *American Orchid Soc. Bull.* 51: 942-947.
- Fanfani, Alberto and Walter Rossi 1989. Simon and Schuster's Guide to Orchids. Simon and Schuster New York, New York. 255 pp.
- Folsom, J. 1987. A Systematic Monograph of the *Dichaea* section *Dichaea* (Orchidaceae) Doctoral Thesis, University of Texas, Austin, Texas.
- Fowlie, J.A. 1967. Observations on *Cattleya skinneri* and *C. deckeri* *Amer. Orchid Soc. Bull.* 36: 777-780.
- Fowlie, J.A. 1970. The Genus *Lycaste*. Azul Quinta Press. Panamá.
- Garay, Leslie. A. 1969. El complejo *Chondylorhyncha*. *Orquideologia* 4: 139-152
- Garay, Leslie A. 1970. A reappraisal of the genus *Oncidium* *Schweinf.* 19: 443-467.
- Garay, Leslie.A. 1974. Sinopsis del Genero *Arpophyllum* Orquidea (México) 4: 3-19.
- Garay, Leslie.A. 1979. The genus *Phragmapedium* *Orchid Digest* 43: 133-143.
- Garay Leslie. A. and G. Kennedy 1976. The Genus *Rossioglossum* *Orchid Digest* 40: 139-143.

- Garay, Leslie. A. and J.E. Stacey 1974. Synopsis of the Genus *Oncidium*. Bradea: 1: 393-424.
- Garay, Leslie A. and P. Taylor 1976. The genus *Oeceoclades* Lindl. Bot. Mus. Leaflets: 24: 249-274.
- Gerlach, Guenther and Jorge Beche 2004 Stantropinidae mesoamericanae (orchidaecae) III Restablecimiento de Stanhopea ruckem y una especie nueva Stanhopea confusa 4: 213 - 221 Lanlesteriana.
- Gregg, K.B. 1975. The effect of light intensity on sex expression in species of *Cynoches* and *Catacetum* (Orchidaceae) Selbyana 1: 101-113.
- Greer, Barney 1998. The Astonishing Stanhopeas (the Upside down Orchids). Sydney: The Australian Orchid foundation 92pp.
- Guevara, S., J. L. Borde and G. Sanchez. 1998. Are isolated remnant trees in pastures a fragmented canopy? Selbyana 19: 34-43.
- Guzman, L. and T. Gelio 1992. Los paisajes naturales de El Salvador y su flora de orquídeas. Orquidea (Mex.) 12: 209-224.
- Hagsater, Eric and Gerardo A. Salas 1990. Orchids of Mexico Icones Orchidearium Part I. Association Mex. de Orquideologia. 100pp.
- Hagsater, Eric and M.A. Soto Arias 2003. Orchids of Mexico Icones Orchidearium Part II, III. Asociacion Mex. de Orquideologia. 200pp.
- Halbinger, F. 1983. *Cymboglossum*, *Ticoglossum*, and *Rhynchos-tele* three genera of Mexico and Central America derived from *Odontoglossum*. Orquidea (Mex.) 9: 1-12.
- Halbinger, F. 1984. *Lemboglossum* a new name for *Odontoglossum cervantesii* complex. Orquidea (Mex.) 9: 351-354.
- Hamer, Fritz 1974. Las Orquídeas de El Salvador I Ministerio de Educación San Salvador, El Salvador. 374pp.
- Hamer, Fritz 1974. Las Orquídeas de El Salvador Vol. 2 Mary Selby Bot. Gardens Sarasota Fla. 427pp.
- Hamer, Fritz 1981. Las Orquídeas de El Salvador Vol. 3 Mary Selby Bot. Gardens Sarasota Fla. 304pp.
- Hamer, Fritz 1974. Las Orquídeas de El Salvador.. Ministerio de Educación, El Salvador.
- Hamer, Fritz. 1982a. Orchids of Nicaragua parts I. Icones Plantarum Tropicarum p 601-700.
- Hamer, Fritz 1982b. Orchids of Nicaragua part II. Icones Plantarum Tropicarum p.701-800.
- Hamer, Fritz 1983. Orchids of Nicaragua part III. Icones Plantarum Tropicarum p.801-900.
- Hamer, Fritz 1984a. Orchids of Nicaragua part IV. Icones Plantarum Tropicarum p.1000-1100.
- Hamer, Fritz 1984b. Orchids of Nicaragua part V. Icones Plantarum Tropicarum p.1101-1200.
- Hamer, Fritz 1985. Orchids of Nicaragua part VI. Icones Plantarum Tropicarum p.1201-1300.
- Hamer, Fritz 1988. Orchids of Central America an Illustrated Field Guide A-L. Selbyana 10: 1-430.
- Hamer, Fritz 1990. Orchids of Central America an Illustrated Field Guide M-Z. Selbyana 11: 423-860
- Hamer, Fritz 2001. Orchideaceae in: Flora de Nicaragua. Monographs in systematic botany from the Missouri Botanical gardens 85: II 1612-1860.
- Hamilton Allen, Paul 1965. Preliminary list of Orchids of El Salvador. AOS Bull. 627-631.
- Holdredge, L.R. 1971 Forest Environments in Tropical Life Zones a Pilot Study, Pergamon Press.
- Holliman Joanne, ed. 2002 Botanica's Orchids, Laurel Glen Publ. San Diego, CA. 603 pp
- Holst, Arthur W. 1999. The world of Catacetums. Timber Press, Portland OR. 306pp.:
- Horich, Clarence L. 1974. The Costa-Rican Stanhopea Species. IN: Orchid Digest 38:108.
- Horich, Clarence L. 1992. Zum Raetsel des Synchrischen Erbluhens einiger *Sobralia* Arten. Orchidee. 43: 210-212.
- International Orchid Commission. 1985. Handbook on Orchid nomenclature and registration. International Orchid Commission, London.
- Jenny, Rudolf and Lorenz Jenny 2007. Litbull Version 8, Orchid Bibliography on CD.
- Kaiser, R. 1993. The Scent of Orchids Editions Roche: Basel 259pp.
- Kimnach, Myron. 1978. The cultivation of *Stanhopea* and its allies. Amer. Orchid Soc. Bull. 47: 784-794
- Lawrence ,Anna and W. Hawthorne 2006. Plant identification: Creating user friendly field guides for Biodiversity Management. Earthscan, London, U.K. 267pp.
- Lucas Rodriguez, Rafael D. E. Mora, M. E. Barahona, and N.H. Williams 1986. Generos de Orquídeas de Costa Rica. San Jose: Editoria Univ. Costa Rica. 334pp.
- Luer, C.A. 1986a. Systematics of the Pleurothallidinae (Orchidaceae) Monographs in Systematic Botany. 15: 1-81.
- Luer, C.A. 1986b. Systematics of *Masdevallia* (Orchidaceae) Monographs in Systematic Botany. 16: 1-63.
- Luer C.A. 1986c. Systematics of *Pleurothallis* (Orchidaceae) Monographs in Systematic Botany. 20: 1-109.

- Luer C.A. 1988. Systematics of *Dressleriella* and *Scaphosepalum* (Orchidaceae) Monographs in Systematic Botany. 26: 1-111.
- Luer C.A. 1990. Systematics of *Platystyle* (Orchidaceae) Monographs in Systematic Botany. 38: 1-135.
- Luer C.A. 1991. Systematics of *Lepanthopsis*, *Octomeria*, subgenus *Pleurothallopsis*, *Restrepiella*, *Restrepiopsis*, *Salpistele*, and *Teagueia*. (Orchidaceae) Monographs in Systematic Botany: 39: 1-161.
- Luer, C.A. 1986-2004. Icones Pleurothallidarum, I-XXVI Monogr. Syst. Bot. Missouri Bot. Garden. MGB Press. St. Louis, Missouri.
- Luer, C.A. 2004. New genera and combinations in the Pleurothallidinae. Mongr. Syst. Botanical Gardens. 95: 353-265.
- Mayr, Ernst. 1969. Principles of Systematic Zoology Mc Graw-Hill, New York 137 pp.
- Mora Retana, Dora E. and Joaquin B. García. 1992. Lista Actualizada de Orquideas de Costa Rica. Brenesia 37: 79-124.
- Mora Retana, Dora E. and John Atwood 1992. Orchids of Costa Rica. Icones Plantarum tropicarum Series I. 15: 1401-1500.
- Mora Retana, Dora E. and John Atwood 1993. Orchids of Costa Rica. Icones Plantarum Tropicarum Series I 16: 1501-1600.
- Morales, Juan Francisco. 2001. Orquideas, Cactus y Bromelias del Bosque Seco Costa Rica/Orchids, cactus and Bromeliads of the Dry Forest. Editorial InBio San José Costa Rica. 162pp.
- Morales, Juan Francisco. 2005. Orquideas de Costa Rica /Orchids of Costa Rica Vol. 1. Editorial InBio. San José C.R. 180 pp..
- Morales, Juan Francisco. 2005. Orquideas de Costa Rica /Orchids of Costa Rica Vol. 2. Editorial InBio. San José C.R. 166 pp.
- Muñoz, Francisco and Aldo Velásquez 2006. Investigación de Árboles aves y Orquideas en Zonas Cafetaleras. EDISA, Managua, Nicaragua 61pp.
- Oakes, Ames T , F. Hubbard, and C. Schweinforth 1936. The Genus *Epidendrum* in the United States and Middle America Botanical Museum , Cambridge Mass.
- Oakes, Ames and Donovan Stewart Correll, 1952. Orchids of Guatemala. Feldiana Botany (Chicago Nat. Hist. Mus.) 395pp.
- Oakes, Ames and Donovan Stewart Correll. 1952-53 (reprinted 1985). Orchids of Guatemala and Belize three parts bound in one. Dover Publications Inc. General Publ. Co. Toronto Canada 779 pp.
- Oakeley, Henry Francis 1993. *Lycaste* species the essential guide Vigo Press, Ltd. 35pp.
- Oakeley, Henry Francis 2008 *Lycaste*, Ida and Agulosa, the essential guide cambrian Printers, u,k, 443p.
- Oberg, R. 1993. 1974. Orquideas colectadas en Laguna Ocotol Grande , México. Orquídea (Méx.) 4: 175.
- Ossenbach, Carlos, Franco Pupulin, and Robert Dressler 2007. Orquideas del istmo Centroamericano: Catalogo y estado de Conservación/Checklist and conservation status:Orchids of the Central American Isthmus editorial 25 de Mayo 243pp.
- Pabst, F.J. 1978. An illustrated key to the species of the Genus *Mormodes* Lindl.(Orchidaceae) . Selbyana: 2: 149-155.
- Pridgeon. A.M. 1978. Una revisión de los Géneros *Coelia* y *Bothytrechilus*. Orquídea (Mex) 7: 57-94.
- Pridgeon, A.M. 1982. Diagnostic anatomical Characters in the Pleurothallinae (Orchidaceae) . American Journal of Botany. 69: 921-938.
- Pridgeon, A.M. and M.W. Chase 2001. A Phylogenetic Reclassification of Pleurothallinae (Ochideaceae) Lindleyana 16: 235-271.
- Pridgeon A.M. , Cribb P.J. , M.W. Chase and E,N, Rasmussen 2003. Genera Ochidaceareum. 3: Vanilloideae Oxford Univ. Press, Oxford, U.K.
- Rasmussen, F.N. 1977. The Genus *Corymborkis* Thou (Orchidaceae) a taxonomic revision. Botaniska Tidskrift 71: 161-192.
- Pridgeon, A.M. 1992. Diagnostic anatomical characters in the Pleurothallinae, (Orchideaceae). Am. J. Bot. 69: 921-938.
- Pridgeon A.M. P.J. Cribb , M.W. Chase and E.W. Rasmussen eds 2001. Genera Orchdeaceum 3: Orchideaceae: Vanilloideae. Oxford U, Press. Oxford U.K. 365pp.
- Pupulin, Franco 1998. Manuel Antonio National Park Orchids: A photographic field guide to the discovery and identification of the orchids living in the park. Mesoamerican Press San José 74 pp.
- Pupulin, Franco. 2002. Catalogo Revisado y Anotado de las Orchideaceae de Costa Rica Lankesteriana. 4: 1-88.
- Pupulin, Franco, 2005 Vanishing Beauty: Native Costa Rican OrchidsVol. 11 *Acianthera-Kegeliella*. Editorial Universidad de Costa Rica. San José Costa Rica. 421pp.
- Quijano Maradiaga, Jose T. 2007. Caracterización de las Especies de Orquideas del Parque Ecológico Municipal Humedales de Mahogany y áreas de Amortiguamiento,, Región Atlántico Sur, Nicaragua. Tesis de Licenciatura. -pp.

- Rasmussen E.N. 1999. The development of Orchid classification In: In A. M. Pridgeon et al eds. *Genera Orchdeaceum 3: General Introduction* pp. 3-12. Oxford U. Press. Oxford U.K.
- Renz, J. 1980. Probleme der Orchideengattung *Habenaria*: Die Orchidee. 31:64-72, 93-98.
- Ritterhausen, Brian and Sara Ritterhausen 2000. *Orchids, a Care Manual*. Laurel Glen Publ. San Diego, CA. 127 pp.
- Rodríguez Caballero, Rafael Mora, Dora Mora, Emilia Barahona, Maria Eugenia, and Norris Williams 1985. Géneros de Orquideas de Costa Rica. Editorial Universitaria de Costa Rica, San José
- Rodríguez, Caballero R.L. 1986. Orquideas de Costa Rica Editorial Universidad de Costa Rica, San José Costa Rica -pp.
- Romero, G.A. 1990. Phyogenetic relationships in Sub tribe Catacetinae (Orchidaceae) Lindleyana 5: 160-181.
- Romero G.A. and C.E. Nelson. 1986. Sexual Dimorphism in *Catasetum* orchids: forcible pollen emplacement and male flower competition. Science 232: 1538-1540.
- Roubik, David W. and Paul E. Hanson 2004. Abejas de Orquideas de America Tropical Biología y Guía de Campo/ Orchid bees of tropical America Biology and Field Guide. Editorial, InBio. San José, Costa Rica. 370 pp.
- Salazar Chávez, G.A. 1994. Recent advances in problems of taxonomy of *Mormodes*. Proc. 14 th world orchid conference, Glasgow 1993. Her Majesty's stationary Office , Edinburgh, Scotland.
- Salazar Chavez, G.A. 1996. Conservation threats In: IUCN/ SSC Orchid Specialist group Orchids: Status survey and conservation Action plan pp. 6-10.
- Salazar Chávez, G.A., M.W. Chase, M.A. Soto Arenas y M. Ingouille 2003. Phylogenetics of the Chranichidae with emphasis on Sprianthinae (Orchidaceae, Orchidiodae): Evidence from plastid and nuclear DNA sequences. Amer. J. Botany 90: 777-795.
- Sandoval Zapotilla, E. and T. Terrazas 1991. Leaf anatomy of 16 taxa of the *Trichocentrum* clade (Orchidaceae: Oncidiinae) Lindleyana 16: 81-93.
- Schlechter, R. 1922. Beitrage zur Orchideenkunde von Zentralamerika. Fedde Reportorium Specierun Novarum regni vegetabilis. 17: 1-95.
- Schlechter, R. 1923. Beitrage zur Orchideenkunde von Zentralamerika II Additamenta an Orchidologiam Costarricense III Orchidaceae Brenessianae. Fedde Reportorium Specierun Nivarum regni vegetabilis. 19: 1-326.
- Schweinfurth, C. 1938. New orchids from Central America. Botanical Museum Leaflets, Harvard University 5: 89-99.
- Schweinfurth, C, and D. S. Corell. 1940. The Genus *Palmorchis*. Botanical Museum Leaflets. 3: 109-119.
- Siegerist, E.S. 1986. The Genus *Dimerandra* Botanical Museum Leaflets. 30: 199-222.
- Silvera, Gaspar A, 2003. Cultivo de Orquideas en Climats Tropicales. Panamá 207pp.
- Solano, R. 1993. El Genero *Stelis* en México. Orquídea (Méx.) 13: 1.
- Soto Arenas M.A. 2003. *Vanilla* (tratamiento genérica) In A. M. Pridgeon et al. eds. *Genera Orchdeaceum 3: Orchidaceae:Vanilloidae* pp. 321-334. Oxford U. Press. Oxford U.K.
- Soto Arenas M., G.A. Salazar, and A. Rojas. 1993. Nomenclatural Changes in *Rhynchostele*, *Mesoglossum* and *Lembo-glossum* (Orchidaceae: Oncidiinae).Orquídea (Mex.) 13: 145-152.
- Standley, and L.O. Williams 1952. *Oncidium aurosasinorum* Standl. and Wms. sp. nov. Ceiba 3: 39-40.
- Saurez Bolanos, Edgar, y Jorge Morales López 2007. Como Cultivar Orquideas en su Casa. Mundo Grafico, San José. 225pp.
- Szlatchetko, D. 2004a. Materiaux pour la revision des Habenariinae (Orquidaceae: Orchidoidae) Richardiana 4: 52-65.
- Szlatchenko, D. 2004b. Materiaux pour la revision des Habenariinae (Orquidaceae: Orchidoidae). Richardiana 4: 103-108.
- Szlatchenko, D. 2005. Contributions to the taxonomic revision of the subtribes Spiranthinae , Stennorrhynchidinae and Cyclopoginae (Orchidaceae) in Mesoamerica and the Antilles. Polish Bot. St. 20: 1-307.
- Thien, L.B. and V. Rico Garay 2004. Ant Orchid Interactions. Orchids 73: 606-607.
- van der Pije, L. and C.H. Dodson 1966. Orchid flowers: Their Pollination and Evolution. U. of Miami Press, Coral Gardens 269pp.
- Villa-Lobos J. 1991. Threatened Plants of Middle America. Smithsonian IUCN Washington D.C.
- Werner, Patrick 2001. An Introduction to Nicaraguan Orchids. Impresión Comercial La Prensa, Managua, Nicaragua. 101 pp.
- Williams L.D. 1951. The Orchidacea of Mexico. Ceiba 2: 1-321.
- Williams, L.D. and P.A. Allen 1946-1949. (reprinted 1980) Orchidaceae In: Flora of Panama R.J. Woodson and R.W. Schery eds. Ann. Missouri Bot. Gardens 33(1,4) 36 (1,2), 590pp.

- Williams, N.H. and M. Chase 2001. Phylogenetic positions of *Miltoniopsis Caucasea* a new Genus *Cyrtochilioides* and *Oncidium phymatochilum* (Orchideaceae: Oncidiinae) based on nuclear and plastid DNA sequence data. *Lindleyana* 16: 272-285.
- Withner, Carl L. 1988a. The Cattleyas and their relatives Vol. I. the Cattleyas Timber Press. Portland Oregon. 147pp.
- Withner, Carl L. 1988b. The Cattleyas and their relatives Vol. III. Schomburgkia, Sophronites and other South American Genera. Timber Press. Portland Oregon. 136pp.
- Withner, Carl L. 1998. The Cattleyas and their relatives Vol. V. Brassavola, Encyclia, and other Genera of Central America Timber Press. Portland, Oregon. 199pp.
- Withner, Carl L. and Patricia A. Harding 2004. The Cattleyas and their relatives Vol. I. the debatable Epidendrums Timber Press. Portland, Oregon. 300 pp.
- Whitten, W.M. , Williams, N.H. and M. W. Chase 2000. Subtribal and Generic Relationships of Maxillariae (Orchideaceae) with emphasis on Stanhopeinae *Amer. J. Bot.* 87: 1842-1855.
- Whitten, M. W. , Williams, N. H., Dressler R.L., Gerlach, G. and F. Pupulin 2005. Generic Relationships of Zygopetalinae.
- Williams, L.O. 1951. The orchideaceae of Mexico *Ceiba* 2: 1-344.

INTERNET REFERENCES

Although many hundred web pages were consulted, these were found to be particularly useful.

INSTITUTIONS	URL
Organización Para Estudios Tropicales Costa Rica, Bibliografía Nacional	http://orton.catie.ac.or
Missouri Botanical Gardens	http://mbot.mbot.org/
	http://mesoamericanorcid.de/literature
University of Basel Herbarium	http://orchid.unibas.ch/
Southwest Environmental Information Network	http://seinet.asu.edu/
Compilation Icones Plantarum Tropicarum Series I and II	http://http://www.lbin.com/cd_roms/orcids.html
Smithsonian plants checklist	http://http://www.mnh.si.edu/biodiversity/bdg/plants.html
	http://wiki.terrochid.org/
	http://zipcodezoo.com/plants/
	http://www.autrevie.com
Global Biodiversity Information Facility	http://www.gbif.org
Harvard University Herbaria	http://www.huh.harvard.edu/databases
	http://www.orchidculture.com
	http://www.pleurothallids.com
	http://www.plantsystematics.org

Former Name	Actual Name
Apatostelis	Stelis
Aulosepalum	Deiregyne
Beadlea	Cyclopogon
Beloglottis	Rhynchoatele
Bothytrechylus	Coelia
Cattleya	Guarianthe
Chondylorhyncha	Benzingia
Cranichis	Wulfschlaegelia
Cyrtophoranthus	Zootrophion
Encyclia	Encyclia, Dinema, Prosthechea, Oestlundia
Epidanthus	Epidendrum
Erythrodes	Platythelys
Gularia	Scheidiella
Hexadesmia	Scaphyglottis
Hexesia	Scaphyglottis
Kionophyton	Gracielanthus
Leochilus	Leochilus, Goniochilus
Leucohyle	Trichopila
Malaxis	Crossoglossa, Malaxis
Maxillaria	Maxillaria, Heterotaxis
Mendocella	Galeottia
Miltonioides	Oncidium
Nageliella	Domingoa
Nanodes	Epidendrum
Neourbania	Maxillaria
Neolehmannia	Epidendrum
Odontoglossum/ Lemboglossum	Oncidium
Oerstedella	Epidendrum
Oncidium	Oncidium, Chelyorchis, Cohniella, Cyrtorchiloides, Lophiaris
Osmoglossum	Cuitlauzina
Pachystele	Scaphyglottis
Pleurothallis	Pleurothallis, Acianthera, Echinosepala, Empusella, Specklinia, Trichosalpinx, Stelis
Psygmorechis	Erycina
Phytinga	Epidendrum
Physosiphon	Specklinia
Restrepiella	Restrepiella, Pleurothallopsis
Sacoila	Stenorrhynchus
Schomburgkia	Laelia
Stelilabium	Telipogon
Otros generos nuevos	Homalopetalum, Microchilus, Stenotyla, Triphora, Zukowskia

Former Name	Actual Name
Amparoa costarricensis	Rhyncholepta beloglossa
Apatostelis crescenticola	Stelis crescenticola
Apatostelis glossula	Stelis glossula
Apatostelis inaequalis	Stelis inaequalis
Apatostelis rubens	Stelis rubens
Arpopyllum medium	Arpopyllum alpinum
Aulosepala hemicrea	Deirigyne hemicrea
Barbosella anaristella	Barbosella dolichorhiza
Barkeria chinensis	Barkeria obovata
Baservilla nicaraguensis	Baskervilla colombiana
Beadlea comosa	Cyclopogon comosa
Beadlea cranichoides	Cyclopogon cranichoides
Beadlea elatus	Cyclopogon elatus
Beadlea miradorensis	Cyclopogon miradorensis
Beadlea obliquus	Cyclopogon obliquus
Beadea prassophyllum	Cyclopogon prassophyllum
Beloglottis subpandurata	Crossoglossa fratum
Bletia edwardsii	Bletia campanulata
Bothytrechylus macrostachyus	Coelia macrostachyus
Brassia mexicana	Brassia signata
Cattleya aurantiaca	Guariente aurantiaca
Cattleya deckeri	Guariente pattinii
Cattleya guatemalensis	Guariente skinneri ssp.guatemalensis
Cattleya pattinii	Guariente pattinii
Cattleya skinnerii	Guariente skinnerii
Chondylorhyncha helleri	Stenotyla helleri
Chondylorhyncha lendleyana	Benzingia reichembachiana
Chysis costarricensis	Chysis bruennowiana
Coryanthes speciosum	Coryanthes gracilis
Cyrtophoranthus endresianus	Zootrophion endresianus
Cyrtophoranthus moorei	Zootrophion moorei
Cryptarrhena quadricornuta	Cryptarrhena guatemalensis
Cyrtopodium punctatum	Cyrtopodium maculatum
Dichaea similis	Dichaea poicillantha
Dichaea verrucosa	Dichaea pendula
Dressleriella suavis	Dressleriella eburnea
Elleanthus curtii	Elleanthus alberti
Encyclia abbreviata	Prosthechea abbreviata
Encyclia adenoparpon	Encyclia papillosa

Former Name	Actual Name
Encyclia baculus	Prosthechea baculus
Encyclia brassavolae	Prosthechea brassavolae
Encyclia chacaoensis	Prosthechea chacaoensis
Encyclia chondylobulbon	Prosthechea chondylobulbon
Encyclia cochleanthes	Prosthechea cochleanthes
Encyclia fragrans	Prosthechea fragrans
Encyclia dickensoniana	Encyclia chiapaensis
Encyclia livida	Prosthechea livida
Encyclia luteorosea	Oestlundia luteorosea
Encyclia ochracea	Prosthechea ochracea
Encyclia polybulbon	Dinema polybulbon
Encyclia pygmaea	Prosthechea pygmaea
Encyclia radiata	Prosthechea radiata
Encyclia rhynchophora	Prosthechea rhynchophora
Encyclia vespa	Prosthechea vespa/venezuelana?
Epidanthus paranthicus	Epidendrum paranthicus
Epidendrum carpophorum	Epidendrum tridens
Epidendrum cristobalense	Epidendrum laucheanum
Epidendrum dolychostachyum	Epidendrum laucheanum
Epidendrum hawkesii	Epidendrum baumanianum
Epidendrum imatophyllum	Epidendrum flexosum
Epidendrum nubium	Epidendrum arbuscula
Epidendrum rigidum	Epidendrum angustisegmentum
Epidendrum viejii	Epidendrum fruticasum
Eurystyle borealis	Eurystyle ananassocomus
Galeandra batemanni	Galeandra dives
Gongora quinquenervis	Gongora leucohila
Govenia capitata	Govenia utriculata
Govenia deliciosa	Govenia lillieae
Gularia trilineata	Scheidiella trilineata
Habenaria bractensis	Habenaria pringlei
Habenaria floribunda	Habenaria odontopetala
Habenaria hondurensis	Habenaria wercklei
Hexadesmia crurigera	Scaphyglottis crurigera
Hexadesmia fasciculata	Scaphyglottis fasciculata
Hexadesmia micrantha	Scaphyglottis micrantha
Hexadesmia tenella	Scaphyglottis tenella
Hexesia bidentata	Scaphyglottis bidentata
Hexesia imbricata	Scaphyglottis imbricata
Isochilus amparoana	Isochilus chiriquensis

Former Name	Actual Name
Jacquinella teres	Jacquinella teretefolia
Lepanthes pristidis	Lepanthes disticha
Leochilus leochilinus	Goniochilus leochilinus
Leucohyle subulata	Trichopila subulata
Lockhartia integra	Lockhartia pittneri
Lycaste brevispatha	Lyscaste angelae
Malaxis corymbosa	Malaxis brachystachys
Malaxis maxonii	Malaxis excavata
Malaxis parthonii	Malaxis histronantha
Malaxis tipuloides	Crossoglossa tipuloides
Maxillaria acutifolia	Maxillaria angustissima
Maxillaria amparoana	Maxillaria ringens
Maxillaria crassifolia	Heterotaxis crassifolia
Maxillaria discolor	Heterotaxis discolor
Maxillaria foliosa	Maxillaria acervata
Maxillaria hematoglossa	Maxillaria punctostriata
Maxillaria maleolens	Heterotaxis maleolens
Maxillaria valenzuelana	Heterotaxis valenzuelana
Maxillaria wrightii	Maxillaria schlechteriana
Maxillaria xylobiflora	Maxillaria brachybulbon
Mendocella grandiflora	Galleottia grandiflora
Miltonioides pauciflora	Oncidium bracteatum
Miltonioides stenoglossa	Oncidium bracteatum
Mormodes buccinator	Mormodes horichii
Nageliella purpurea	Domingoa purpurea
Nanodes discolor	Epidendrum congestoides
Neourbania nicaraguensis	Maxillaria nicaraguensis
Neolehmannia barbeyana	Epidendrum barbeyana
Neolehmannia difformis	Epidendrum chlorycorhymbos
Neolehmannia porpax	Epidendrum peperomia
Octomeria surinamensis	Octomeria graminifolia
Octomeria valerioi	Octomeria costarricensis
Odontoglossum cordatum	Rhynchosele cordatum
Odontoglossum rossii	Rhynchosele rossii
Oncidium altissimum	Lophiaris altissimum
Oncidium ampliatus	Chelyorchis ampliatus
Oncidium ascendens	Cohniella ascendens
Oncidium aurosasinorum	Lophiaris aurosasinorum
Oncidium carthagenense	Lophiaris carthagenense
Oncidium cebolleta	Cohniella cebolleta

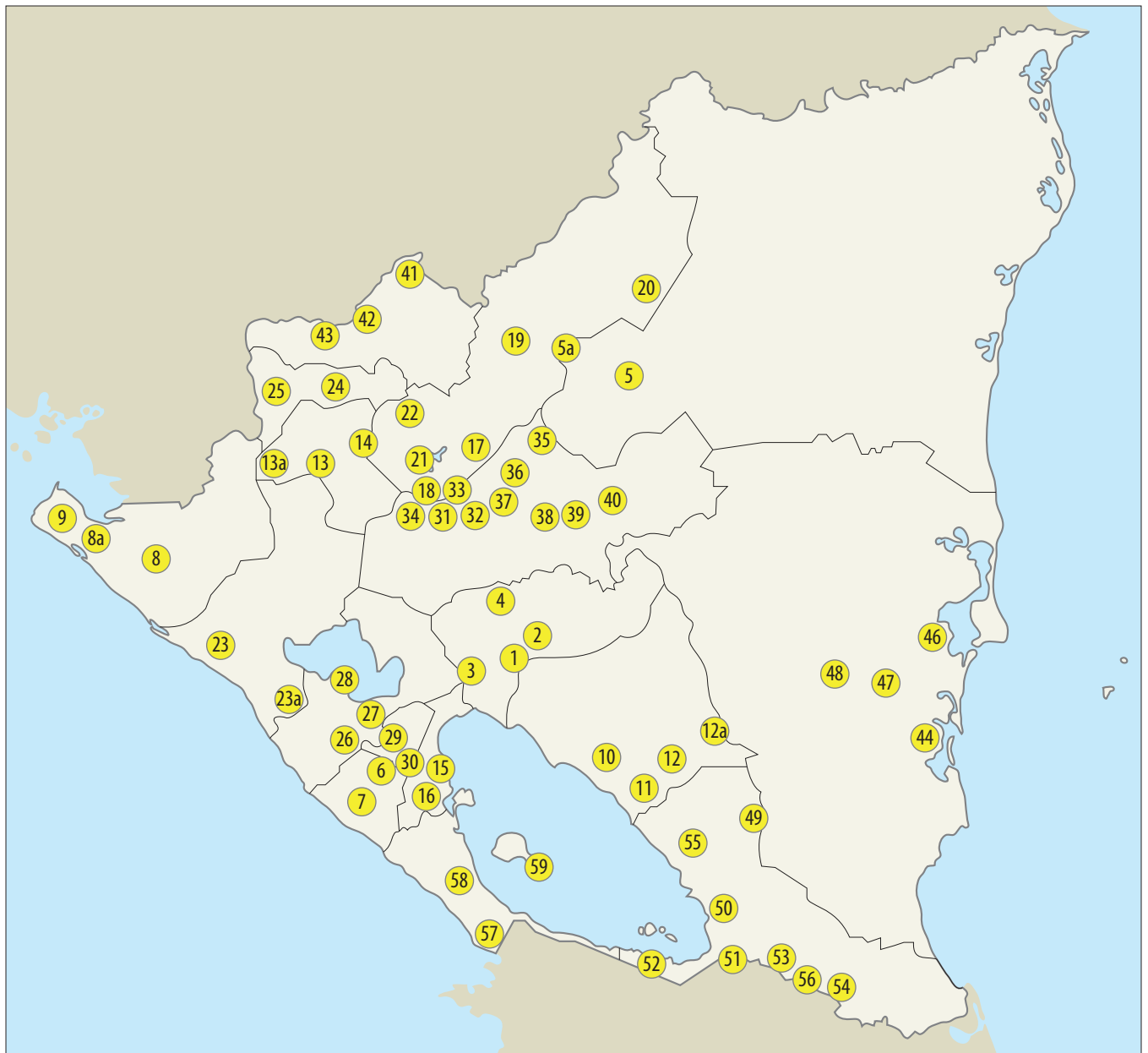
Former Name	Actual Name
Oncidium christa-galli	Erycina christa-galli
Oncidium luridum	Lophiaris luridum
Oncidium paleatum	Oncidium bracteatum
Oncidium teres	Cohniella stipitata
Oerstedella centradenia	Epidendrum centradenia
Oerstedella pansamalae	Epidendrum pansamalae
Oerstedella verrucosa	Epidendrum verrucosa
Osmoglossum egertonii	Cuitlauzina egertonii
Osmoglossum pulchellum	Cuitlauzina pulchellum
Pachystele dubia	Scaphyglottis livida
Pelexia obliquus	Cyclopogon obliquus
Pelexia richardiana	Sarcoglottis schaffneri
Phragmapedium warscewiczianum	Phragmapedium existamidium ssp. warscewiczianum
Physinga physodes	Epidendrum physodes
Physosiphon ochraceus	Specklinia tubata
Physosiphon spiralis	Stelis deregularis
Platystyle querticola	Microchilus querticola
Pleurothallis abjecta	Pleurothallis barbata
Pleurothallis alexii	Specklinia alexii
Pleurothallis blaisdellii	Trichosalpinx blaisdellii
Pleurothallis brighami	Specklinia brighami
Pleurothallis carioi	Pleurothallis angustifolia
Pleurothallis carnosilabia	Stelis carnosilabia
Pleurothallis cedralensis	Trichosalpinx cedralensis
Pleurothallis circumplexa	Acianthera circumplexa
Pleurothallis cobanensis	Stelis cobanensis
Pleurothallis cogniauxiana	Acianthera cogniauxiana
Pleurothallis convallaria	Stelis convallaria
Pleurothallis erinacea	Kraenzlinella sigmoidea
Pleurothallis excelsilabia	Specklinia excelsilabia
Pleurothallis foliata	Trichosalpinx dura
Pleurothallis gelida	Stelis gelida
Pleurothallis glandulosa	Specklinia glandulosa
Pleurothallis grobyi	Specklinia grobyi
Pleurothallis guanacastensis	Specklinia guanacastensis
Pleurothallis hastata	Specklinia hastata
Pleurothallis hondurensis	Acianthera hondurensis
Pleurothallis immersa	Stelis immersa
Pleurothallis lappiformis	Echinosepala lappiformis

Former Name	Actual Name
<i>Pleurothallis memor</i>	<i>Trichosalpinx memor</i>
<i>Pleurothallis pantasmi</i>	<i>Acianthera pantasmi</i>
<i>Pleurothallis pubescens</i>	<i>Acianthera pubescens</i>
<i>Pleurothallis quadrifida</i>	<i>Stelis quadrifida</i>
<i>Pleurothallis tribuloides</i>	<i>Specklinia tribuloides</i>
<i>Pleurothallis tuerckheimi</i>	<i>Stelis megachlamys</i>
<i>Pleurothallis uncinata</i>	<i>Echinosepala uncinata</i>
<i>Pleurothallis verecunda</i>	<i>Acianthera verecunda</i>
<i>Prescottia cordifolia</i>	<i>Prescottia stachyodes</i>
<i>Psygmorechis gnoma</i>	<i>Erycina gnoma</i>
<i>Psygmorechis pusilla</i>	<i>Erycina pusilla</i>
<i>Restrepia xanthoptalma</i>	<i>Restrepia muscifera</i>
<i>Restrepiella ujarensis</i>	<i>Pleurothallopsis ujarensis</i>
<i>Sacoila lanceolata</i>	<i>Stenorrhynchos lanceolata</i>
<i>Scaphyglottis dubia</i>	<i>Scaphyglottis livida</i>
<i>Scaphyglottis huebneri</i>	<i>Scaphyglottis boliviensis</i>
<i>Scaphyglottis stenopetala</i>	<i>Scaphyglottis graminifolia</i>
<i>Schomburgkia superbiens</i>	<i>Laelia superbiens</i>
<i>Sobralia feniziana</i>	<i>Sobralia decora</i>
<i>Sobralia lindelyana</i>	<i>Sobralia crispissima</i>
<i>Sobralia powellii</i>	<i>Sobralia cysostoma</i>
<i>Sobralia suaveolens</i>	<i>Sobralia bletiae</i>
<i>Sobralia triandra</i>	<i>Sobralia bouchei</i>
<i>Spiranthes amesiana</i>	<i>Spiranthes torta</i>
<i>Stelilabium helleri</i>	<i>Telipogon helleri</i>
<i>Stelis bidentata</i>	<i>Stelis parvula</i>
<i>Stelis gracilis</i>	<i>Stelis panamensis</i>
<i>Stelis maxonii</i>	<i>Stelis purporascens</i>
<i>Stelis panamensis</i>	<i>Stelis gracilis</i>
<i>Stelis perplexa</i>	<i>Stelis aemula</i>
<i>Stelis vulcanicola</i>	<i>Stelis argentata</i>
<i>Xylobium powellii</i>	<i>Xylobium sulfurinum</i>
<i>Xylobium tuerckheimii</i>	<i>Xylobium sulfurinum</i>

STUDIED AREAS

BOACO	Momotombito	1
	El Paraíso	2
	Teustepe	3
	Santa Lucia	4
BOSAWAS	Cerro Kum	5
	El Naranjo	5a
CARAZO	San Marcos	6
	La Conquista	7
CHINANDEGA	Chinandega	8
	El congo	8a
	Cosiguina	9
CHONTALES	Juigalpa	10
	Road to San Carlos	11
	Santo Tomas	12
	El chilamate	12a
ESTELI	Cerro Tisey	13
	San Juan de Limay	13a
	Miraflor	14
GRANADA	Volcan Mombacho	15
	Domitila reserve	16
JINOTEGA	Datanli el Diablo	17
	Matagalpa-Jinotega road	18
	Cerro Kilambe	19
	Cerro Saslaya	20
	Finca El Jaguar	21
	Cerro Yali	22
LEON	I. Juan Venado-Poneloya	23
	La Paz Centro	23a
MADRIZ	Cerro Fraile	24
	Tepesomoto Patate	25
MANAGUA	El Crucero/Las Nubes	26
	Chocoyero /Montibelli	27

	Peninsula de Chiltepe	28
MASAYA	Volcan Masaya	29
	Laguna de Apoyo	30
MATAGALPA	Selva Negra Vic.	31
	Cerro Apante	32
	Cerro Arenal	33
	Cerro Largo-Cerro Piedra	34
	Peñas Blancas	35
	El Tuma	36
	Yasica Sur	37
	San Ramon	38
	Finca Esperanza Verde	39
	Cerro Musun	40
NUEVA SEGOVIA	Cordillera de Dipilto –San Fernando	41
	Cordillera de Dipilto – Jalapa	42
	Cordillera de Dipilto – Dipilto	43
RAAS	Bluefields	44
	Corn Island	45
	Pearl Lagoon	46
	Rama	47
	Rio Mico	48
RIO SAN JUAN	Acoyapa	49
	San Miguelito	50
	Esperanza Verde	51
	Los Guatuzos	52
	Rio Sabalos	53
	Refugio Bartola	54
	Road to San Carlos	55
	El Castillo	56
RIVAS	Reserva silvestre La Flor	57
	Tola	58
OMETEPE I	Volcan Maderas	59



GLOSSARY

Accipital	terminal
Acuminate	Ending in a long narrow point, usually in reference to leaves or sepals.
Acute	sharp angle between 45 and 90 degrees.
Adnate	different structures attached along entire length.
Adventitious	roots along length of entire stem.
Afoliate	leafless.
Aggregate	clustered
Anther	male structure of flower containing pollen.
Apex	terminal tip.
Apicule	short claw-like point at tip of structure.
Aplanate	flattened.
Appendis	appendage
Arched	curved upward.
Aromatic	scented, fragrant.
Articulate	jointed.
Asperous	rough.
Asymmetrical	lacking bilateral symmetry.
Attenuate	elongate, gradually tapering to a point.
Auricle	ear like extension.
Axil	where leaf meets pseudobulb or stem, flower buds often form here.
Axillary	originating at the Axil.
Basal	near the point of attachment.
Beak	apical horn-like projection
Bicallose	two hard thickenings on organ.
Bicuspidate	with two projections.
Bifid	divided into two parts with cleft in between.
Bifoliate	two leafed
Bifurcate	forked
Bilateral	having two equal halves in a vertical plane.
Bilobed	divided into two lobes.
Blade	exposed part of leaf, not including base.
Bract	basal leaf sheath.
Bulbous	thickened stem at base.
Callus	crest or fleshy protuberance of the lip.
Conalliculate	deeply groved
Capitale	en larged globular at tip, knoblike
Carinae	raised nerves.
Carnose	fleshy.
Cauda	tail-like growth.
Cespitose	growing in tufts or clumps.
Chin	mentum.

Ciliate	having many fine hairs.
Circinate	coiled, spiral.
Cleistogamous	self pollinating flower that does not open.
Column	central structure composed of style and anthers.
Compressed	laterally flattened.
Concave	depressed in ward
Conduplicate	leaf or leaf-like organ folded in lengthwise in two.
Confluent	merging together.
Connate	joined together, fused at the base.
Convex	inflated outward
Convolute	leaves that are ruffled during their development.
Coraloid	thick irregularly branched roots.
Coriaceous	leathery.
Cordate	heart-shaped leaf.
Costate	single midrib or vein.
Crenate	edge with short rounded teeth.
Cuneate / Cunciform	wedge- shaped.
Cusp	short hard point.
Cymbiform	boat-shaped.
Dentate	tooth-like projections on margin.
Depressed	flattened from above.
Descending	going downward.
Diffuse	widely spaced.
Disc	upper surface of labellum.
Distal	away from the base.
Distichous	alternating opposite.
Dorsal	Part of the flower that is opposite the lip.
Dolabriform	hatchet shaped.
Duplicate	Leaves folded in two during development.
Elliptic	elongate circle.
Elongate	stretched/extended.
Ephemeral	very short duration, a few hours.
Epichile	last portion of a complex lip as in Stanhopinidae.
Epiphyte	growing on trunk or stems of another plant.
Erose	very fine saw edged.
Explanate	spread out.
Falcate	flat curved like sickle.
Fasciculate	bunched, clustered.
Filliform	thin threadlike.
Fimbriate	edge fringed with long fine extensions.
Flabelliform	fan shaped.
Fleshy	thickened, enlarged turgid with liquid.
Flexible	able to bend easily.
Foliar	lea flike

Foliate	with leaves.
Fringed	border with fine extensions.
Fugacious	ephemeral, lasting only a short time.
Furfuraceous	covered in scaly particles.
Fusiform	elongate cylinder.
Genus	refers to the first part of the Latin binomial; a group of closely related species.
Glabrous	smooth, shiny surface.
Glabular	resembling a gland
Globose	Spherical.
Herbaceous	without woody stem, as in many ground orchids whose leaves die back.
Hirsute	hairy.
Hispid	with bristles.
Hyaline	transparent, glassy
Hypochile	basal part of complex lip eg. Stanhopinidae.
Inflorescence	individual of group of flowers.
Imbricate	overlapping
Incumbent	reposing on a surface.
Incurved	curved inwards.
Inflated	balloon-like.
Inflorescence	a shoot bearing flowers.
Infundi/ulforme	funnel shaped
Internode	section of stem between leaf bases or bracts.
Inverted	upside down.
Involute	opposite of revolute, curling inward.
Isthmus	narrow part of lip, or petal.
Keel	elongate protuberance.
Labellum	modified lip-like petal characteristic of orchids.
Lamina	blad
Laminar	flat sheet.
Lageniform	flask shaped.
Lamellate	made of thin plates.
Lanceolate	long narrowing to a point, used for leaves.
Lateral	to either side of midline.
Lax	loose.
Leaves	foliage excluding bracts.
Lentiginous	covered with fine spots.
Ligulate	strap shaped tongue-like structure.
Limb	branch.
Linear	Long-narrow.
Lineate	striated.
Lip	modified petal on ventral side of flower.
Lithophilic	growing on rock surfaces.
Lobe	a division of flower, leaf, or petal.
Lunate	crescent shaped, like falcate.

Maculate	spotted.
Marginal	at the edge.
Median	midline or center.
Mentum	chin like projection at base of lateral sepals.
Mesochile	middle portion of complex lip in Stanhopinidae.
Midlobe	center distal projection on a complex lip.
Monopodial	continued growth pattern of non-dividing stem.
Muricate	with many sharp points.
Mycorrhiza	fungal- root symbiosis.
Myrmecophyte	Living with ants, often symbiotic, hosting ants in hollow pseudobulbs or in roots.
Nectary	a gland that produces sugary liquid, usually in the flower.
Node	origin of leaf or bract.
Non resupinate	flower upside down with lip dorsal.
Oblique	asymmetrical, distorted on one side.
Obsolete	vestigial or indistinct structure.
Oblong	elongate with nearly parallel sides.
Oblanceolate	Oblong and lanceolate.
Obovate/Ovate	flat, egg shaped.
Ocreaceous	ochre colored- yellowish brown.
Orbicular	spherical
Ovate	egg shaped
Ovoid	three dimensional egg shape.
Panduriform	fiddle shaped rounded ends contracted center.
Paniculate	branched cluster of flowers which each branch is a raceme.
Papillose	wartlike, bumpy surface.
Parallel	side by side without touching as in longitudinal veins.
Patent	spreading.
Paucifloral	few flowered
peciolate	few flowered
Pedicel	basal stem of an individual flower.
Peduncle	stem supporting inflorescence.
Pendant/Pendulous	hanging.
Pergamineous	papery.
Petals	two unspecialized counterparts to the lip.
Petiole	Stem like basal portion of leaf.
Pilose	having fine hairs.
Pleated	possessing multiple longitudinal folds on leaf.
Plicate	folded like a fan.
Pollinium/ Pollinin	Structure containing pollen on anther, often detachable and adhesive to ride on pollinator.
Polystichous	Arranged in several rows.
Porrect	directed forward and down.
Procumbent	Prone, not upright.
Projecting	extending beyond apical margin.
Prostate	reposing on the ground.

Protruding	projecting.
Protuberance	a solid outgrowth.
Proximal	closer to the axis.
Pruinose	surface covered in white, frosted.
Pseudobulb	thickened aerial stem basal to leaves.
Pubescent	with soft downy hairs.
Punctate	dented or pitted.
Pyriform	pear shaped.
Quadrante	four sided with angular corners.
Raceme	Unbranched inflorescence in which flowers open in succession starting basally.
Rachis	central point of attachment of inflorescence above peduncle.
Reclining	leaning past vertical.
Recurved	s shaped, bowed back.
Reflexed	sharply curled back on itself, often in reference to leaves.
Reniform	kidney shaped, bilobed inflated.
Resupinate	flower upside down.
Retuse	notched broad apex.
Revolute	rolled downward from tip or margins.
Rhizome	a stem made up of the bases of successive shoots.
Rhombic	diamond shaped.
Robust	stout, short and heavy
Rostellum	a structure on the column.
Rostrum	beaklike projection.
Rosette	dense spiral leaf cluster typical of many terrestrial orchids.
Rugose	raised lines or wrinkles.
Saccate	shaped like a pouch.
Scabrous	rough surface.
Scarious	thin, dry, membranous
Scape	leafless flower stalk.
Scarious	dry, papery.
Sepals	outer three segments of orchid flower.
Serrate	saw edged.
Sessile	without stalk.
Setaceous	bristly.
Sheath	a leaf-like or fibrous structure enclosing young pseudobulbs.
Shoot	new growth on existing plant.
Solitary	occurring singly.
Spathe	sheath covering inflorescence.
Spatulate	widening to a large wide apex.
Spiculate	having fine fleshy points.
Species	one or more interbreeding populations.
Spike	unbranched inflorescence with young apical flowers.
Spur	slender saclike structure formed by lip of some flowers, see. Galeandra.
Stem	woody column including rhizome, peduncle, rachis.

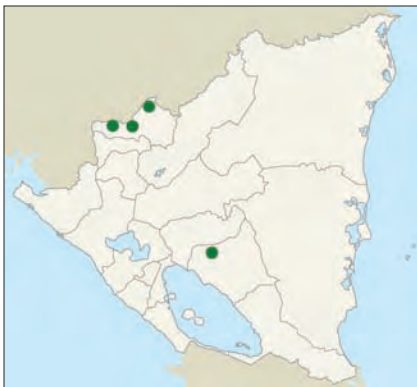
Stigma	sticky end of pistil.
Stipe	stalked part of pollinia.
Stipate	pressed together
Striate	with parallel lines.
Strigose	covered with stiff flat hairs.
Stippled	with many, fine, colored dots.
Successive	one following another
Sub	prefix meaning “almost”.
Sulcate / surcate	with grooves or furrows.
Sympodial	branching, growth from multiple shoots.
Taxon	a group of organisms of the same rank, e.g. family, genus, species etc.
Teeth	series of sharp points on edge.
Terete	tube-like, cylindrical.
Terminal	at the apex.
Terrestrial	growing on the ground.
Throat	tube-like portion if some lips eg, Guarianthe, Brassavola.
Tridentate	having three tooth like structures next to each other.
Trifid	three lobed.
Trifoliate	three leafed.
Trifurcate	three forked.
Tripartite	divided in to three parts
Truncate	abrupt shortened wide apex.
Tuberculate	with knobby projections.
Umbellate/Umbelliform	densely clustered flowers forming a flat rounded inflorescence.
Unguiculate	with claw like extension.
Unifoliate	single leaved.
Uninerved	possessing a nerve.
Variegated	having various color forms.
Vein	an externally visible strand of vascular tissue.
Ventral	Lower (lip) side of the flower.
Verrucose	warty
Whorl	arranged in circular pattern.
Wings	extensions of the lip.
Xerophyte	adapted to arid conditions.

ORCHIDS OF NICARAGUA

PHOTOS & LOCATION MAPS

- Authors Observed Field Records
- Literature Reports or Records prior to 1980 (remain to be confirmed)

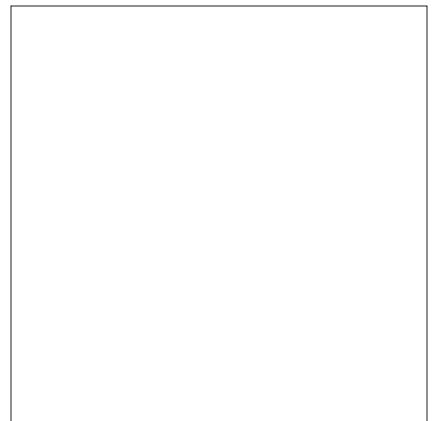
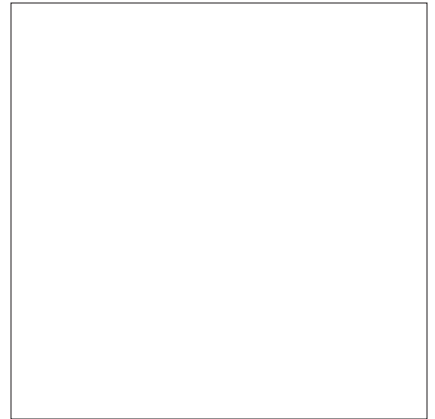
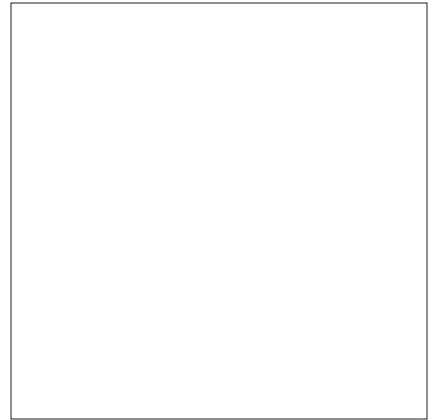
Acianthera circumplexa



Acianthera cogniauxiana



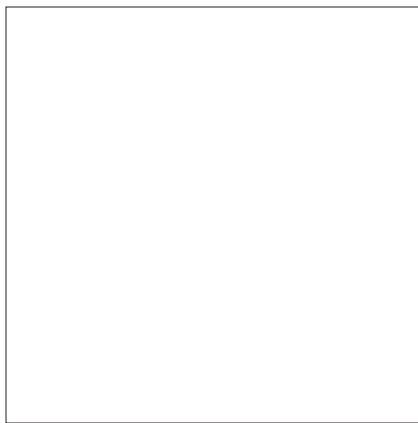
Acianthera hondurensis



Acianthera pantasmi



Acianthera pubescens



Ada chlorops



Arpophyllum alpinum



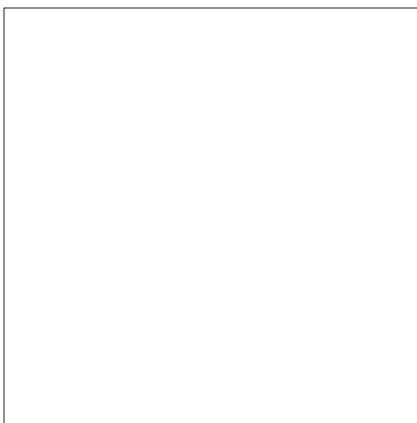
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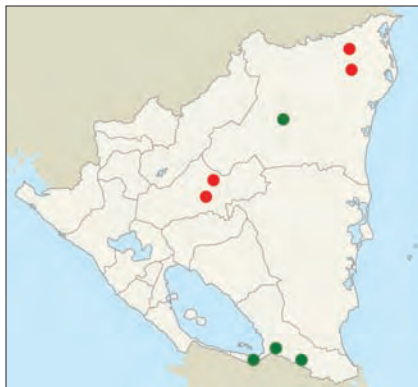
Arpophyllum spicatum



Arundina graminifolia



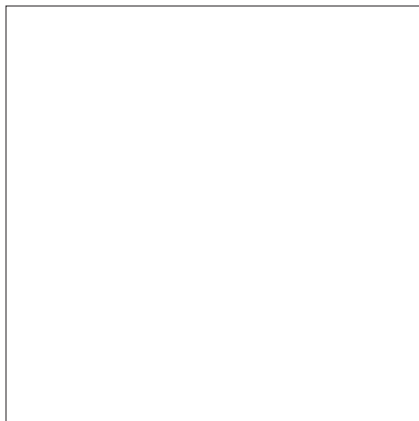
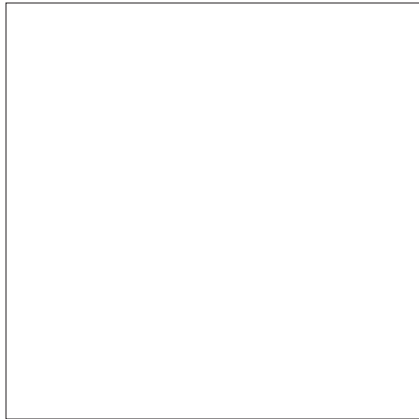
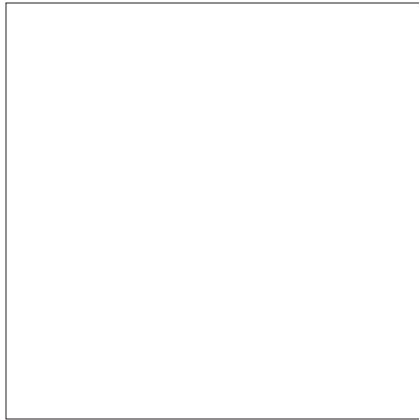
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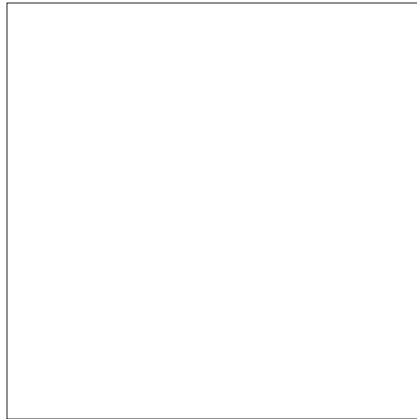
Aspasia principissa



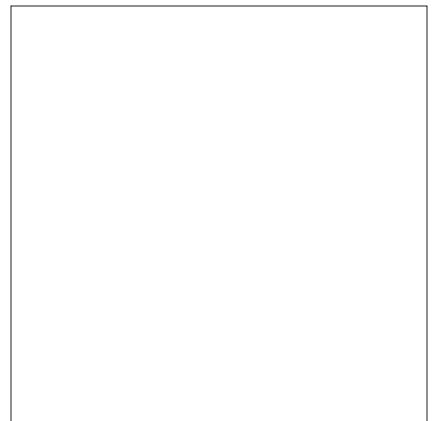
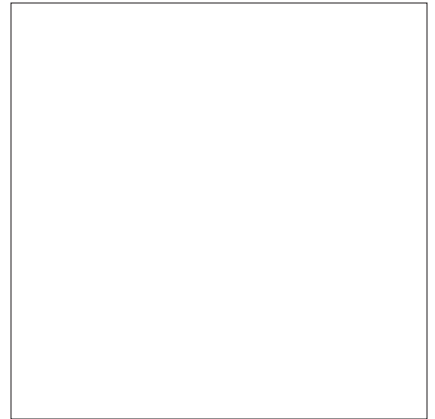
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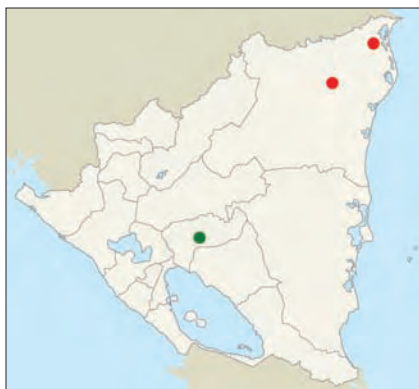
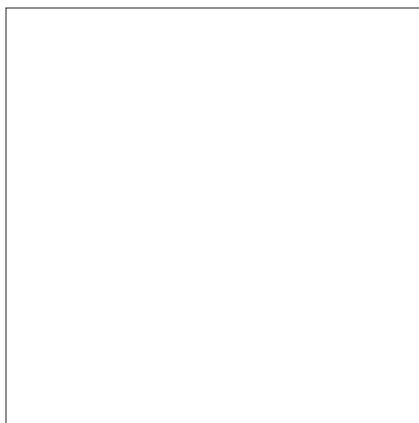
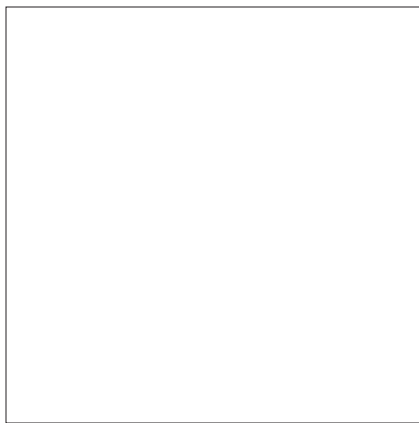
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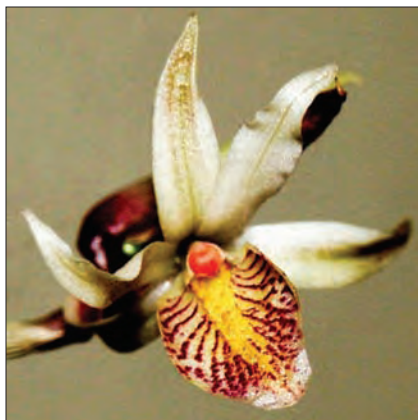
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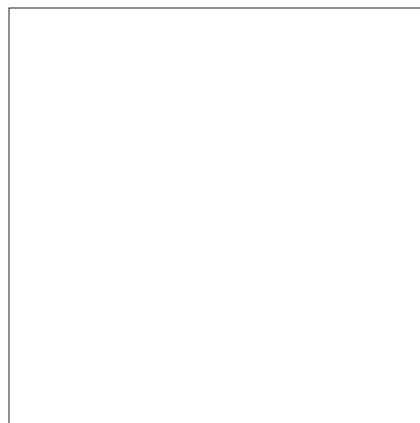
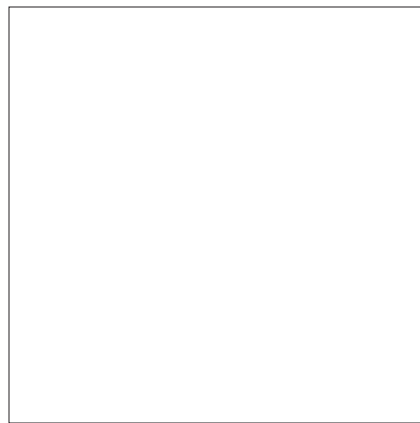
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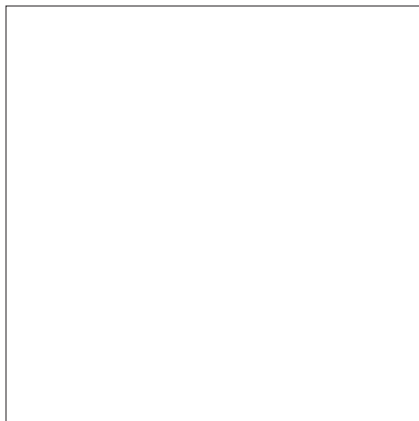
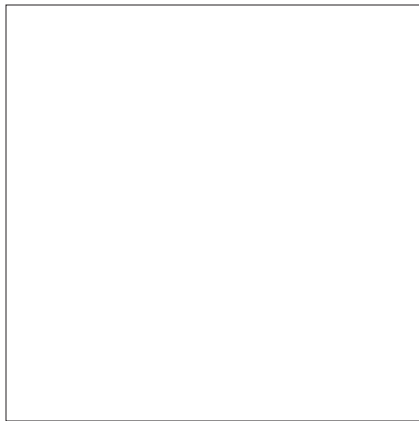
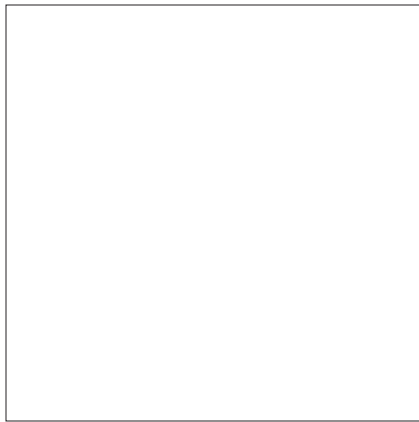
Barkeria obovata



Barkeria spectabilis



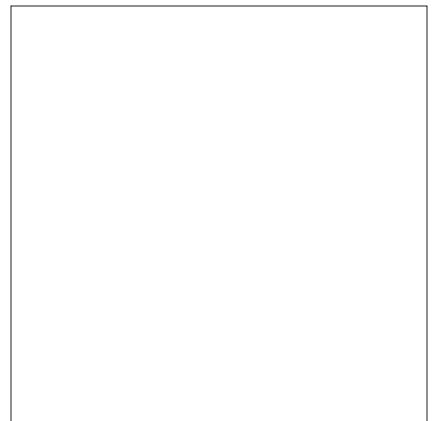
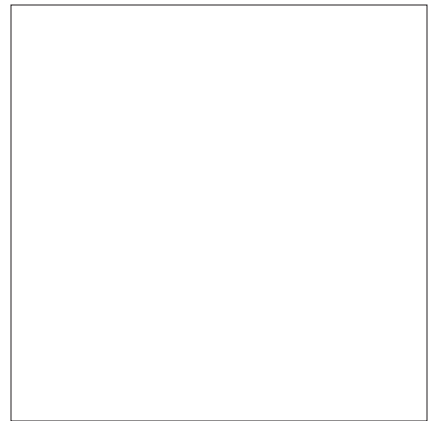
Baskervilla colombiana



Beloglottis costaricensis



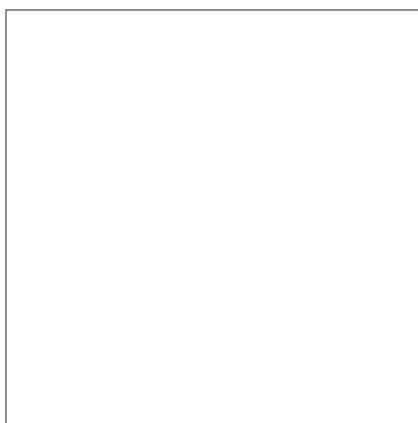
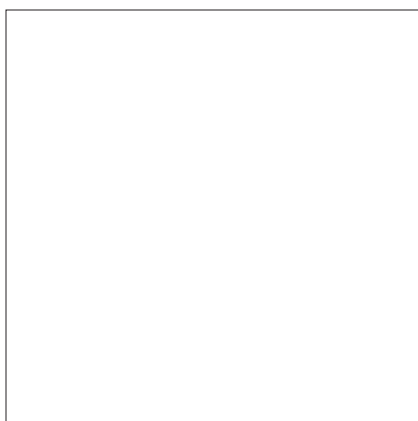
Beloglottis hameri



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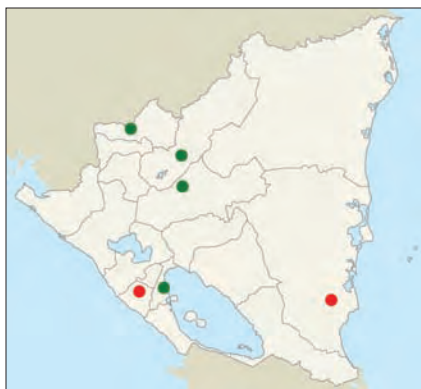
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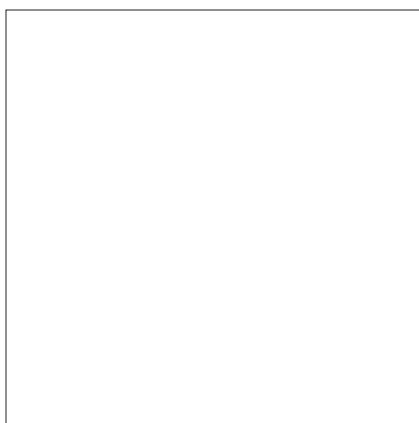
Bletia purpurata



Bletia purpurea



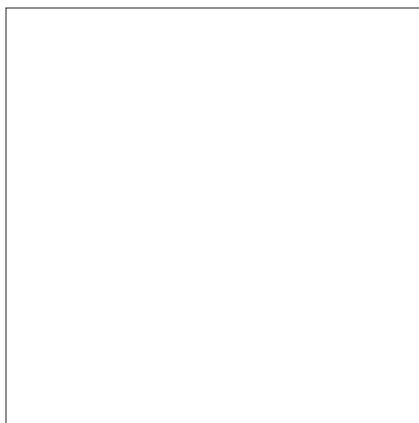
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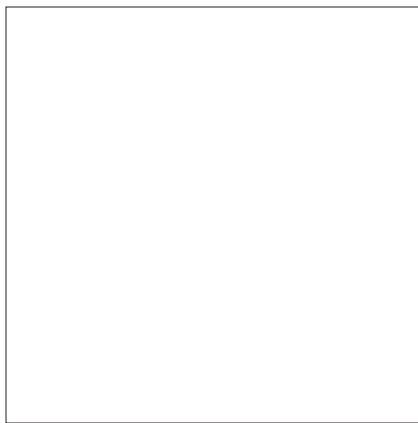
Bletia roezlii



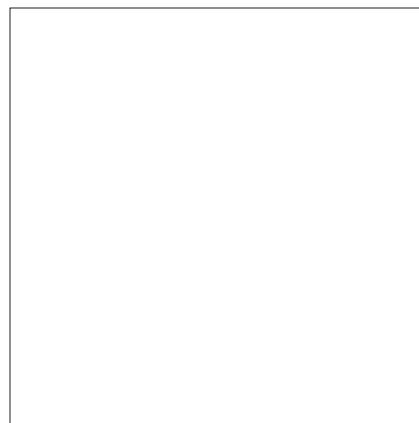
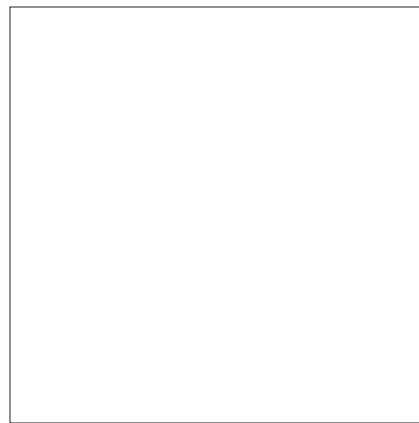
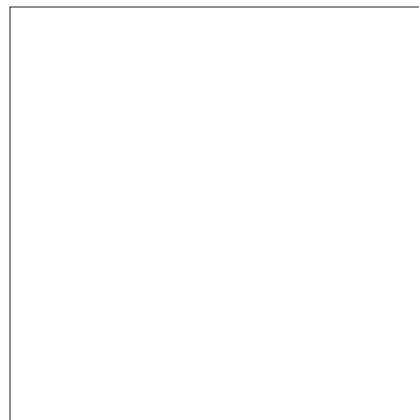
Brachiomidium folsomii



Brachionidium valerioi



Brachystele guayanensis



Brassavola cucullata



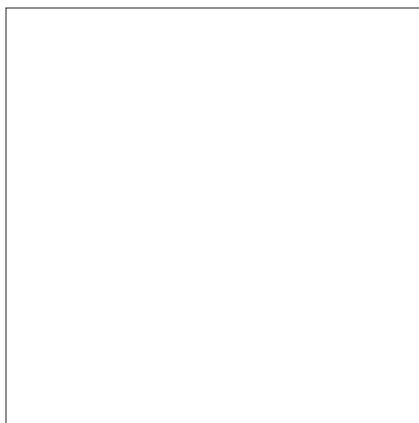
Brassavola grandiflora



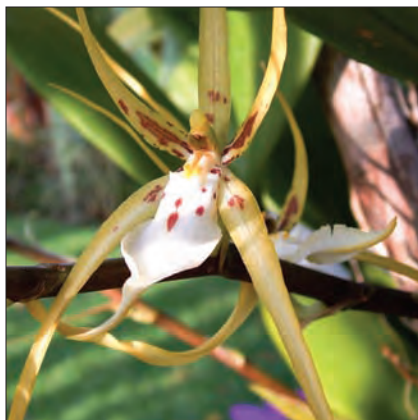
Brassavola nodosa



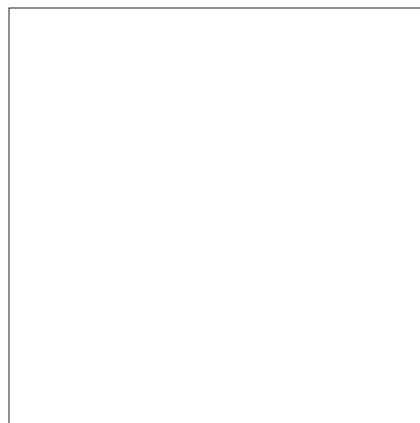
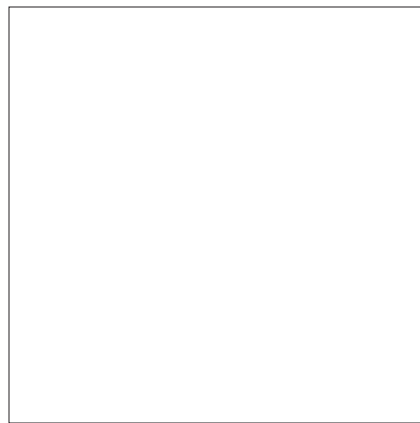
Brassavola venosa



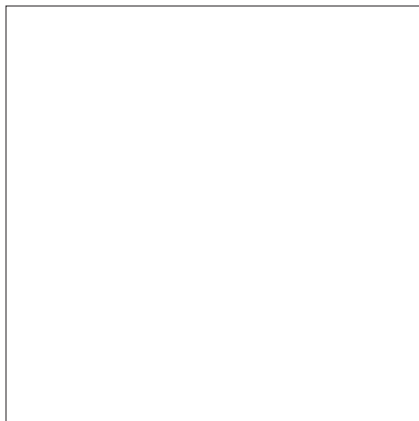
Brassia caudata



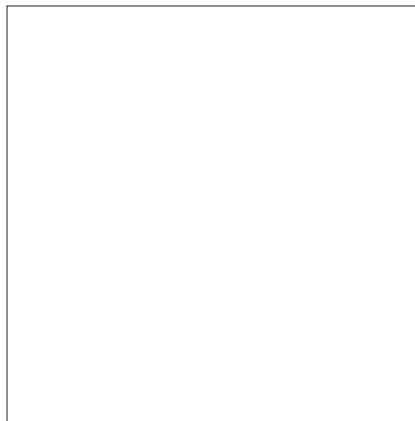
Brassia gireoudiana



Brassia maculata



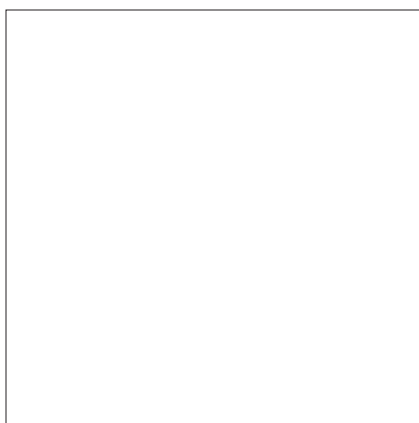
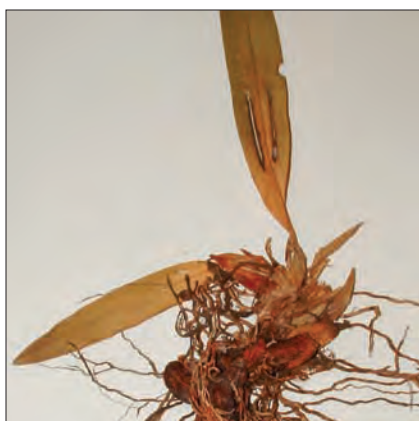
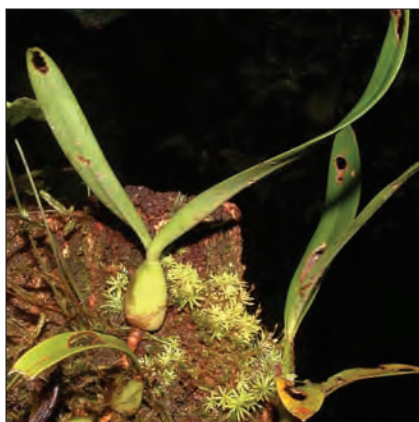
Brassia signata



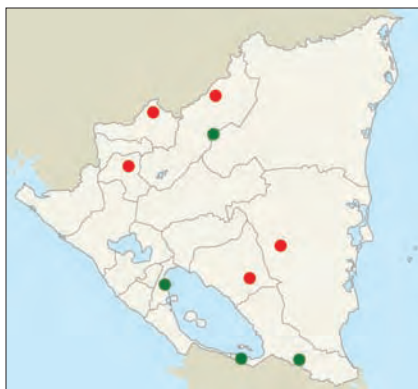
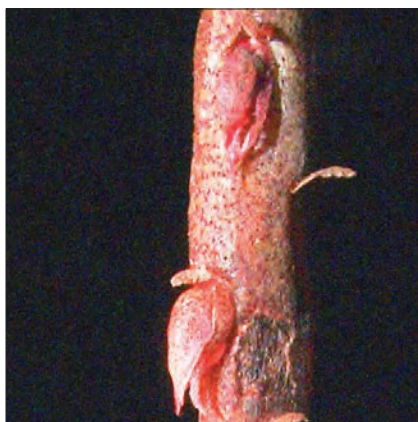
Brassia verrucosa



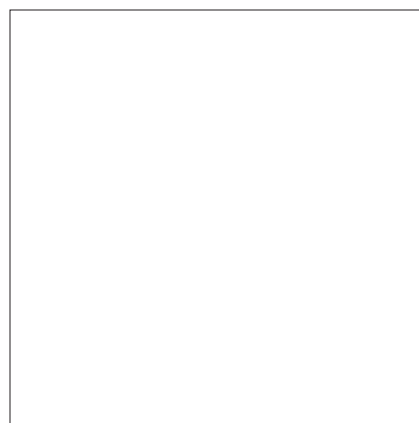
Bulbophyllum aristatum



Bulbophyllum pachyrachis



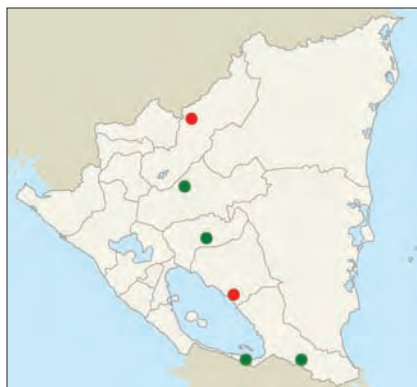
Calanthes calanthoides



Campylocentrum fasciola



Campylocentrum micranthum



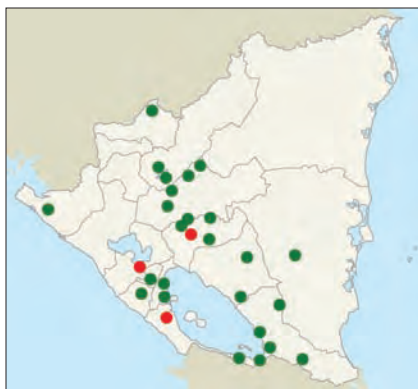
Campylocentrum schiedei



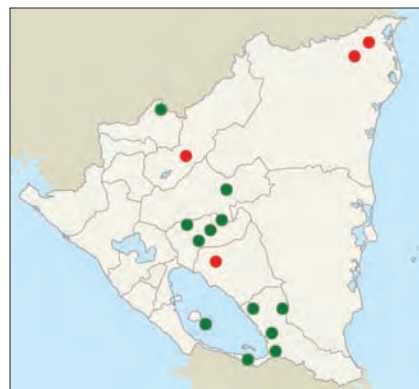
Catasetum integerrimum



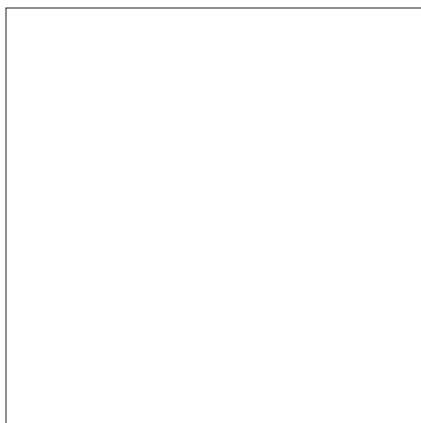
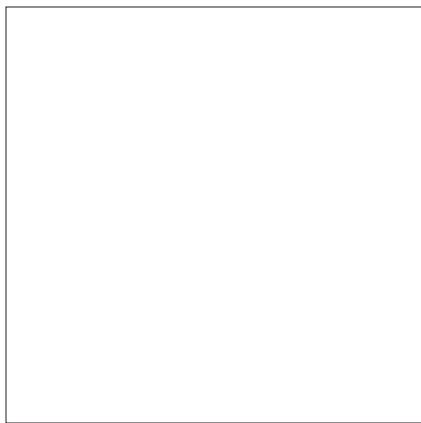
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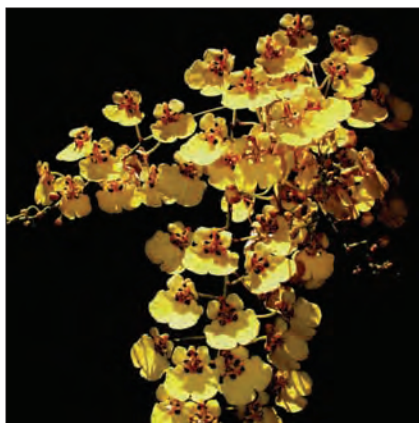
Caularthron bilamellatum



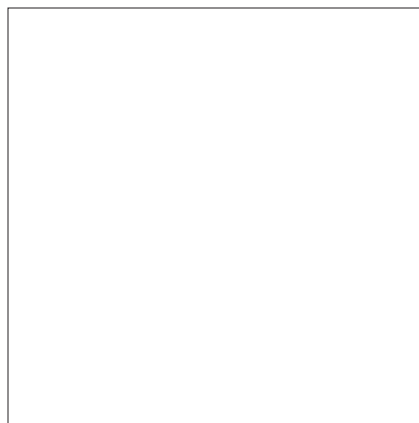
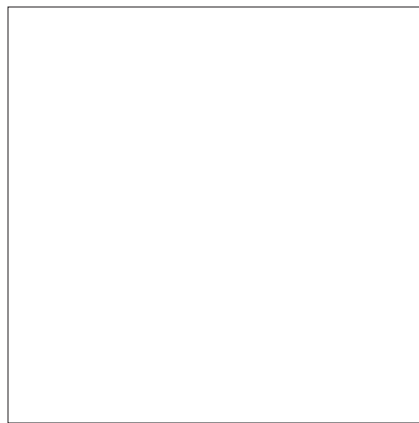
Chaubardiella subquadrata



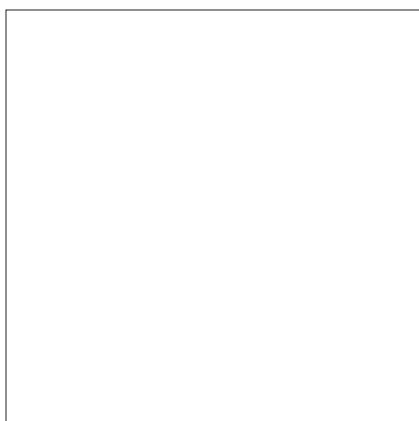
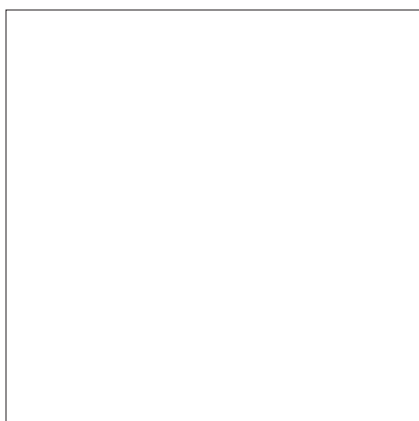
Chelyorchis ampliata



Chysis bractencens



Chysis bruennowiana



Chysis laevis



Chysis tricostata



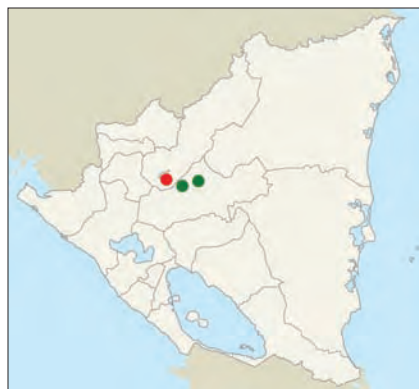
Clowesia russelliana



Coccineorchis standleyi



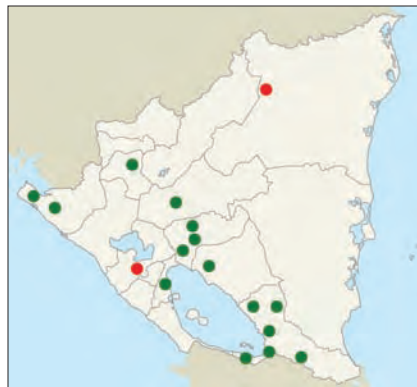
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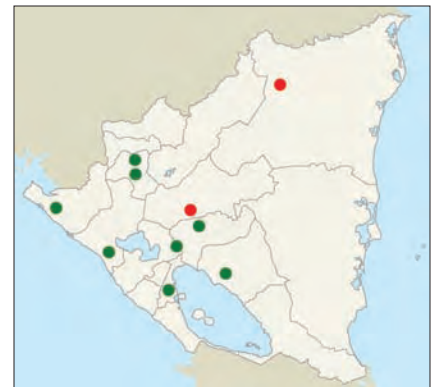
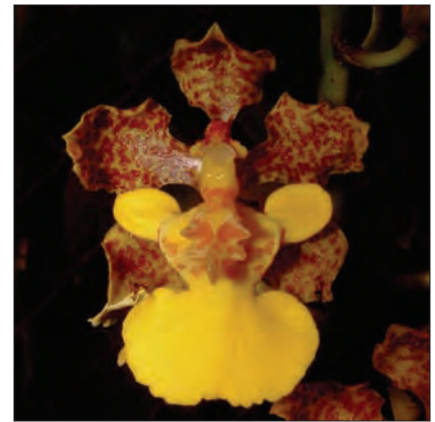
Coelia macrostachya



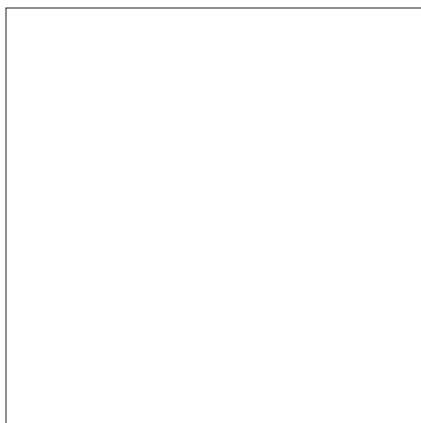
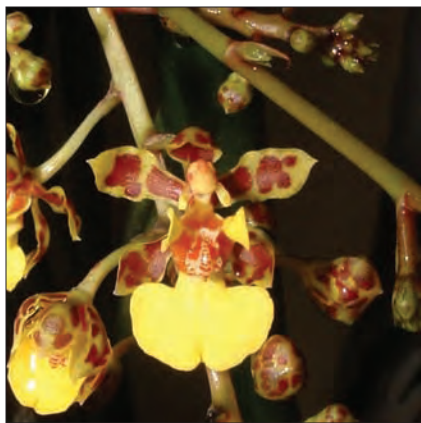
Cobniella ascendens



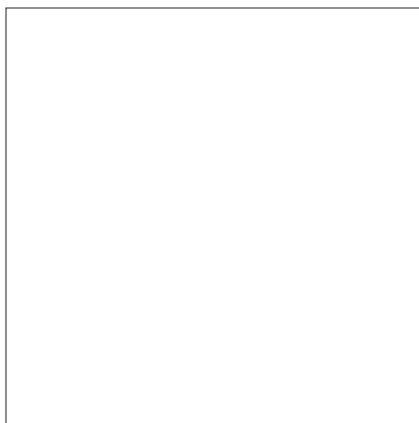
Cobniella cebolleta



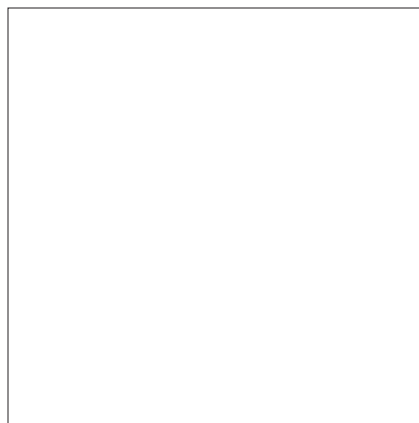
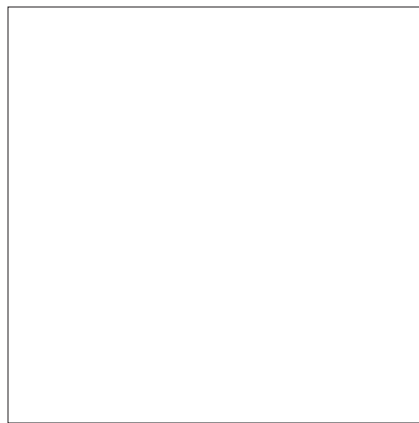
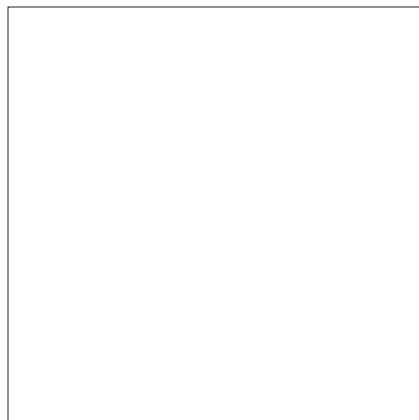
Cobniella stipitata



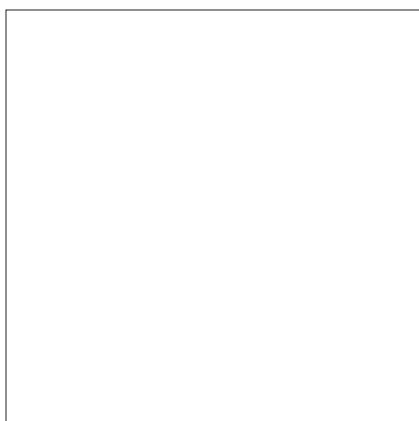
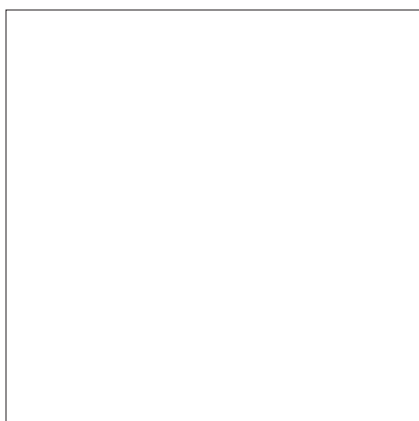
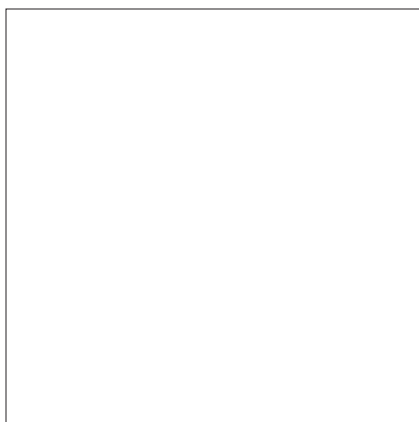
Comparettia falcata



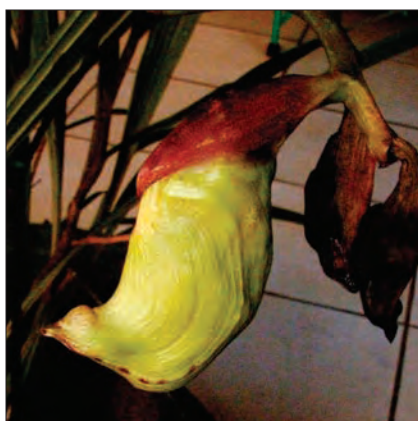
Corallorhiza bulbosa



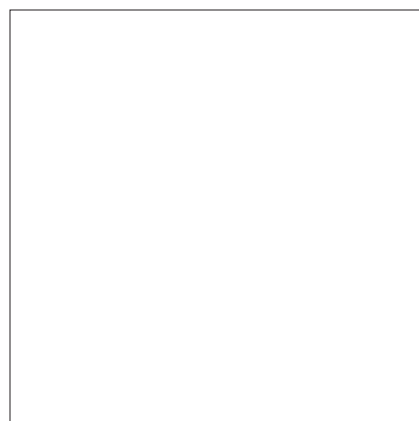
Corallorhiza odontorhiza



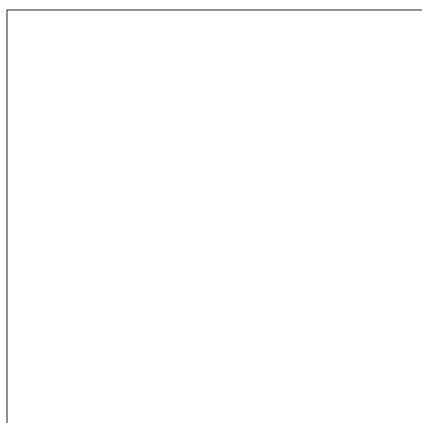
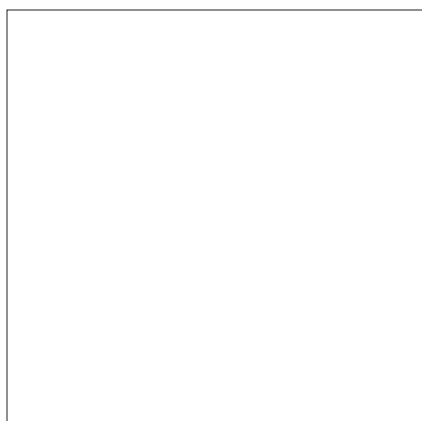
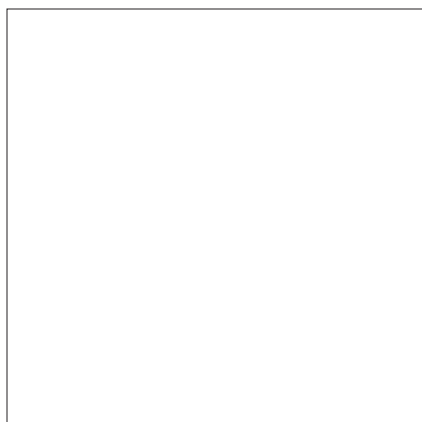
Coryanthes gracilis



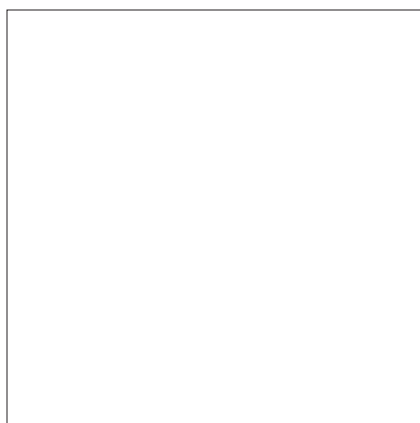
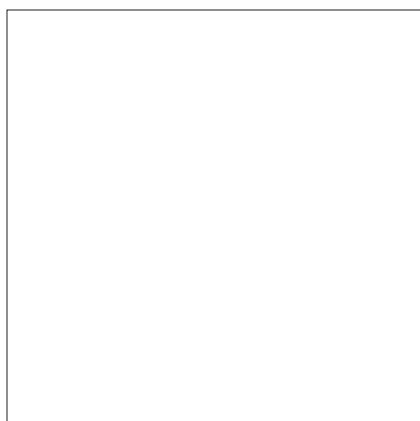
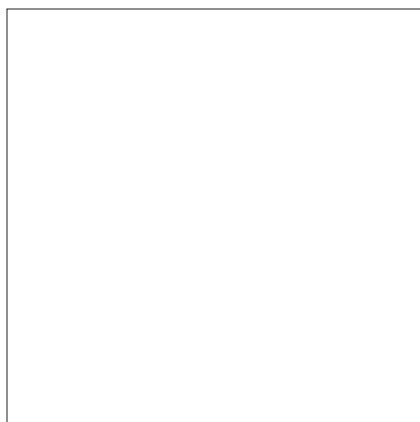
Corymborkis forcipigera



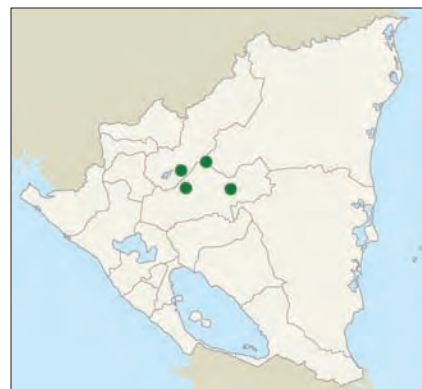
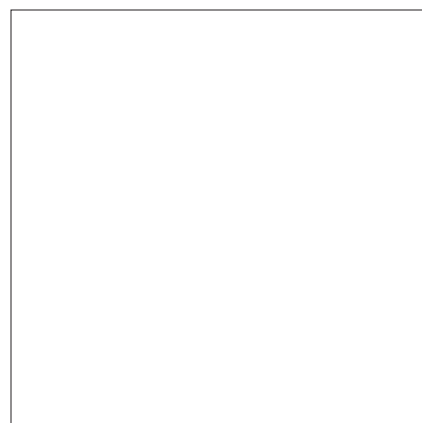
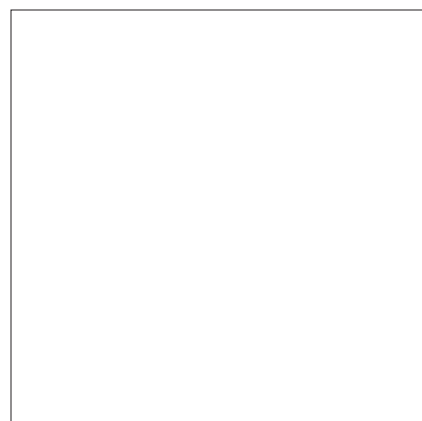
Cranichis ciliata



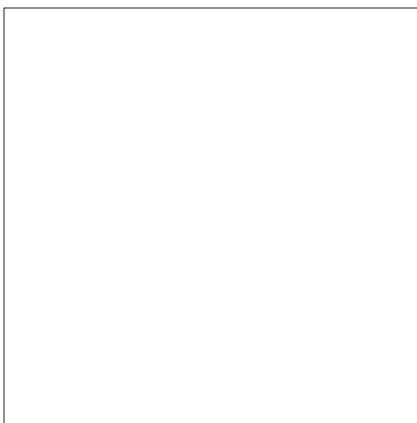
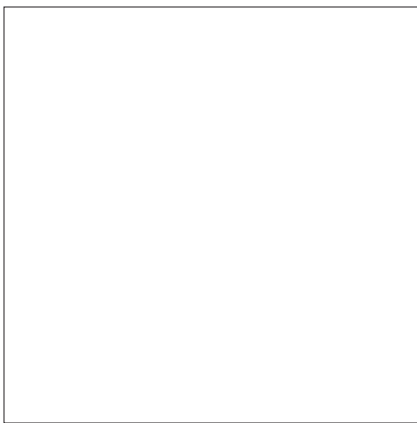
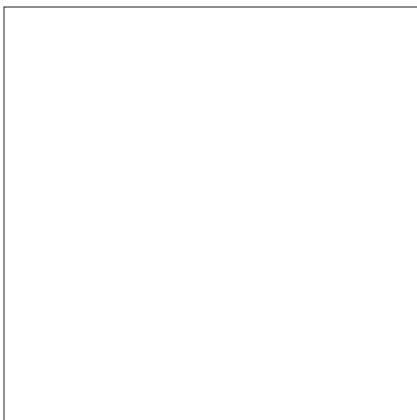
Cranichis diphylla



Cranichis revoluta



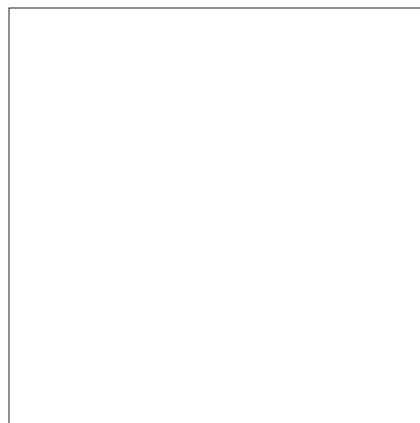
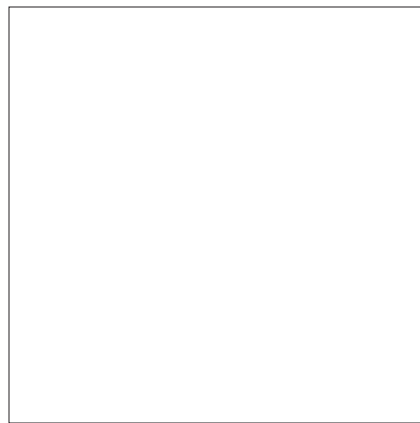
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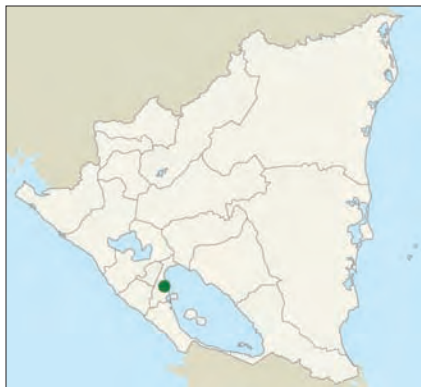
Cranichis wagneri



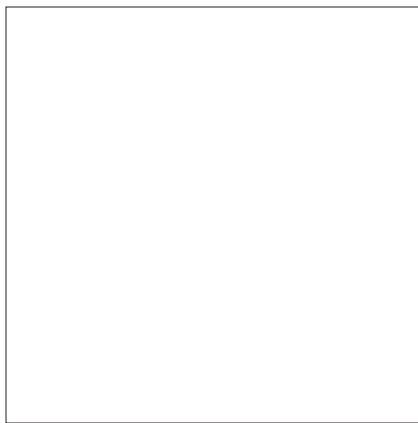
Crossoglossa fratum



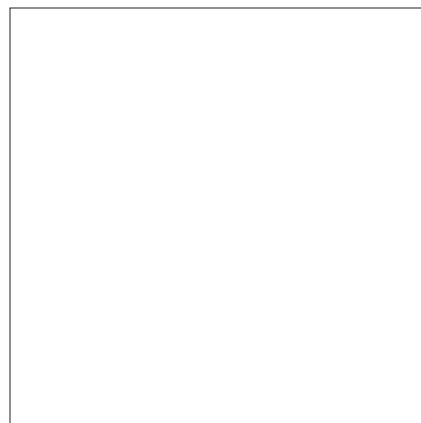
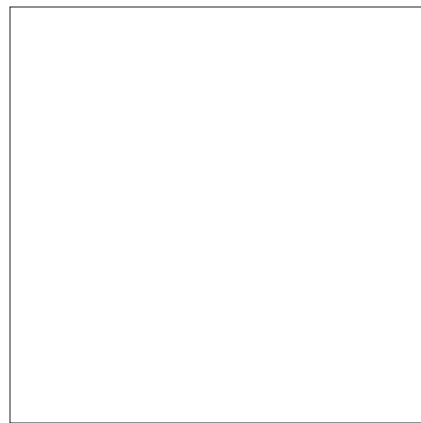
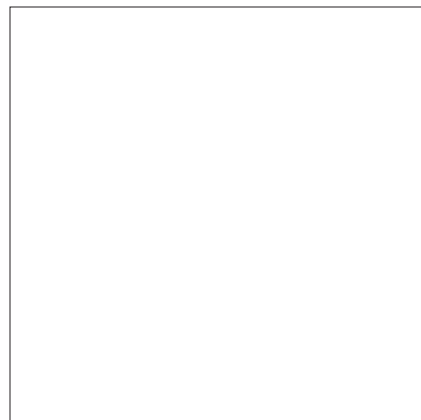
Crossoglossa tipuloides



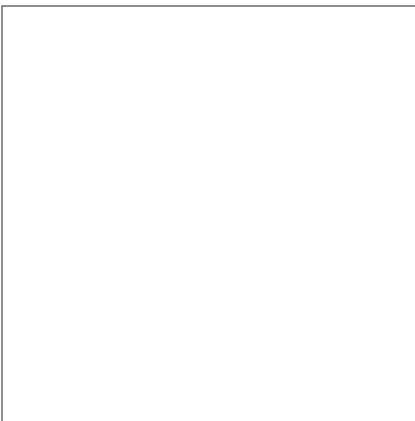
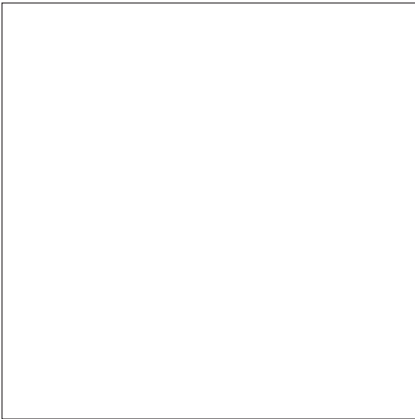
Cryptarrhena lunata



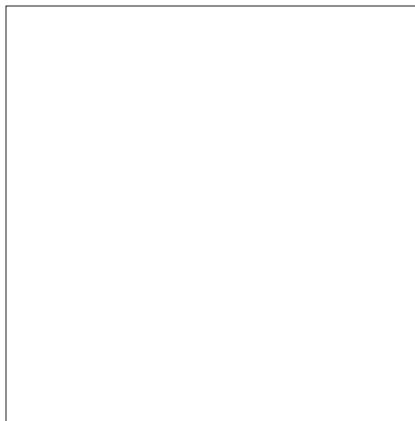
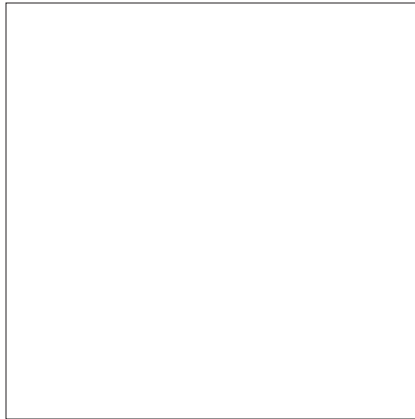
Cryptarrhena quadricornuta



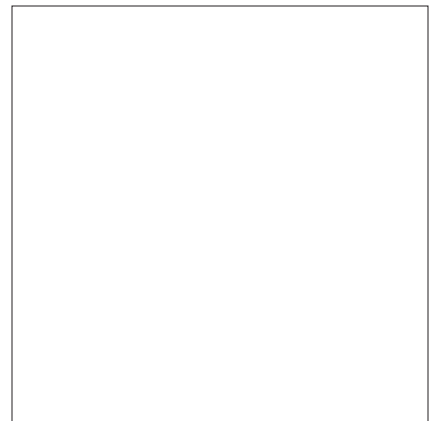
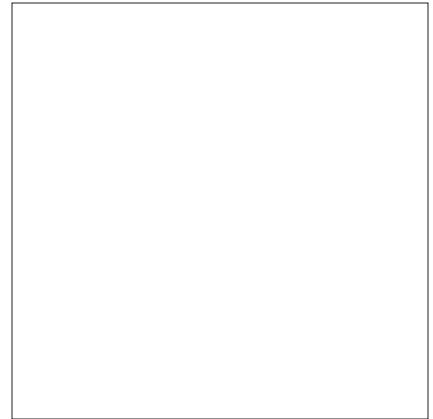
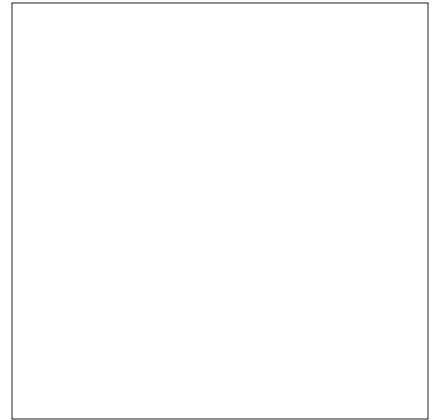
Cryptocentrum latifolium



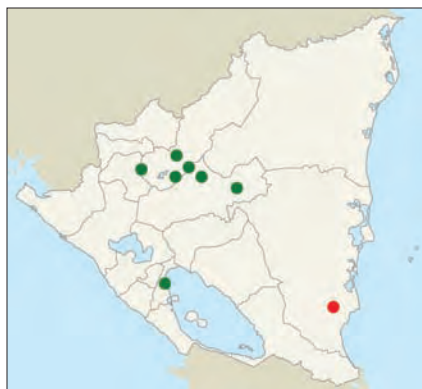
Cuitlauzina pulchella



Cychnoches pachydactylon



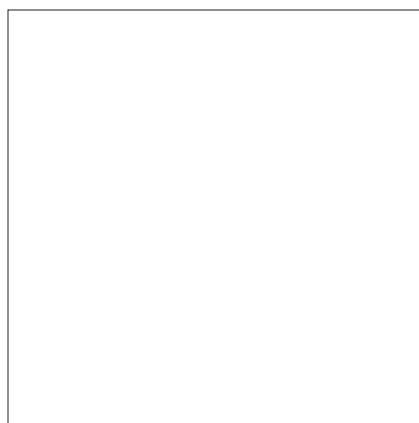
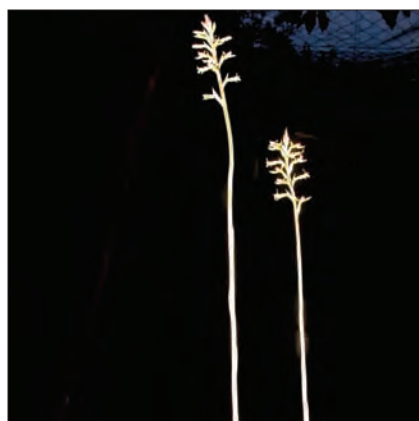
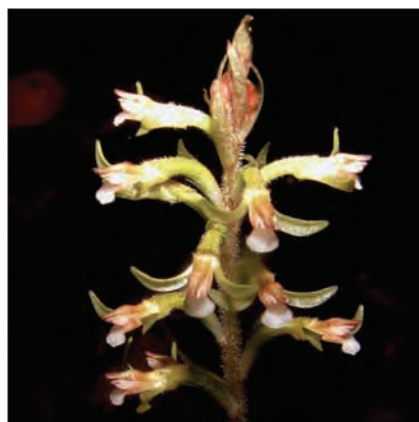
Cyclopogon comosa



Cyclopogon cranichioides



Cyclopogon elatus



Cyclopogon miradorensis



Cyclopogon obliquus



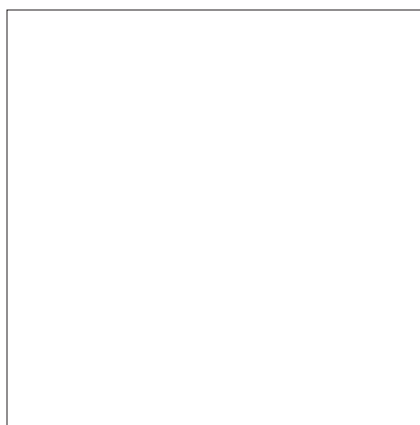
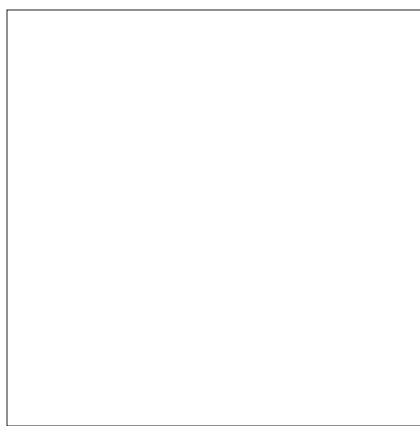
Cyclopogon prasophyllus



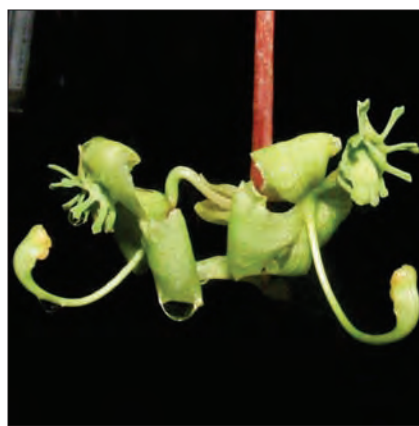
Cycnoches egertonianum



Cycnoches guttulatum



Cycnoches stenodactylon



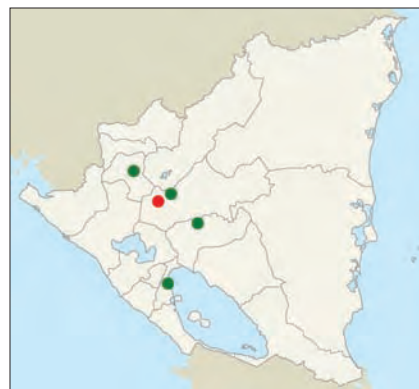
Cycnoches ventricosum



Cyrtopodium macrobulbon



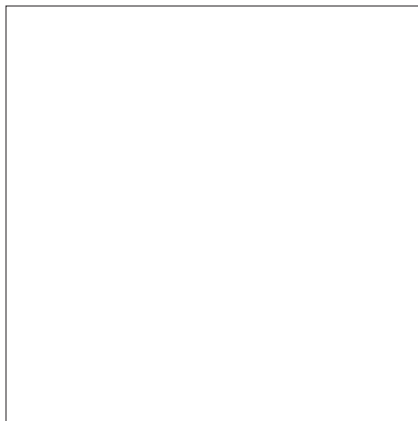
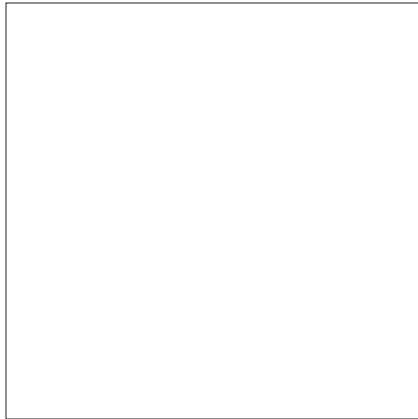
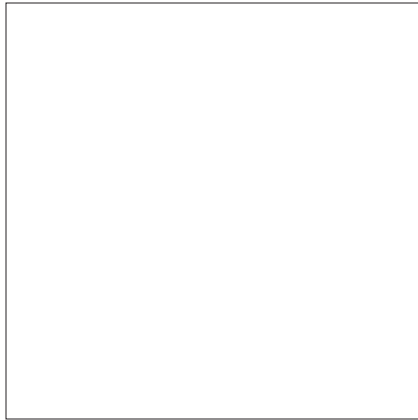
Deiregyne hemichrea



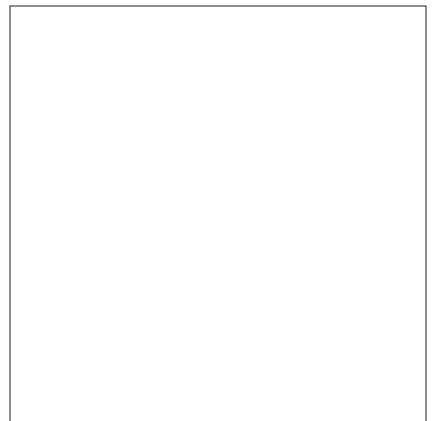
Dichaea brachypoda



Dichaea dammeriana



Dichaea fragrantissima ssp
eburnea



Dichaea glauca



Dichaea graminoides



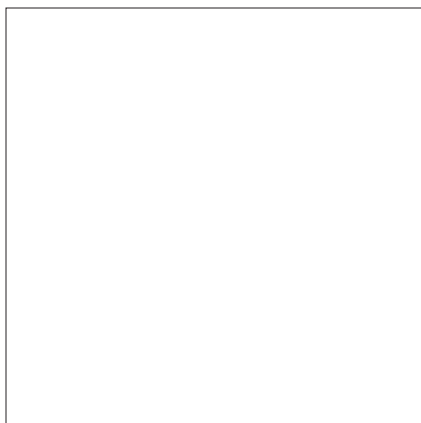
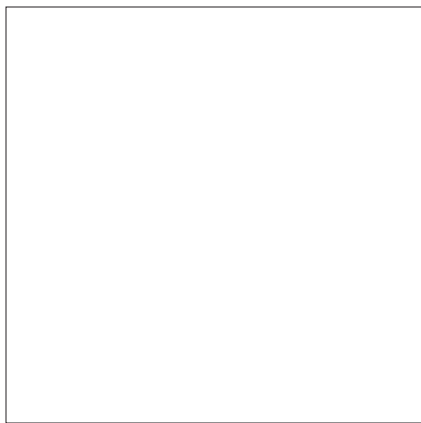
Dichaea hystericina



Dichaea morrisii



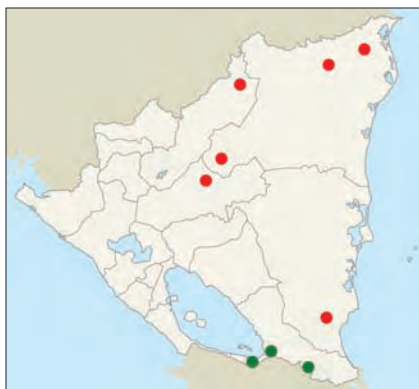
Dichaea muricatoides



Dichaea neglecta



Dichaea panamensis



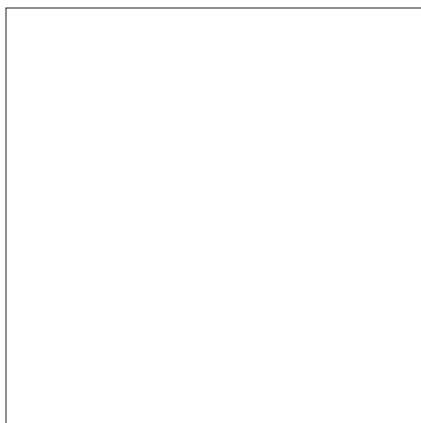
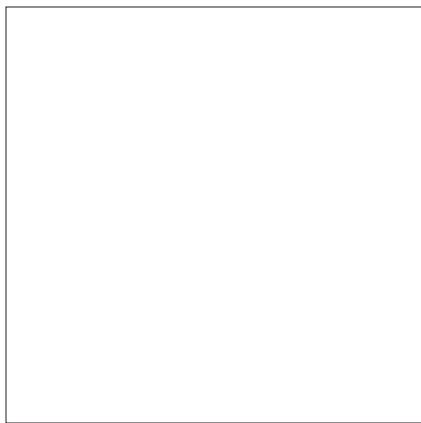
Dichaea pendula



Dichaea poicillantha



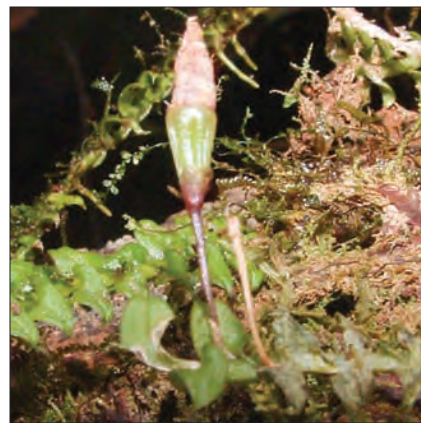
Dichaea trichocarpa



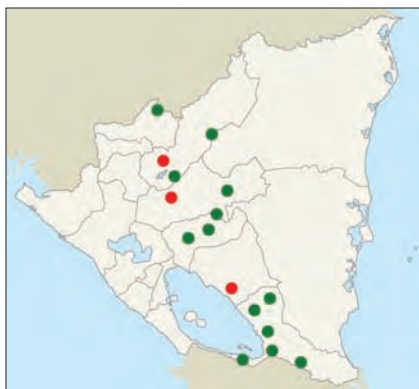
Dichaea trulla



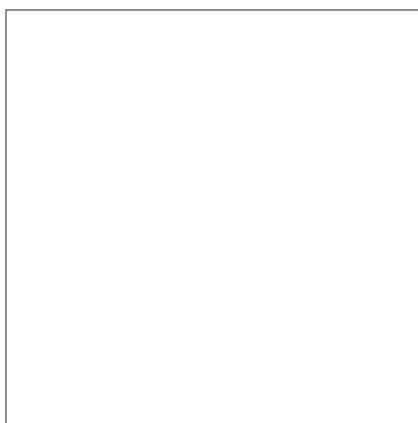
Dichaea tuerckheimii



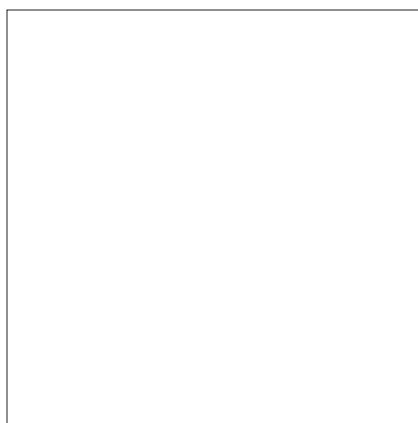
Dimerandra emarginata



Dimerandra lamellata



Dimerandra latipetala



Dinema polybulbon



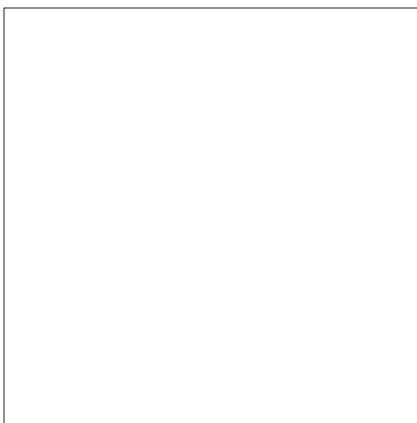
Domingoa purpurea



Dracula pusilla



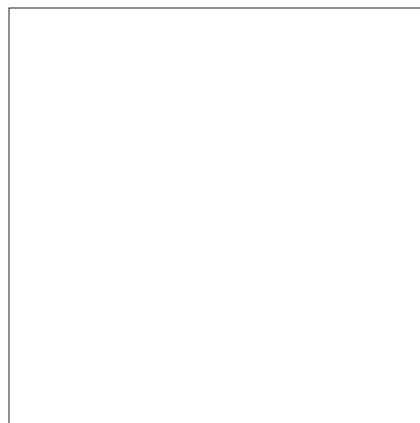
Dracula vespertilo



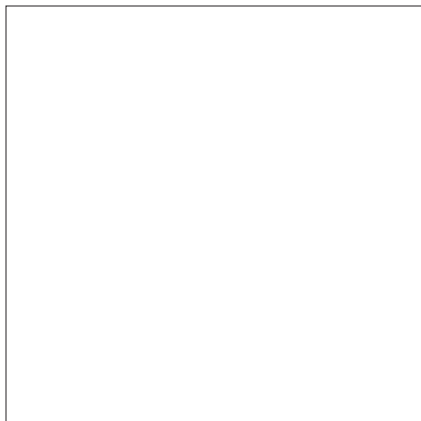
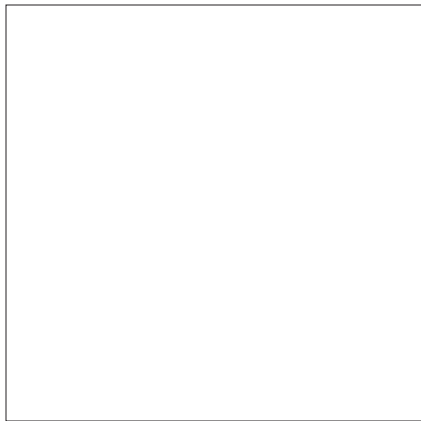
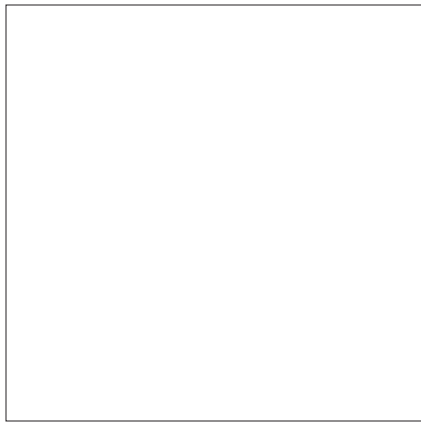
Dresslerella hispida



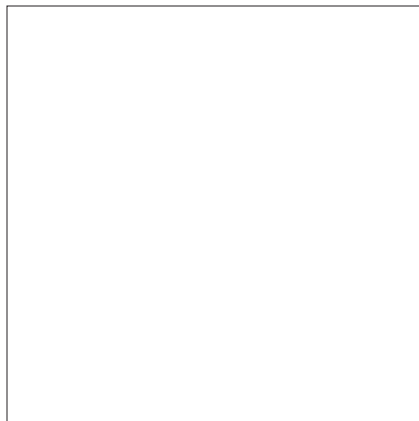
Dressleria dilecta



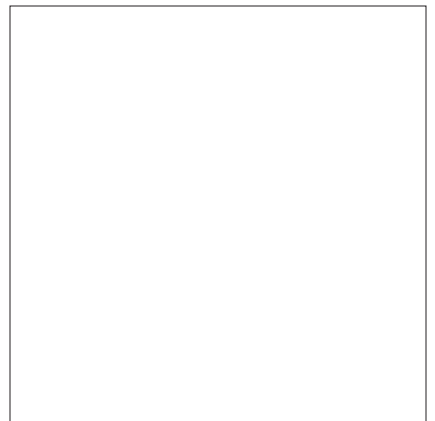
Dressleria eburnea



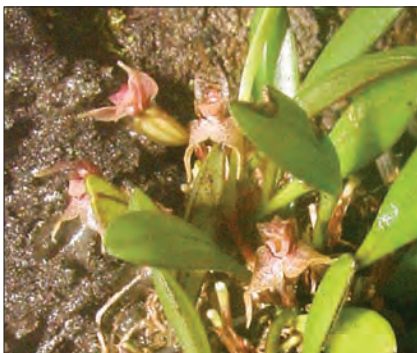
Dressleria helleri



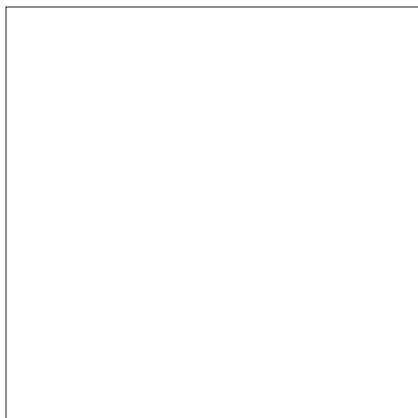
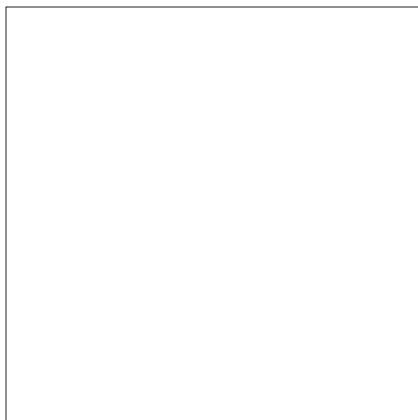
Dryadella guatemalensis



Dryadella simula



Echinosepala lappiformis



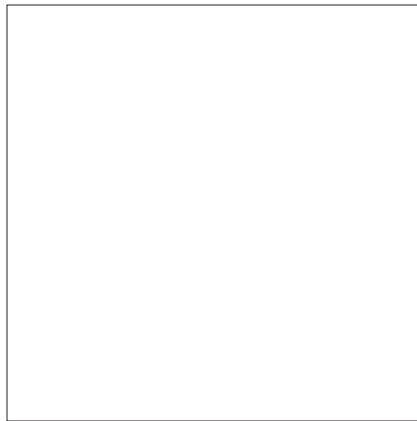
Echinosepala uncinata



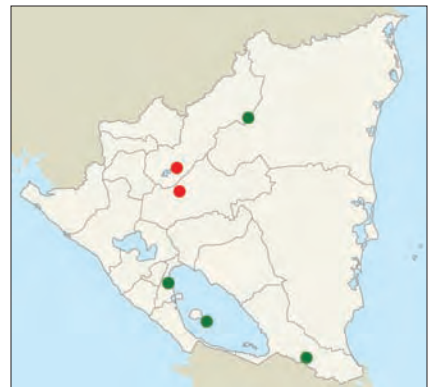
Elleanthus alberti



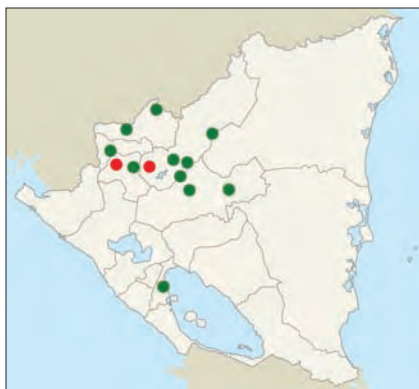
Elleanthus aurantiacus



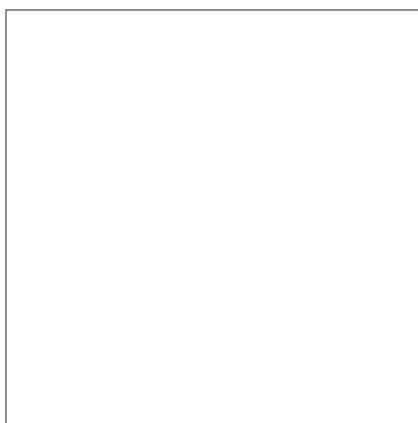
Elleanthus caricoides



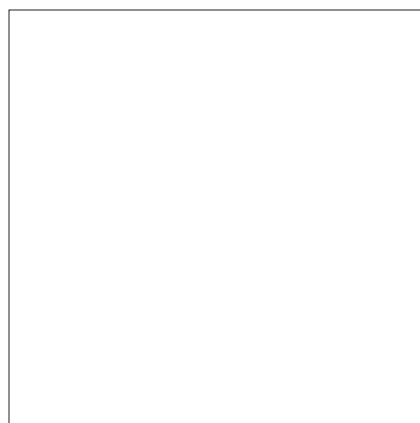
Elleanthus cynarocephalus



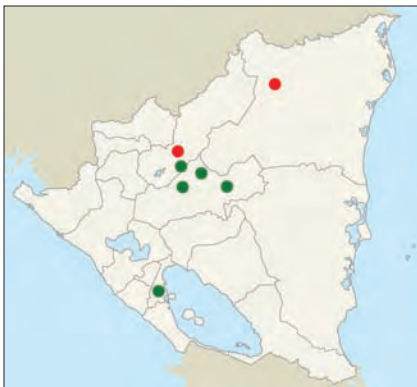
Elleanthus discolor



Elleanthus hymenophorus



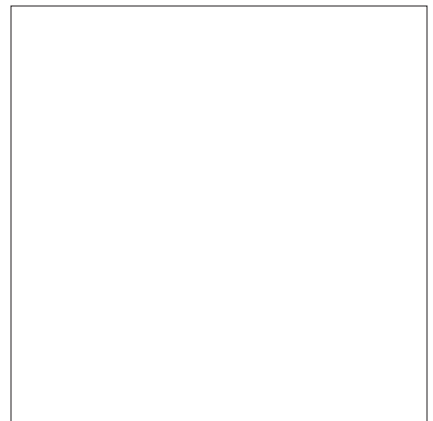
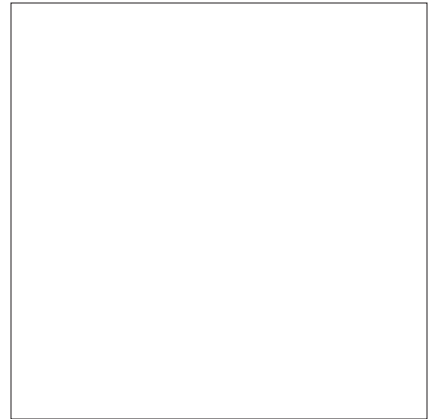
Elleanthus poiformis



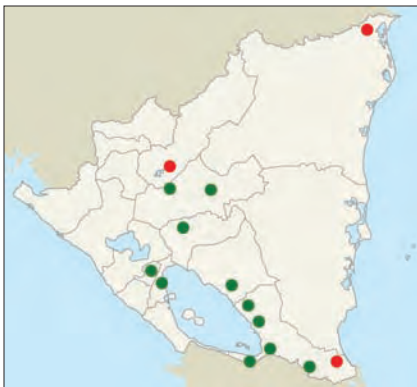
Elleanthus tonduzii



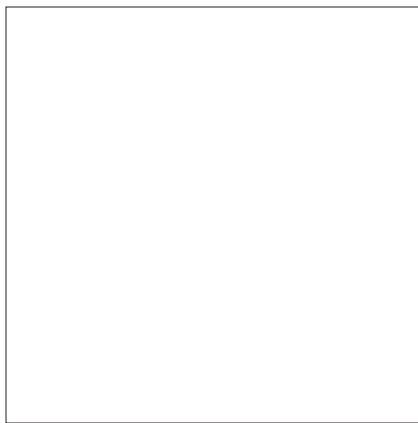
Elleanthus wercklei



Encyclia alata



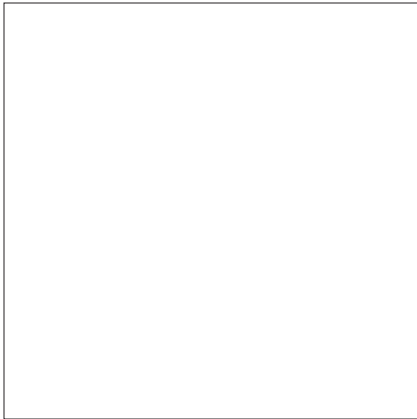
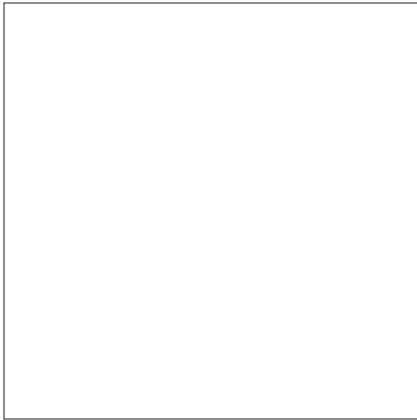
Encyclia amanda



Encyclia ambigua



Encyclia belizensis



Encyclia ceratistes



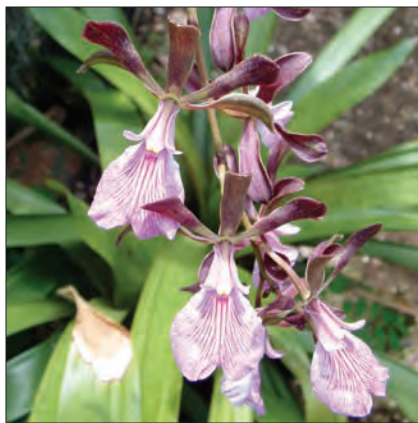
Encyclia chiapasensis



Encyclia cordigera



Encyclia cordigera roseum



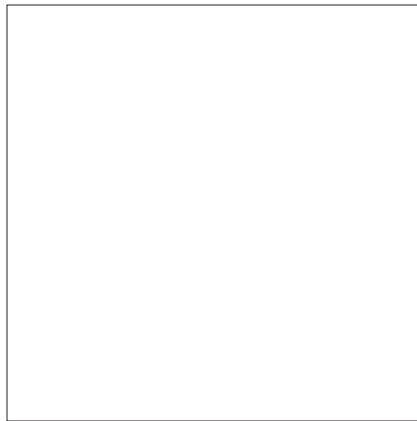
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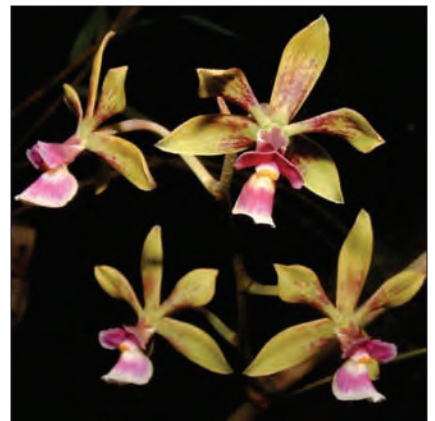
Encyclia gravida



Encyclia guatemalensis



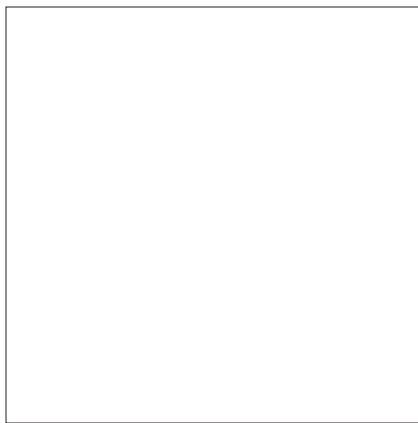
Encyclia mooreana



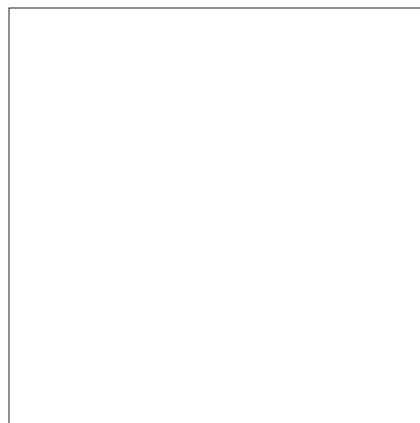
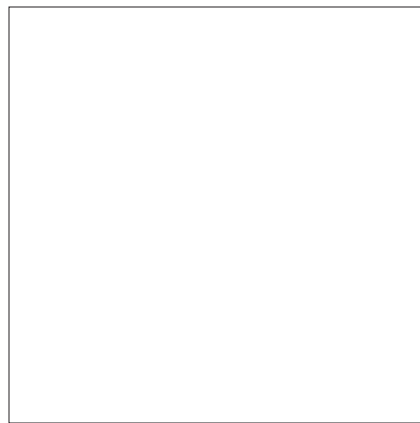
Encyclia papillosa



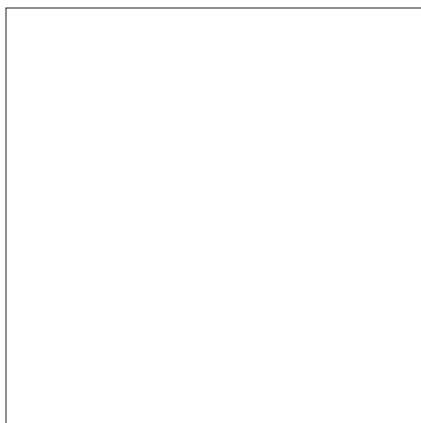
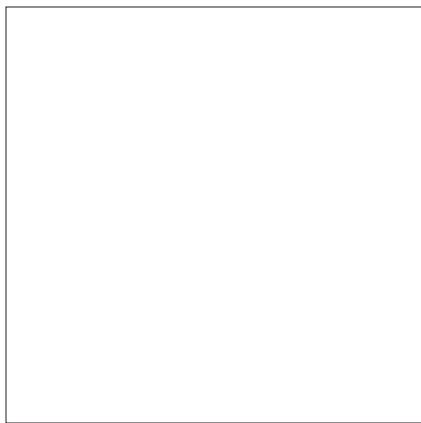
Encyclia selligera



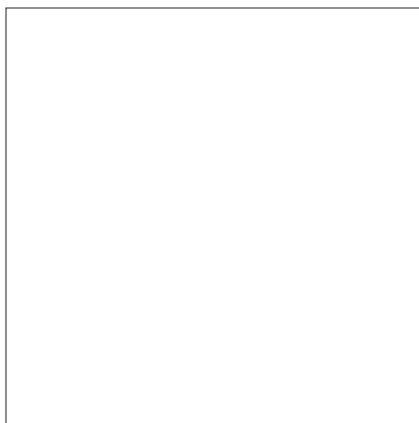
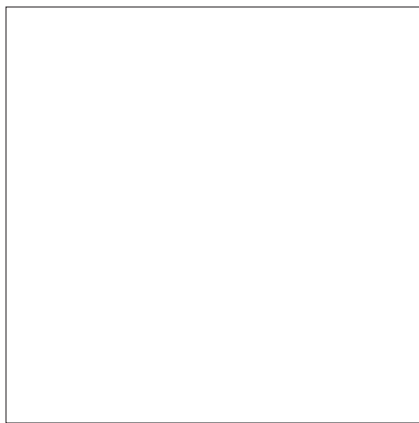
Encyclia suaveolens



Encyclia trachycarpa



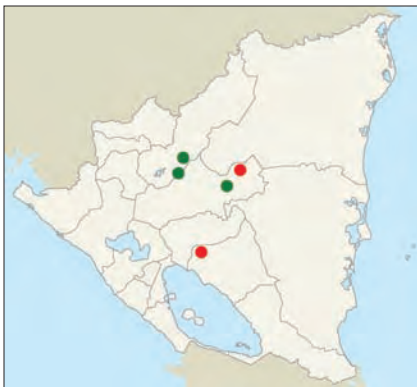
Epidendrum acunae



Epidendrum alabastrinum



Epidendrum anceps



Epidendrum angustisegmentum



Epidendrum arbuscula



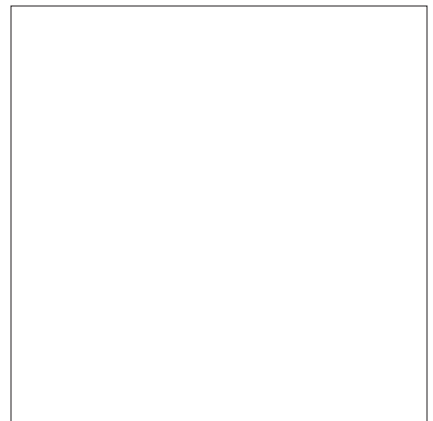
Epidendrum barbeyanum



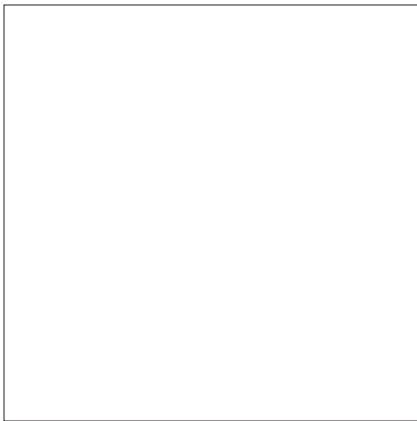
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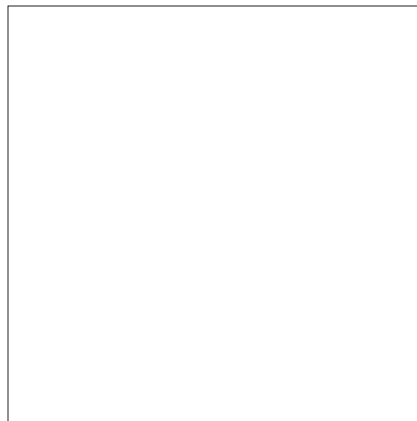
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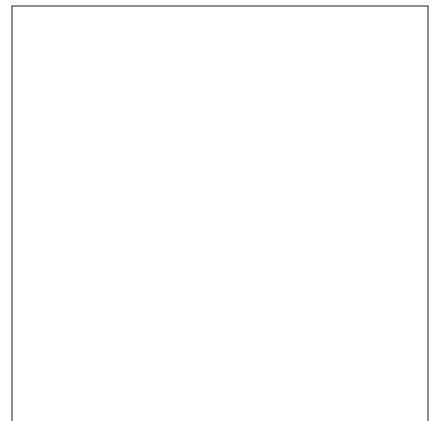
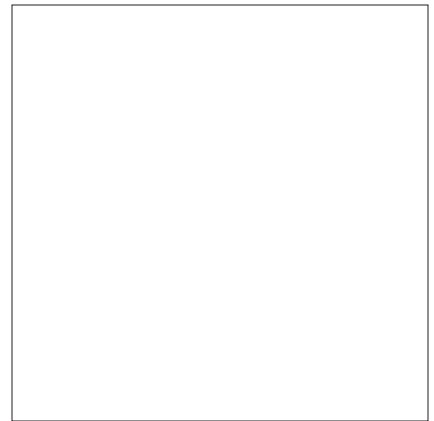
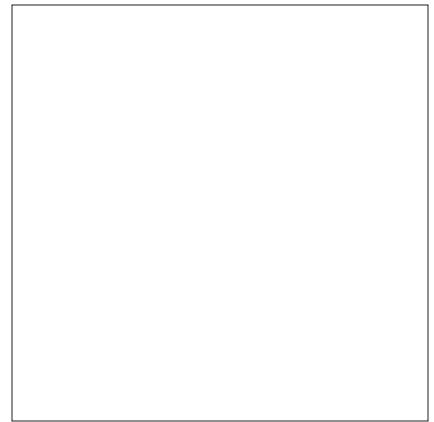
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Epidendrum caroli



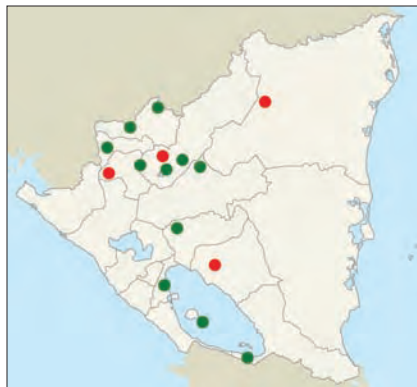
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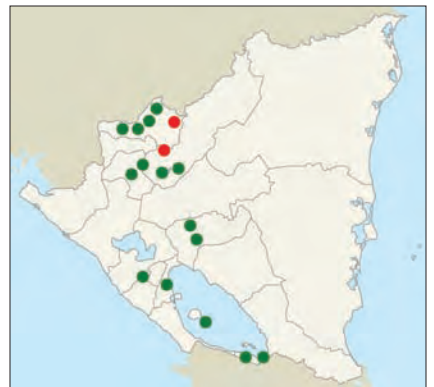
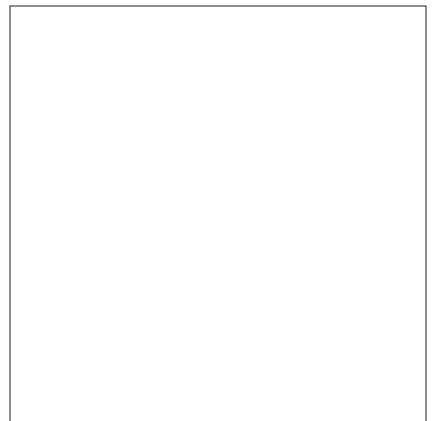
Epidendrum chloe



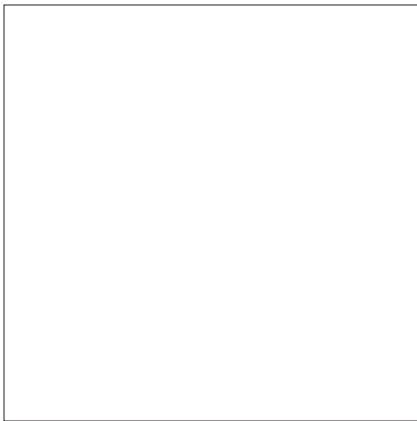
Epidendrum chlorycorymbos



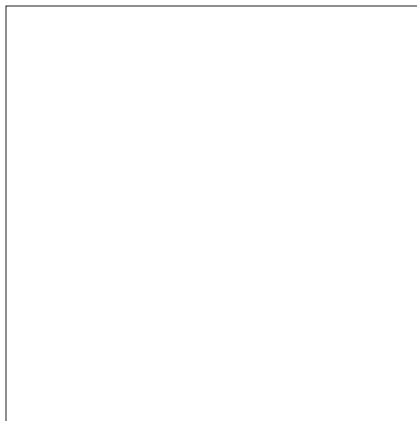
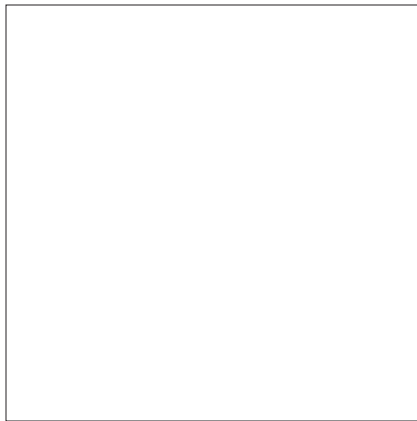
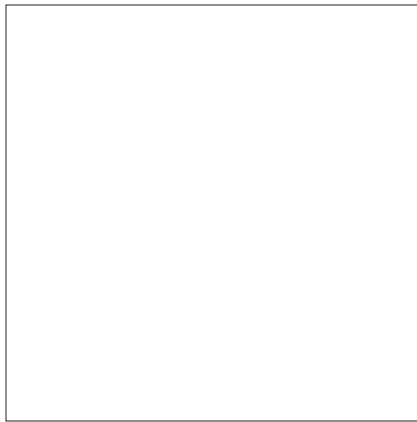
Epidendrum ciliare



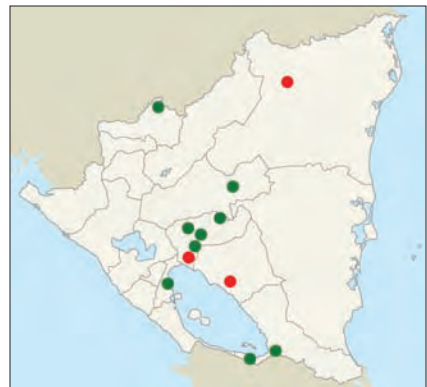
Epidendrum cnemidophorum



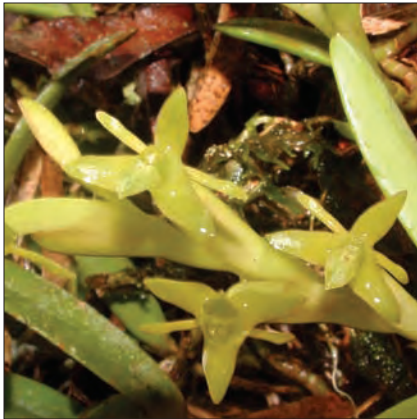
Epidendrum comayagüense



Epidendrum congestoides



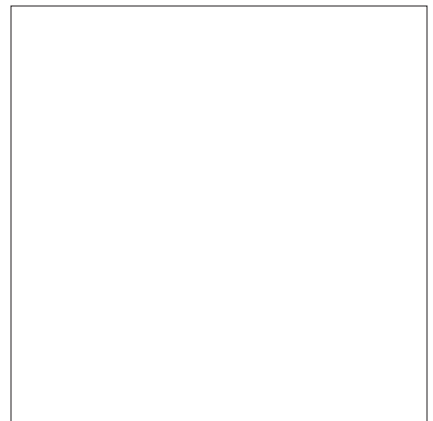
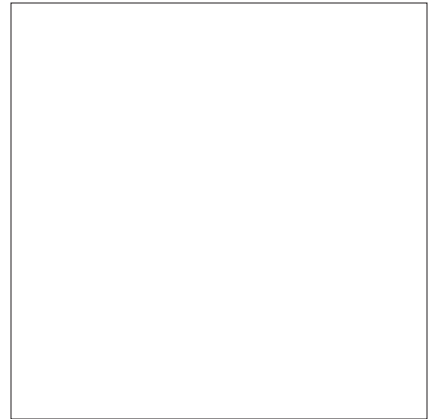
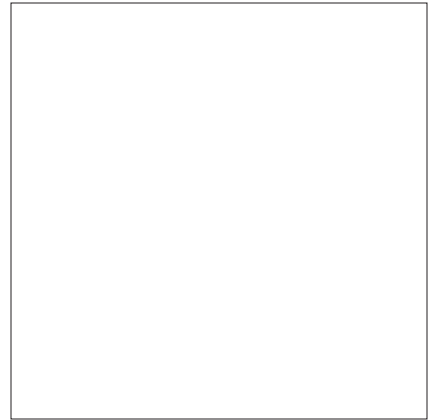
Epidendrum coriifolium



Epidendrum criniferum



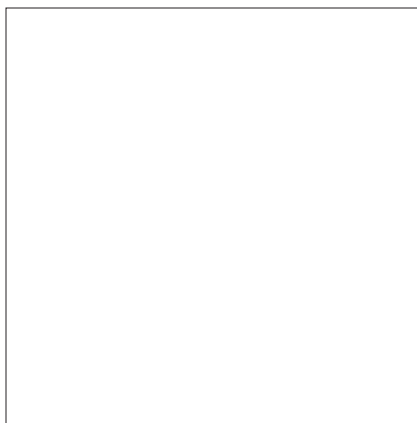
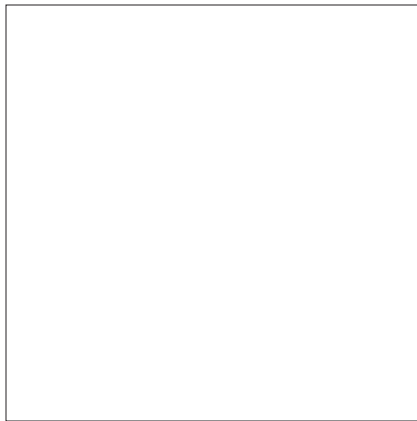
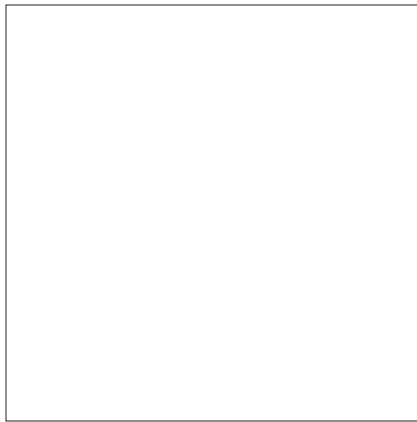
Epidendrum cystosum



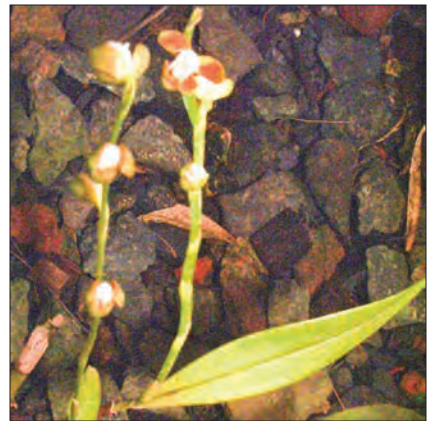
Epidendrum eburneum



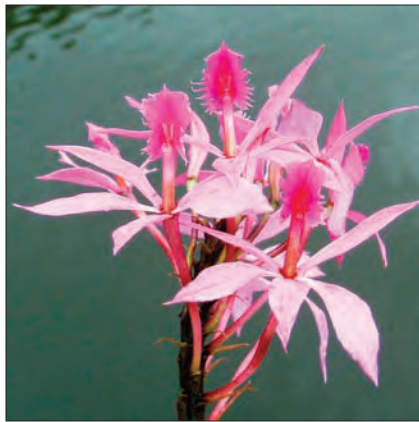
Epidendrum eustirum



Epidendrum firmum



Epidendrum flexuosum



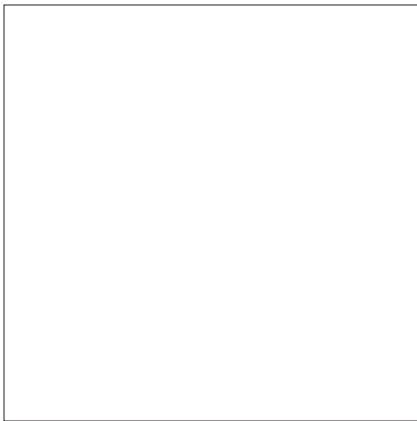
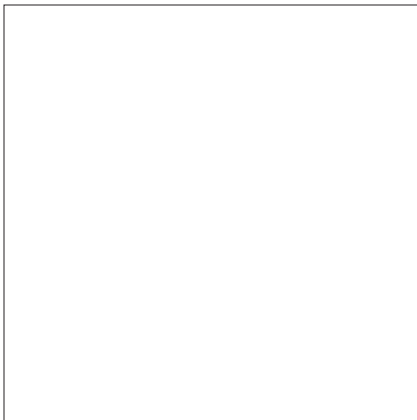
Epidendrum fruticosum



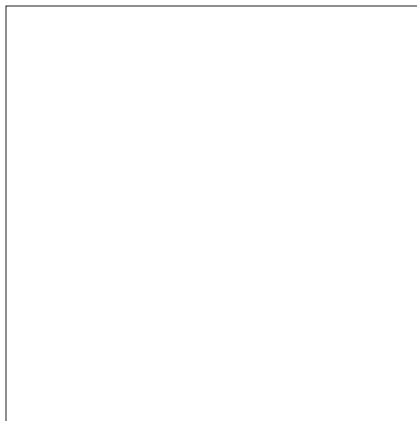
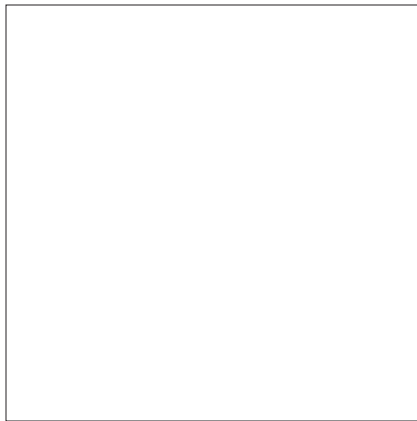
Epidendrum glumarum



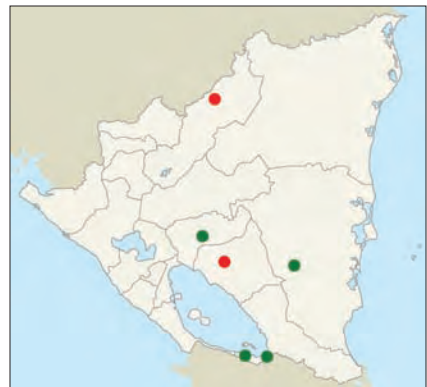
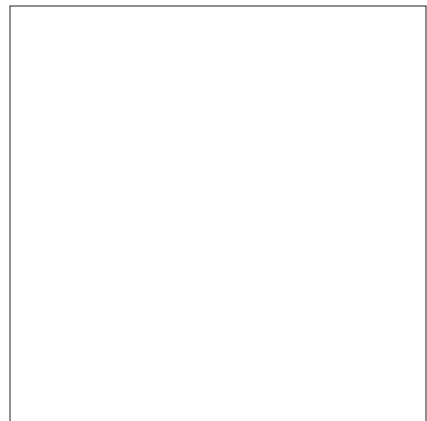
Epidendrum hellerianum



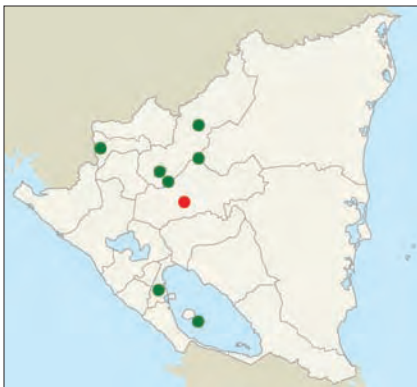
Epidendrum hunterianum



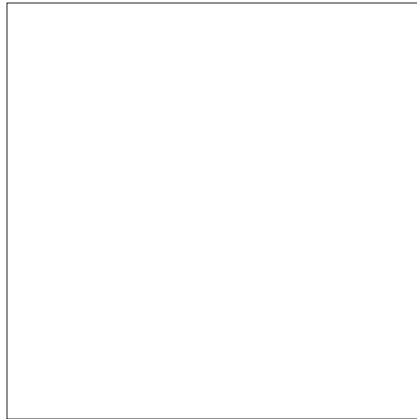
Epidendrum isomerum



Epidendrum lacustre



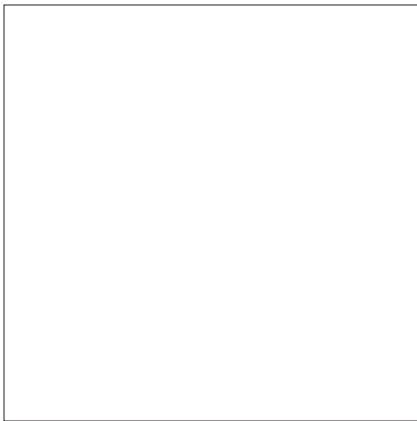
Epidendrum lagenocolumna



Epidendrum leucheanum



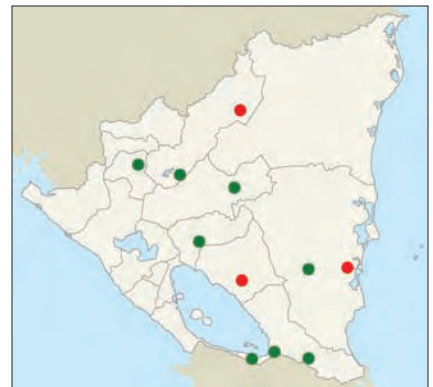
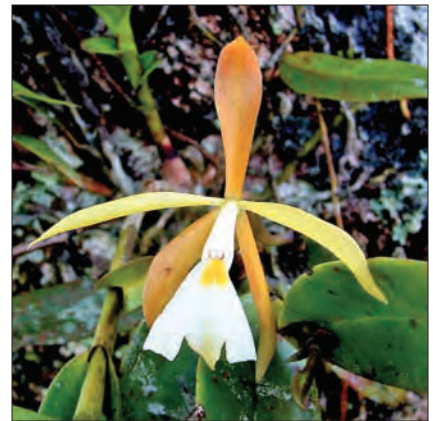
Epidendrum miserrimum



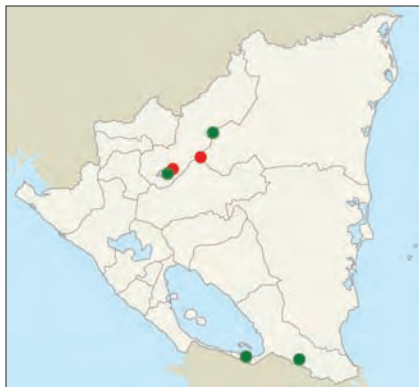
Epidendrum mixtum



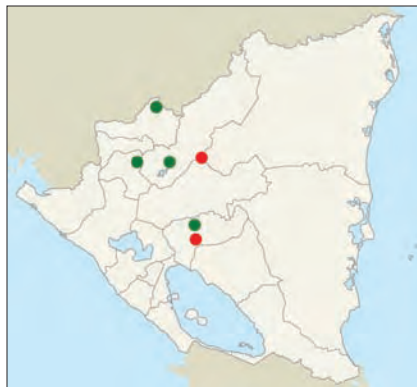
Epidendrum nocturnum



Epidendrum octomerioides



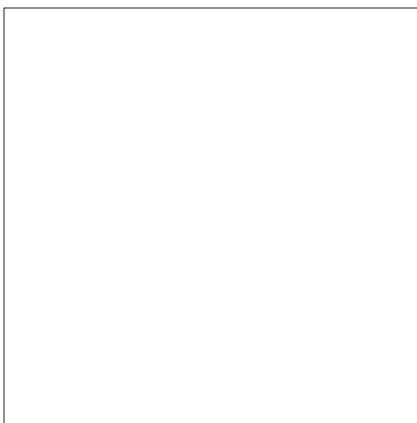
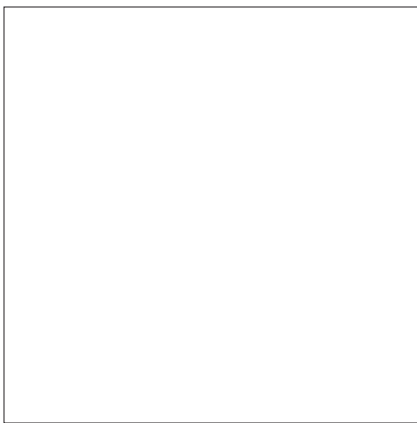
Epidendrum oerstedii



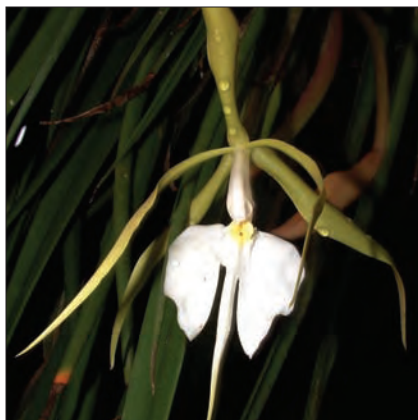
Epidendrum pansamalae



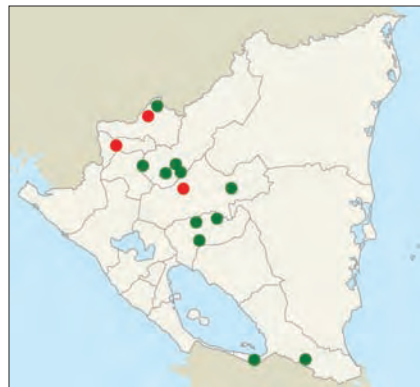
Epidendrum paranthicum



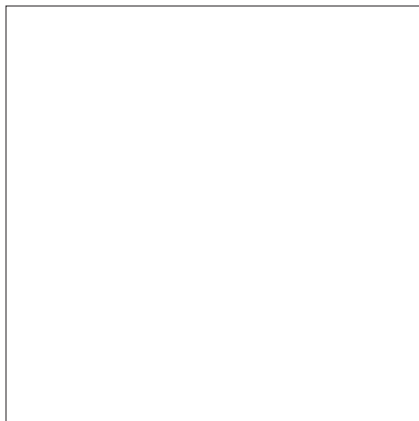
Epidendrum parkinsonianum



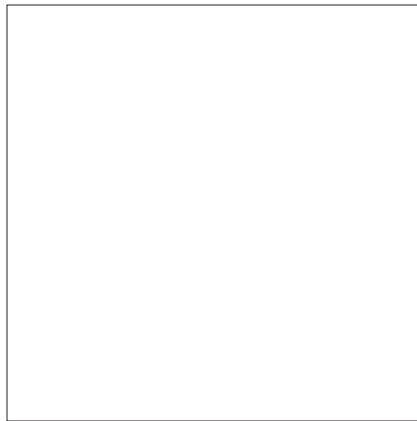
Epidendrum peperomia



Epidendrum phragmites



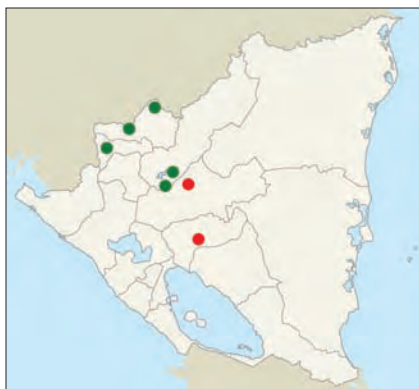
Epidendrum physodes



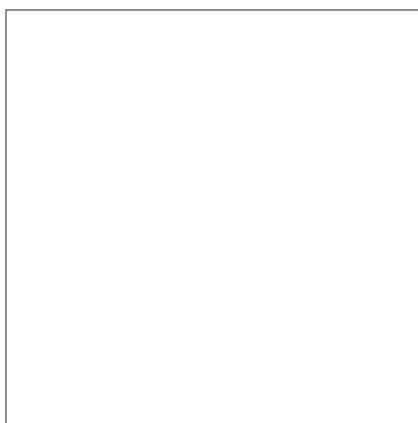
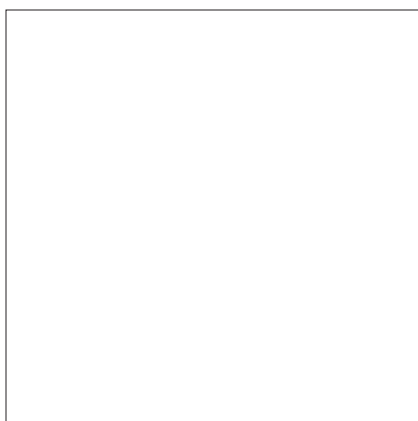
Epidendrum piliferum



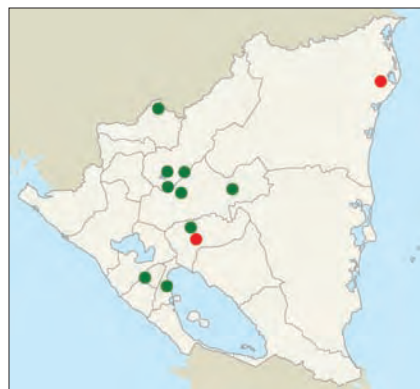
Epidendrum polyanthum



Epidendrum pseudoramosum



Epidendrum radicans



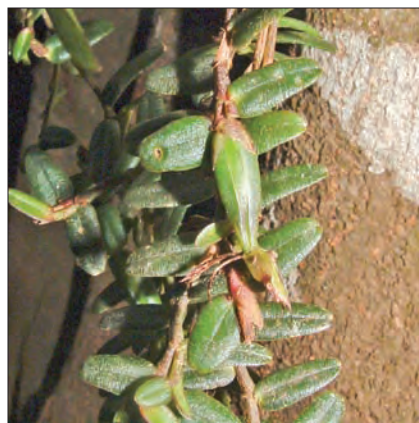
Epidendrum ramosum



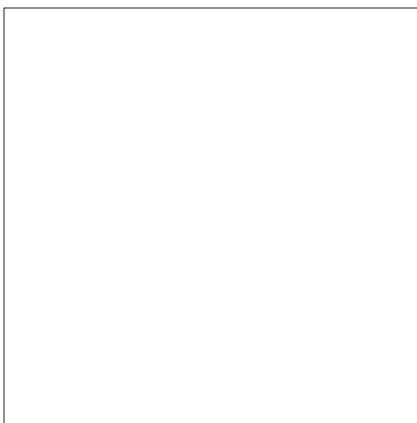
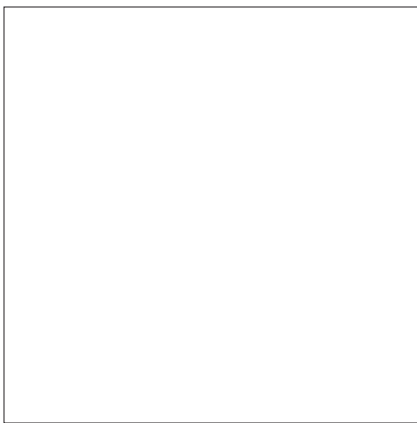
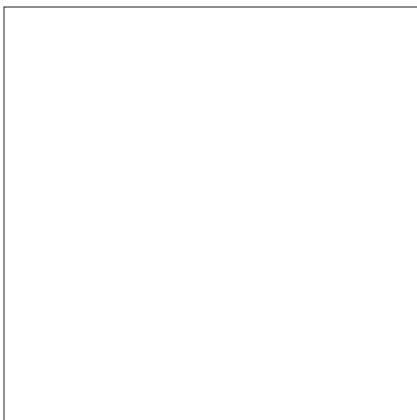
Epidendrum raniferum



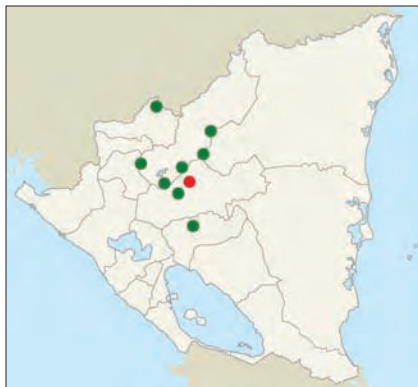
Epidendrum repens



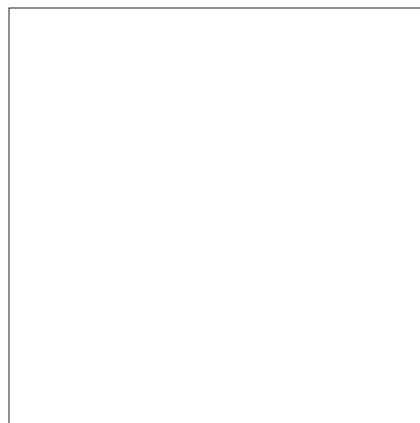
Epidendrum santaclareense



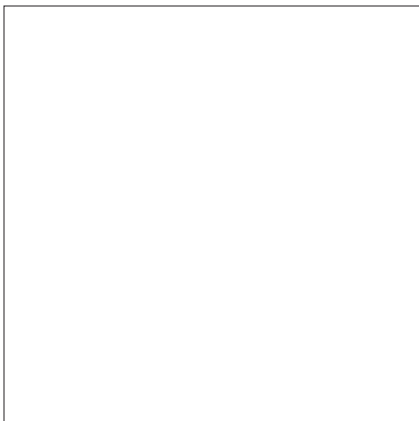
Epidendrum scriptum



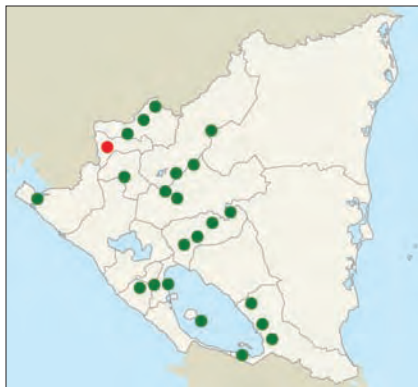
Epidendrum sp.



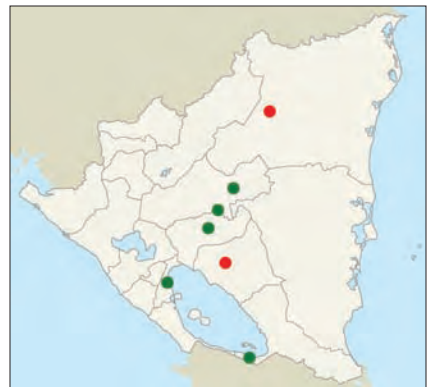
Epidendrum selaginella



Epidendrum stamfordianum



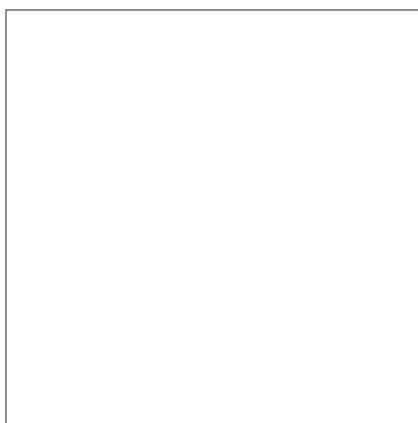
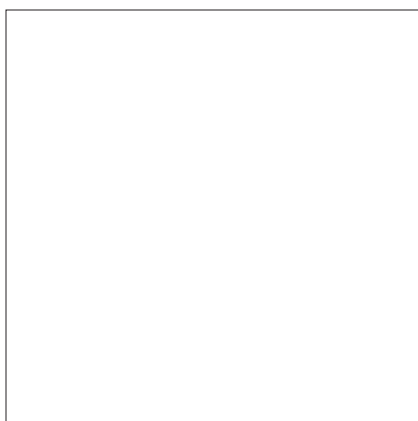
Epidendrum stangeanum



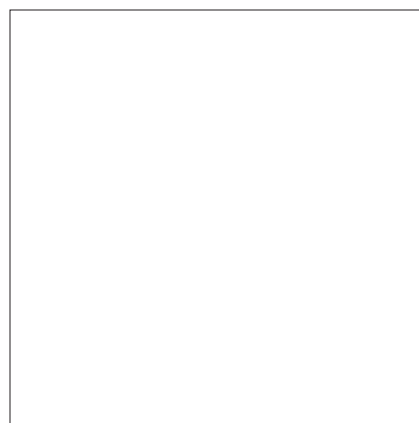
Epidendrum strobiliferum



Epidendrum trachythece



Epidendrum tridens



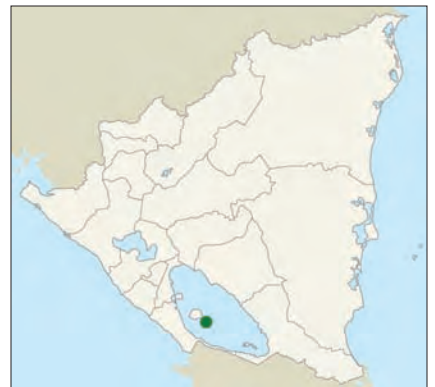
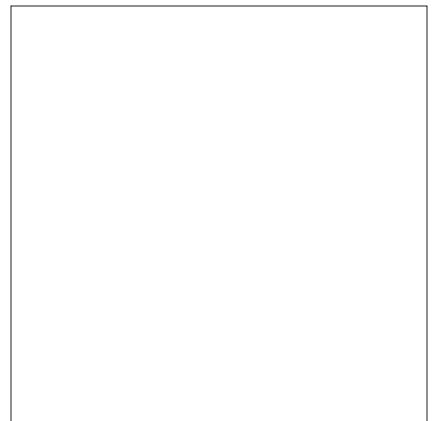
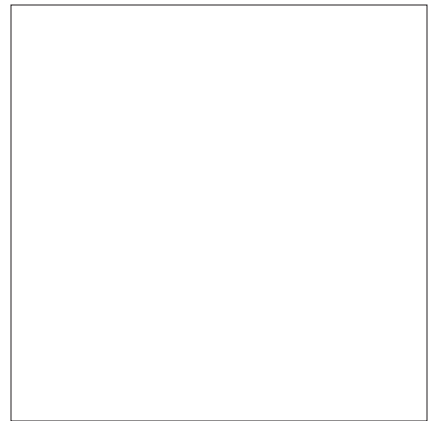
Epidendrum turialvae



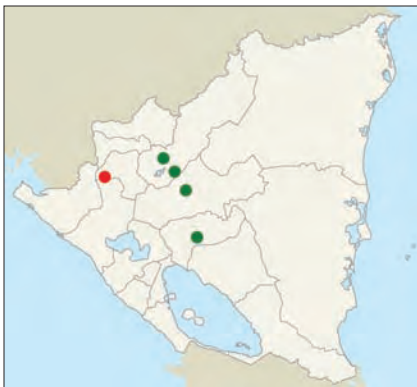
Epidendrum verrucosum



Epidendrum vulcanicola



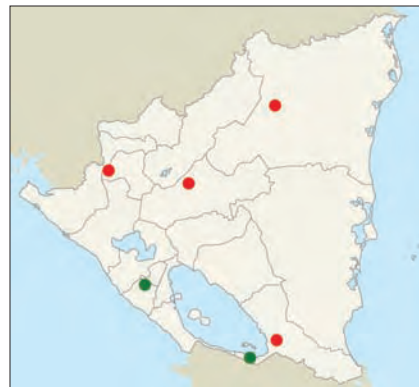
Erycina crista-galli



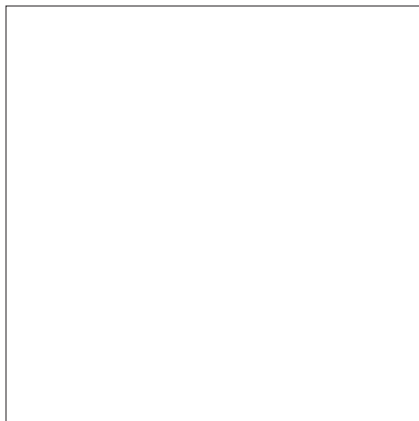
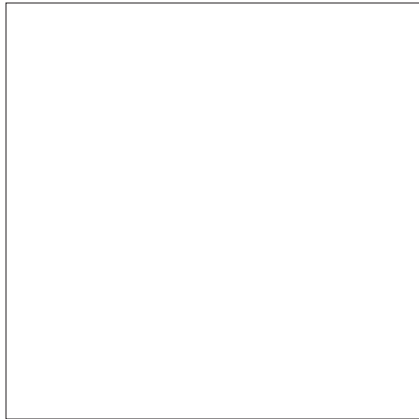
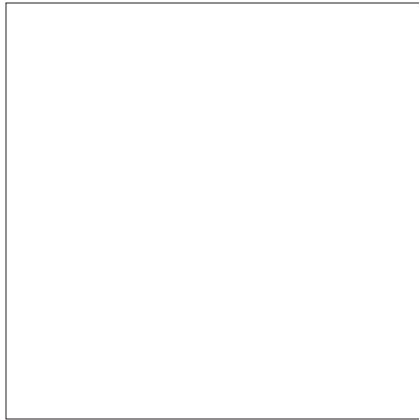
Erycina gnoma



Erycina pusilla



Erythrodes vesicifera



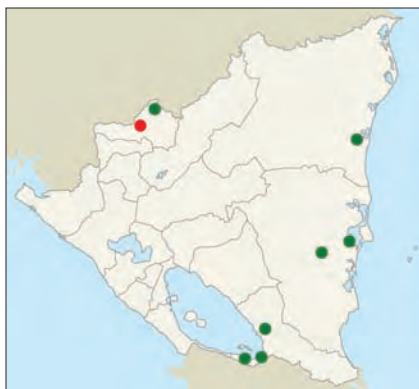
Eulophia alta



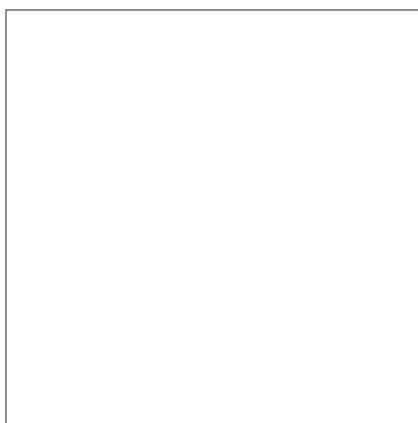
Eurystyles ananassocomus



Galeandra dives



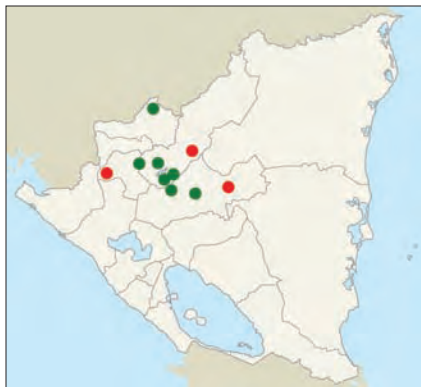
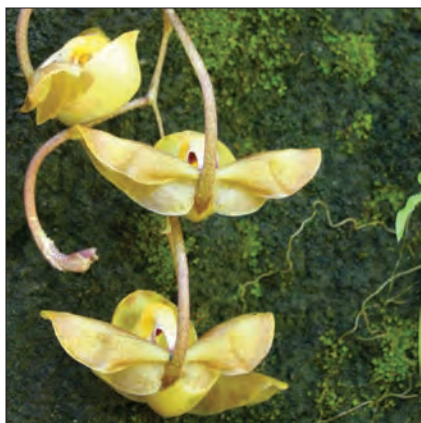
Galeottia grandiflora



Gongora armeniaca



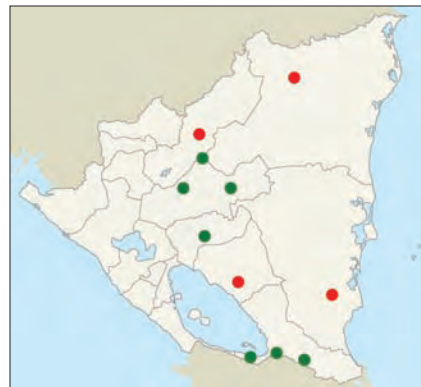
Gongora cassidea



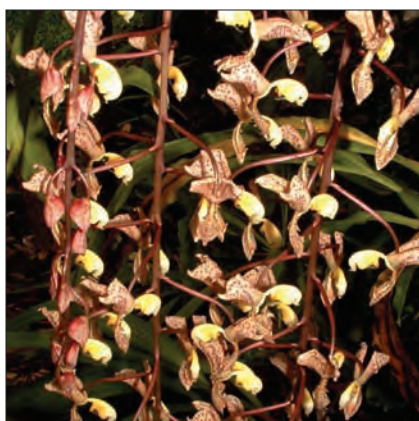
Gongora claviodora



Gongora leucohila



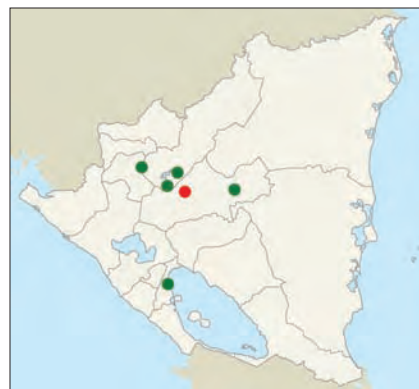
Gongora truncata



Gongora unicolor



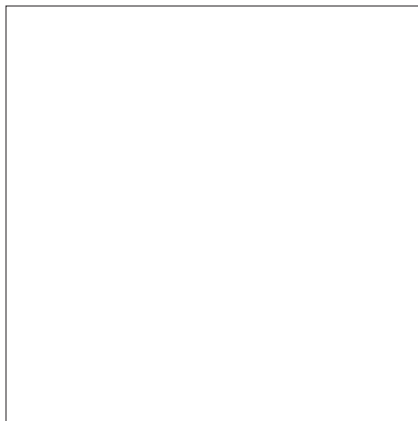
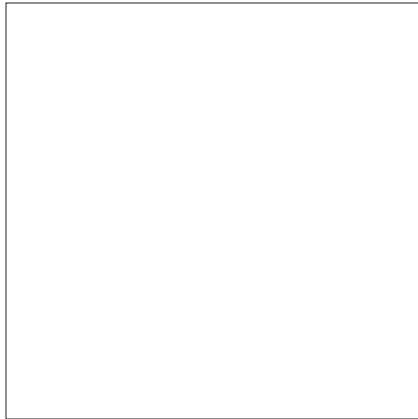
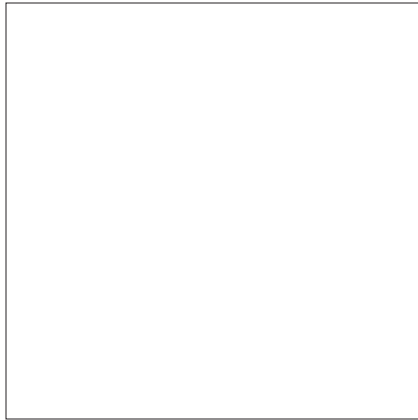
Goniochilus leochilinus



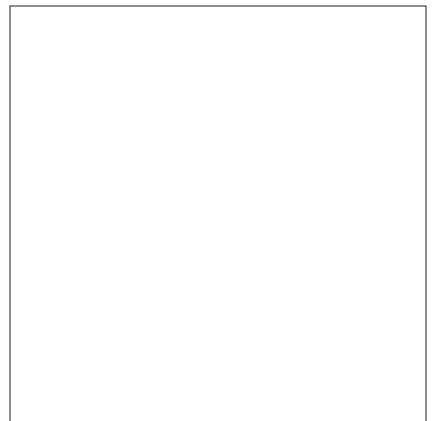
Goodyera bradeorum



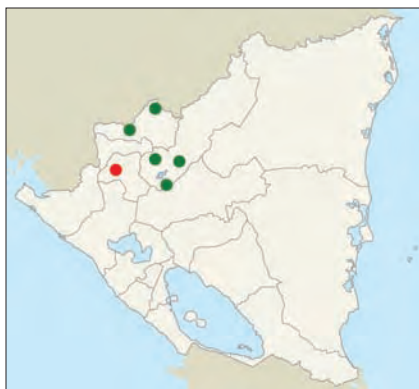
Goodyera erosa



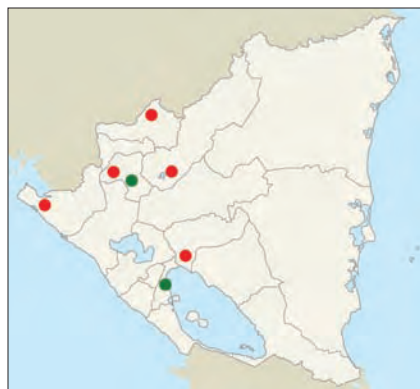
Goodyera major



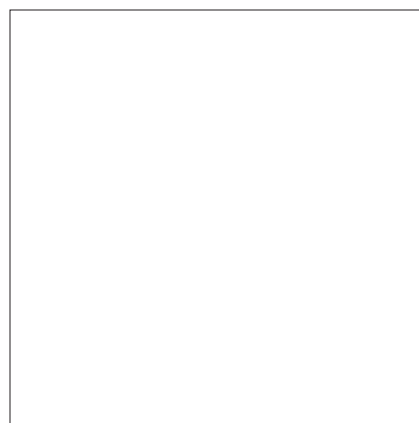
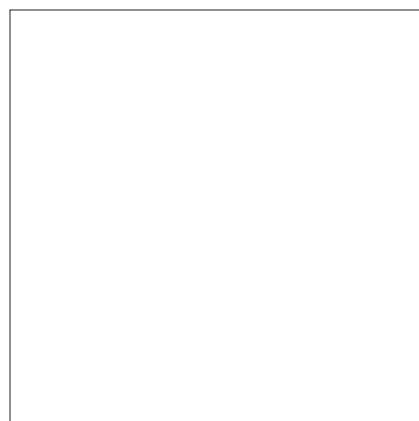
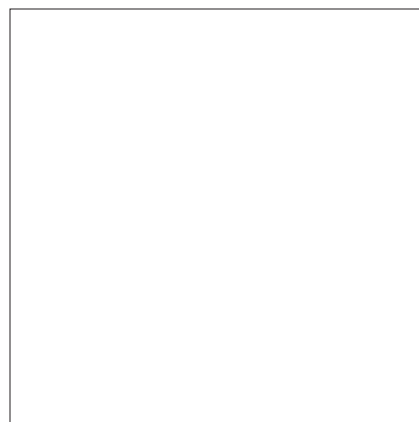
Govenia liliacea



Govenia mutica



Govenia pupusii



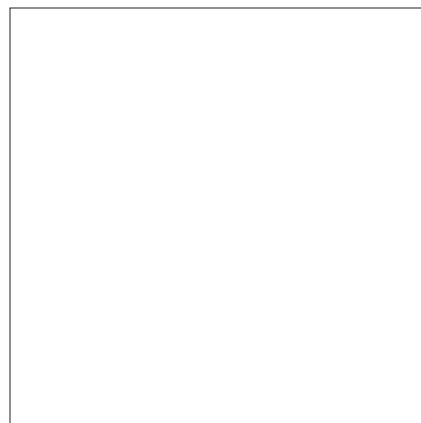
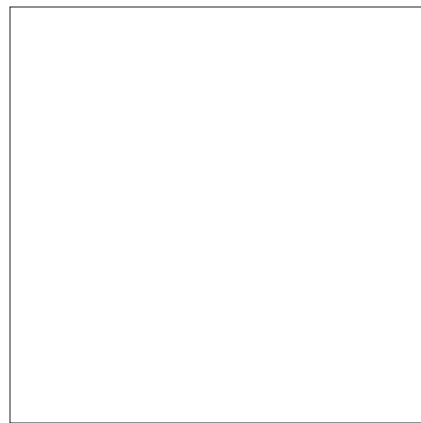
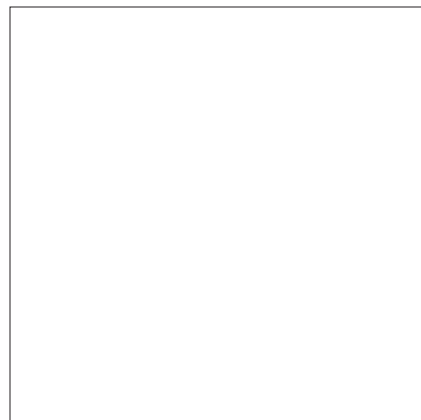
Govenia utriculata



Guarianthe aurantiaca



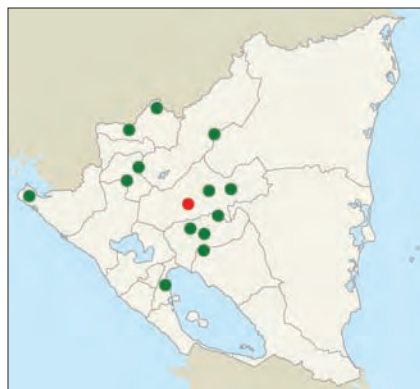
Guarianthe pachecoi



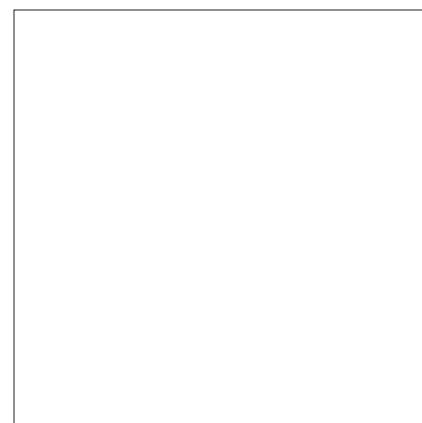
Guarianthe patinii



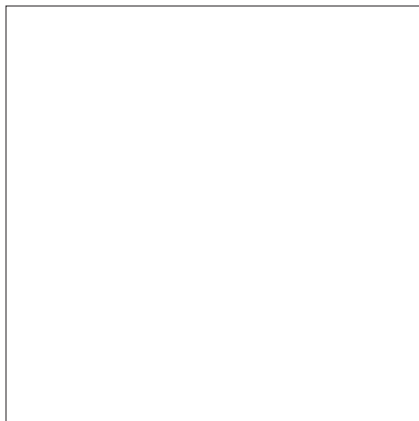
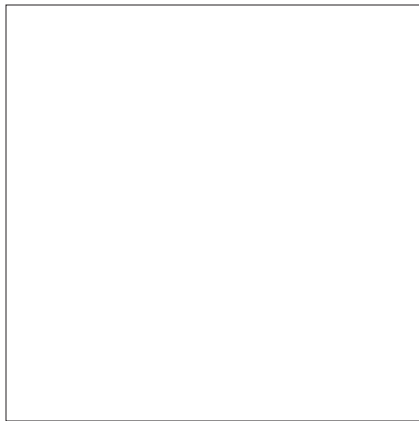
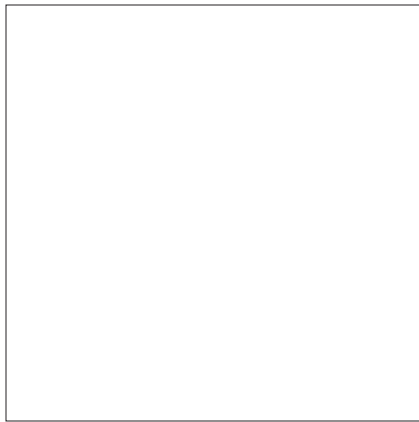
Guarianthe skinneri



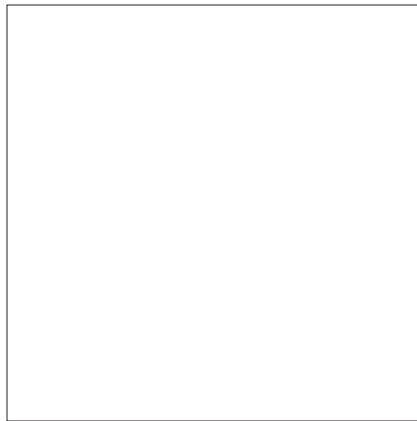
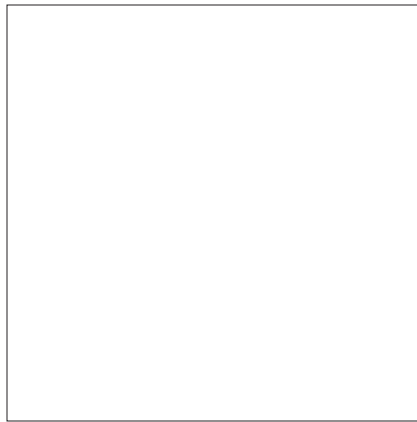
Guarianthe skinneri
guatemalensis



Habenaria alata



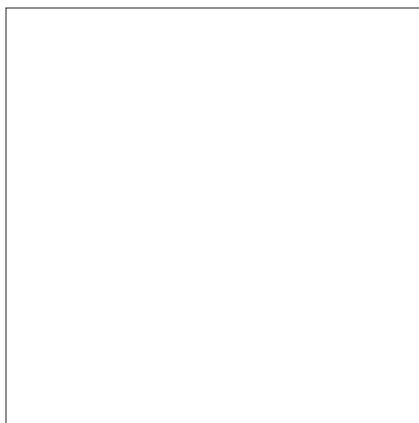
Habenaria clypeata



Habenaria distans



Habenaria entomantha



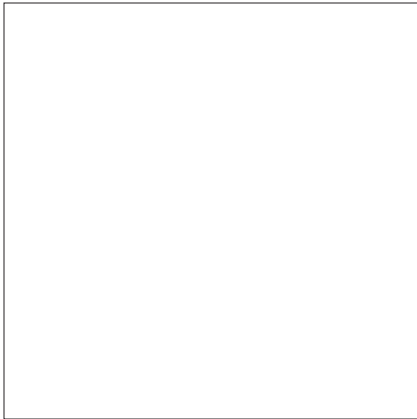
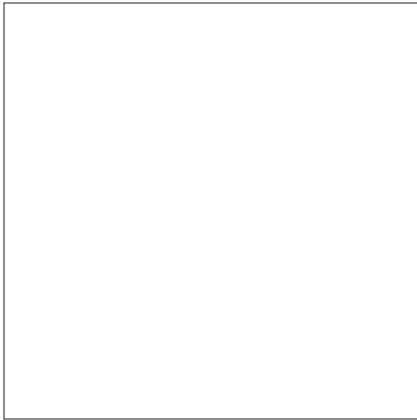
Habenaria eustachya



Habenaria floribunda



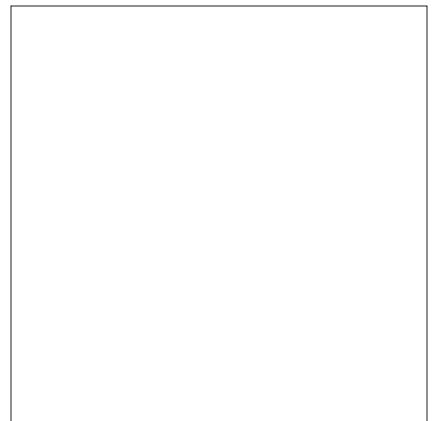
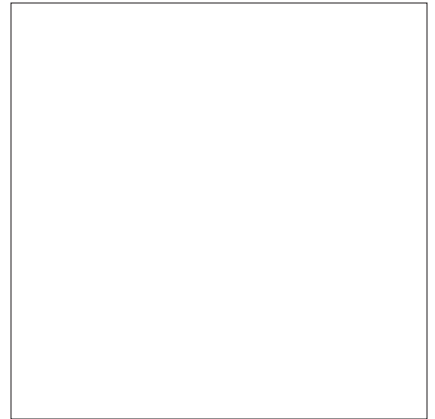
Habenaria mesodactyla



Habenaria monorrhiza



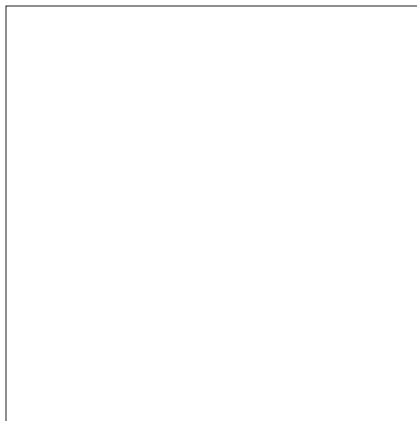
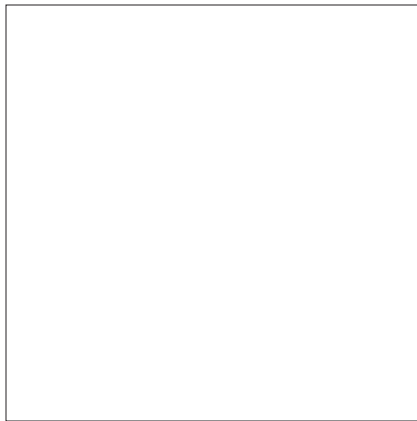
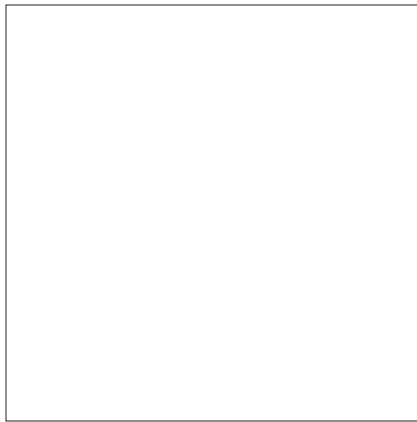
Habenaria novemfida



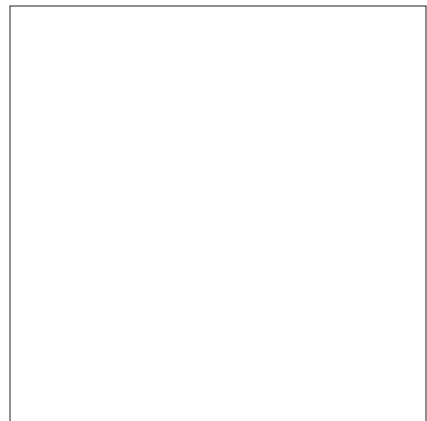
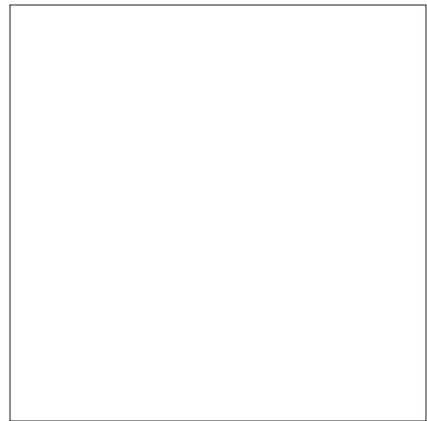
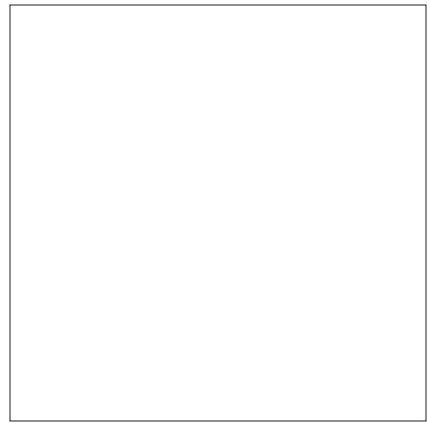
Habenaria odontopetala



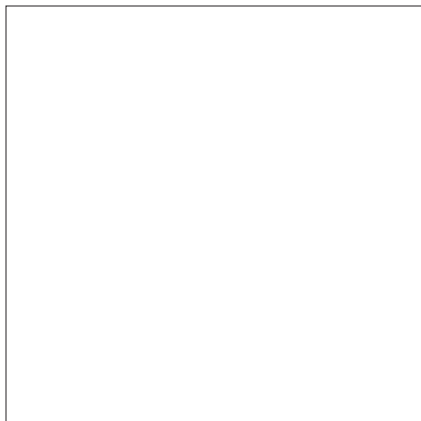
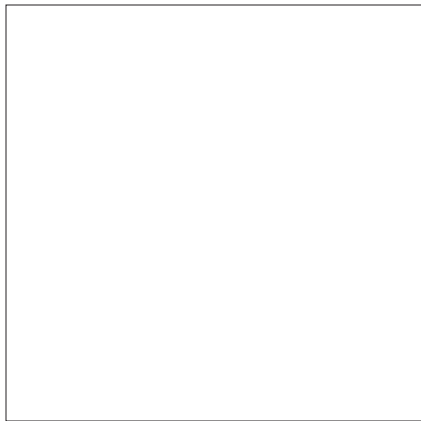
Habenaria oerstedii



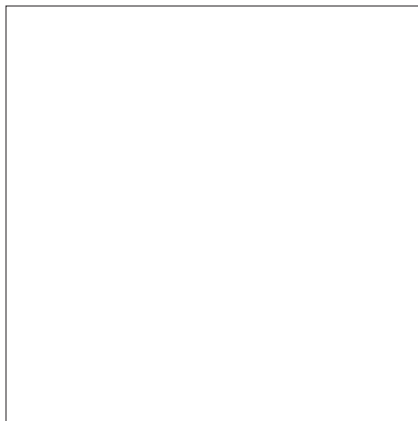
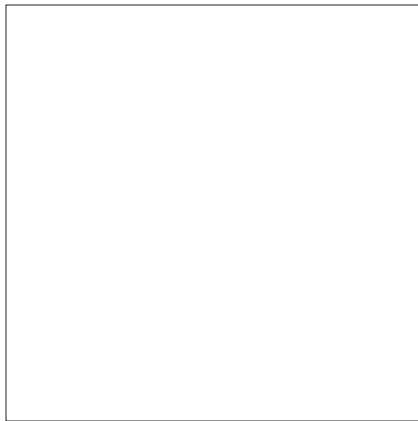
Habenaria pringlei



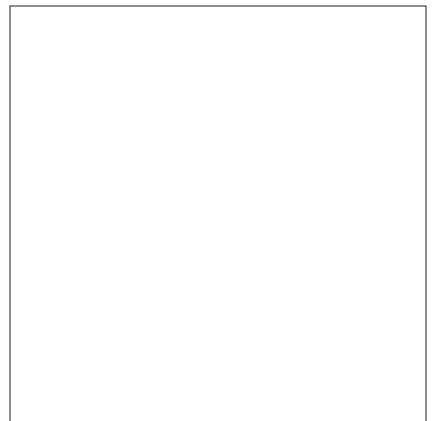
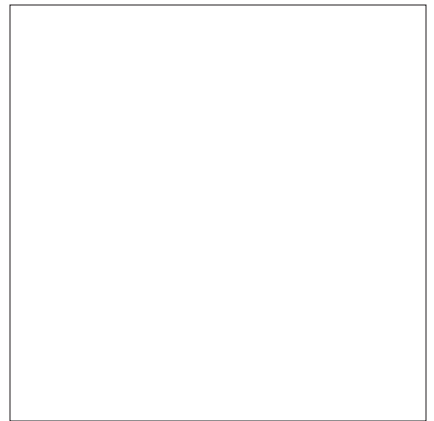
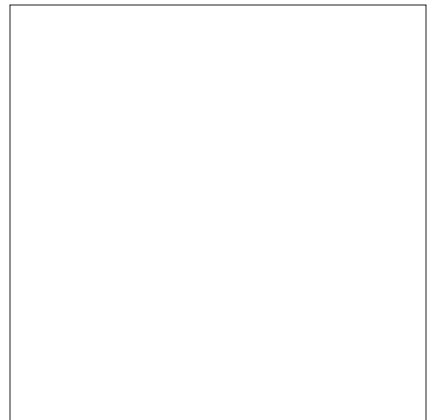
Habenaria quinqueseta



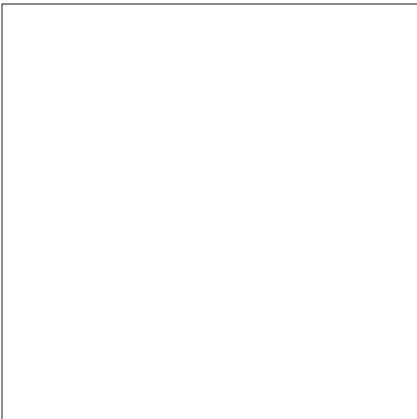
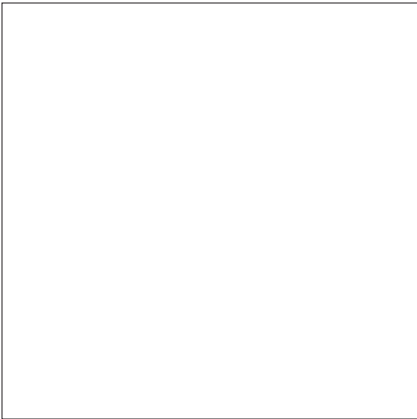
Habenaria repens



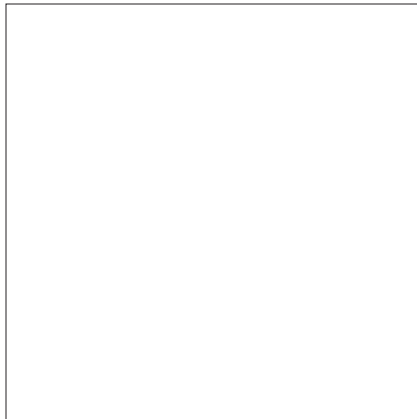
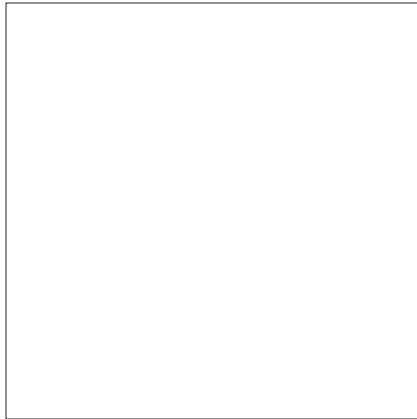
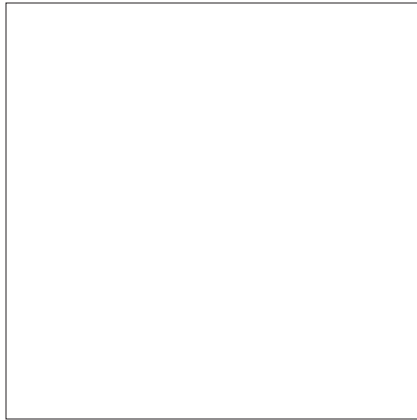
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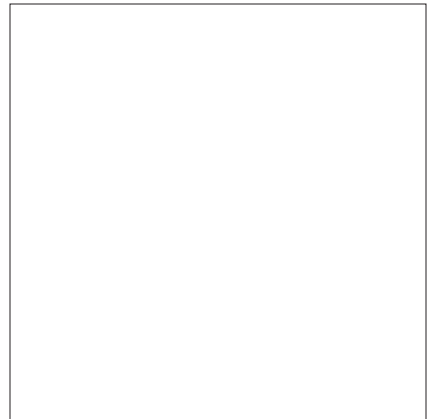
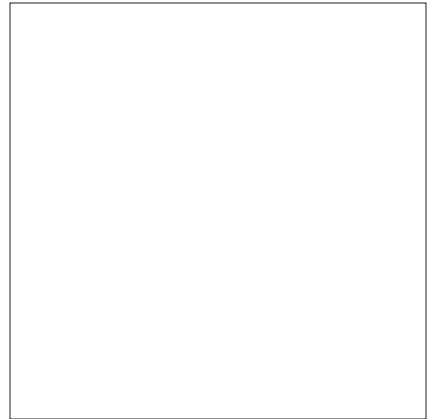
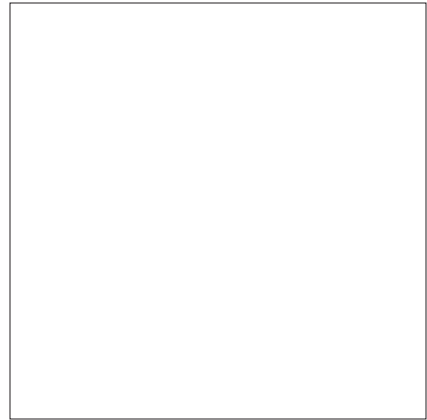
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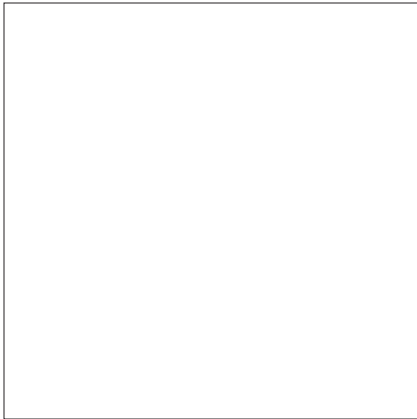
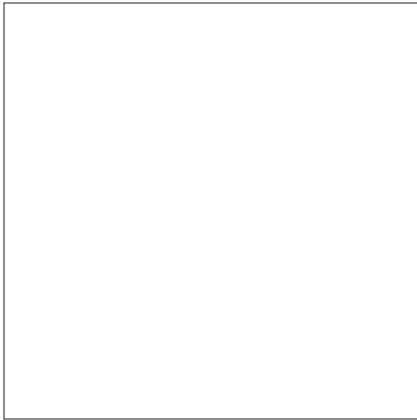
Habenaria umbratilis



Habenaria wercklei



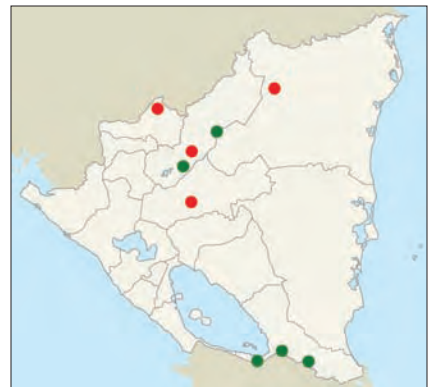
Hapalorchis lineatus



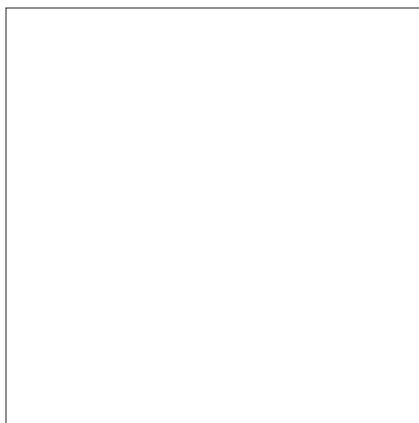
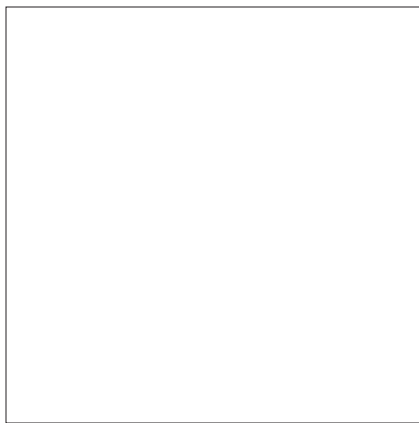
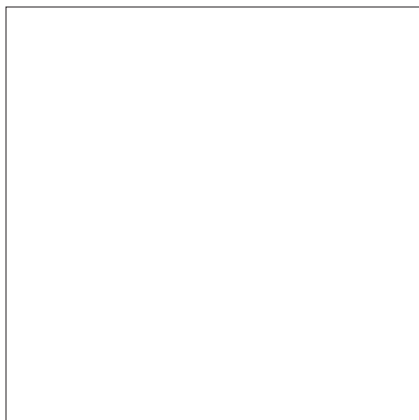
Helleriella nicaraguensis



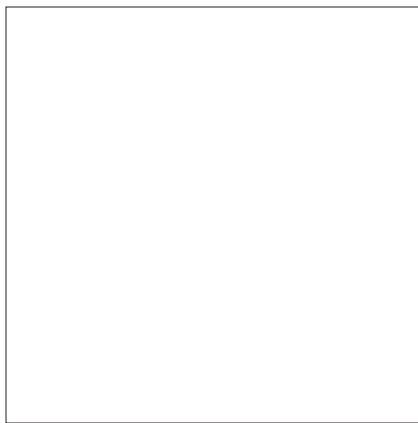
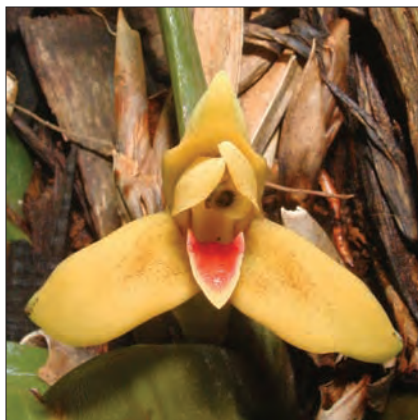
Heterotaxis crassifolia



Heterotaxis discolor



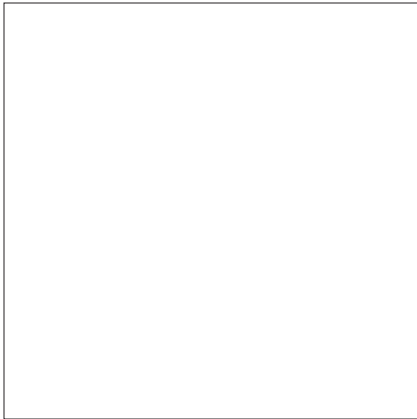
Heterotaxis maleolens



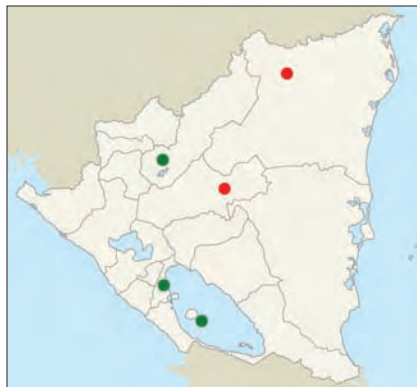
Heterotaxis valenzuelana



Homalopetalum pumilio



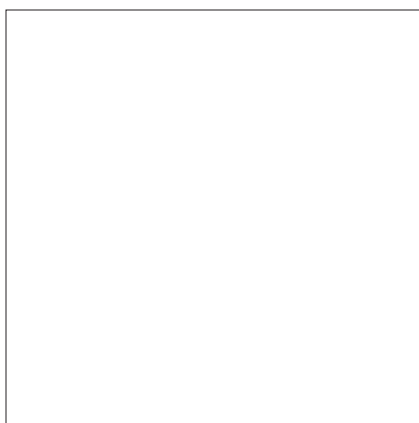
Houlettia tigrina



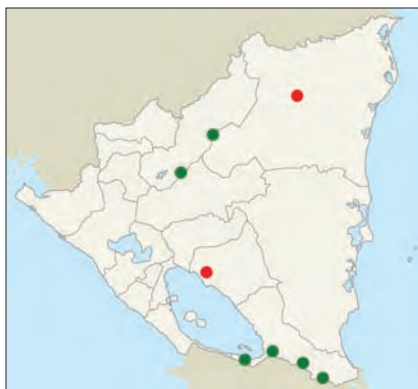
Huntleya burtii



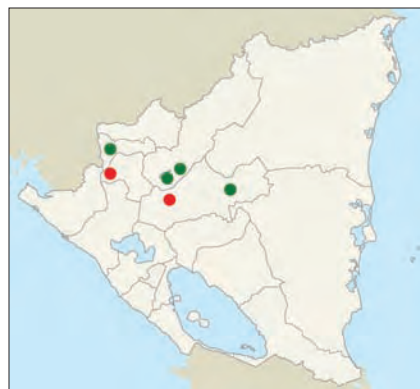
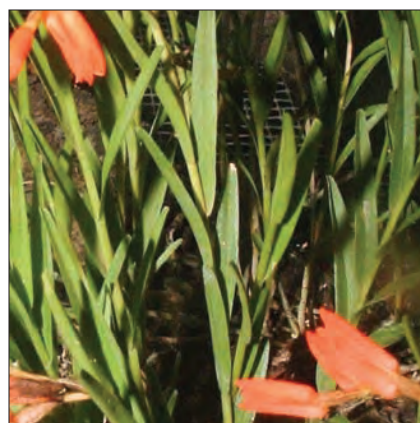
Ionopsis satyroides



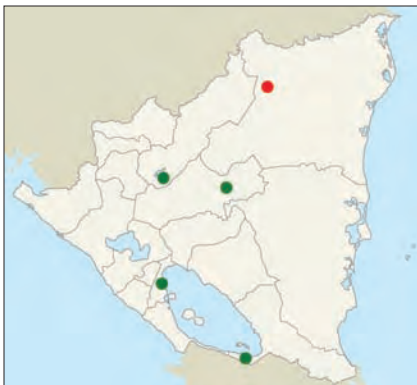
Ionopsis utricularoides



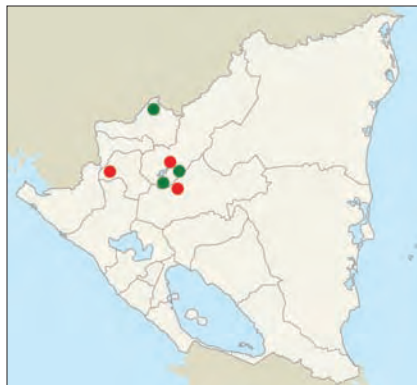
Isochilus aurantiacus



Isochilus carnosiflorus



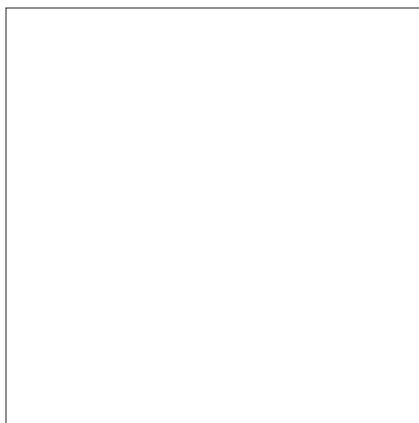
Isochilus chiriquensis



Isochilus latibracteatus



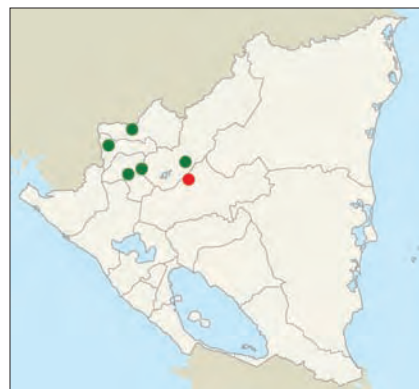
Isochilus linearis



Isochilus major



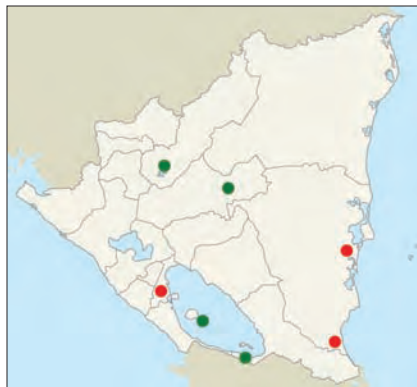
Jacquiniella cobanensis



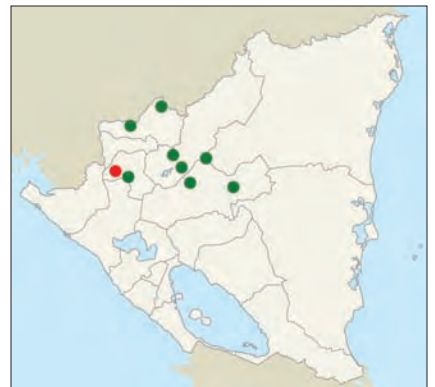
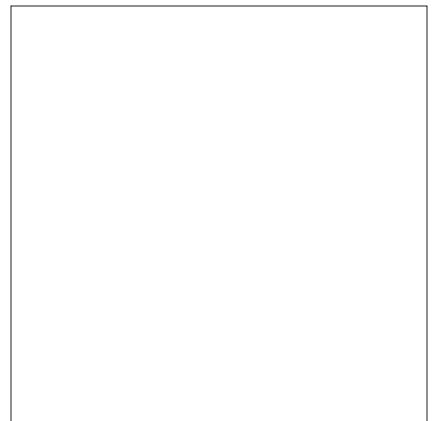
Jacquiniella equitantifolia



Jacquiniella globulosa



Jacquiniella teretefolia



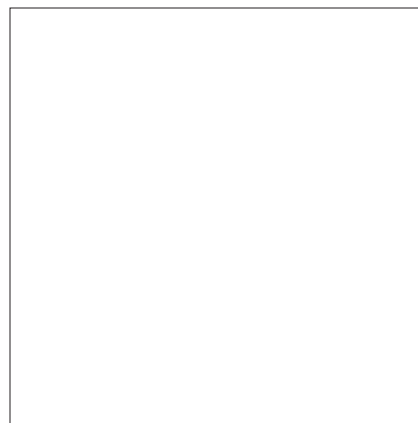
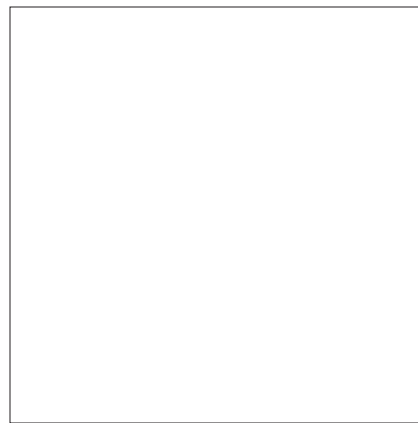
Kefersteinia costarricensis



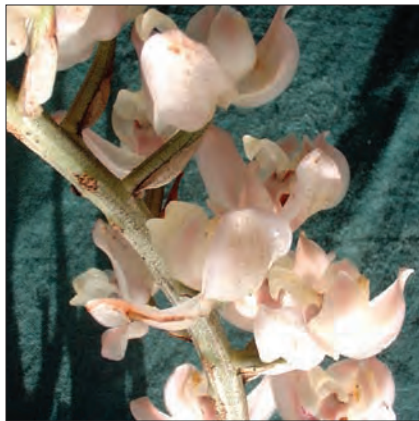
Kegeliella atropilosa



Kionophyton pyramidalis



Lacaena bicolor



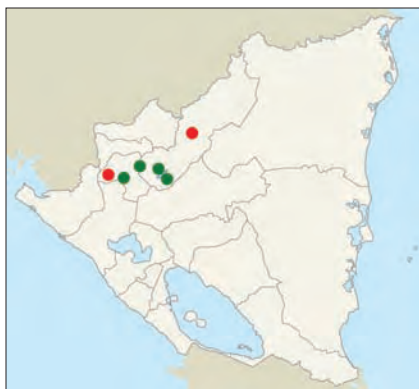
Lacaena spectabilis



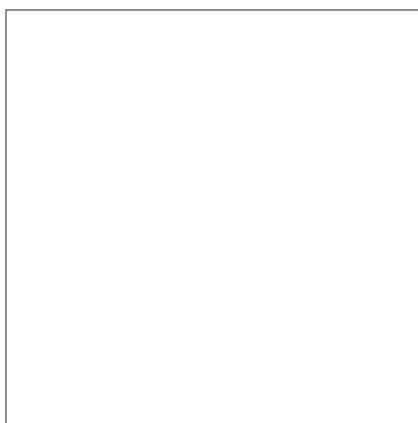
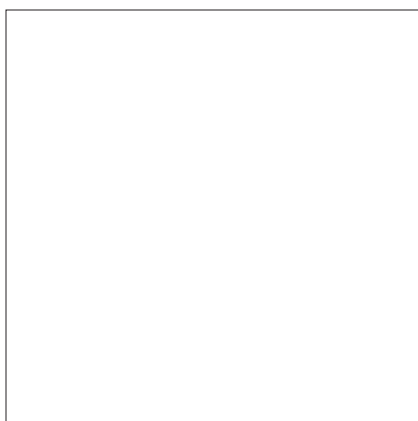
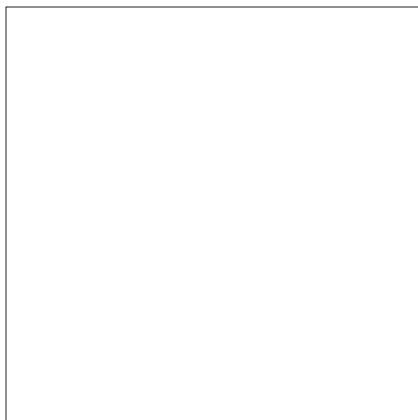
Laelia rubescens



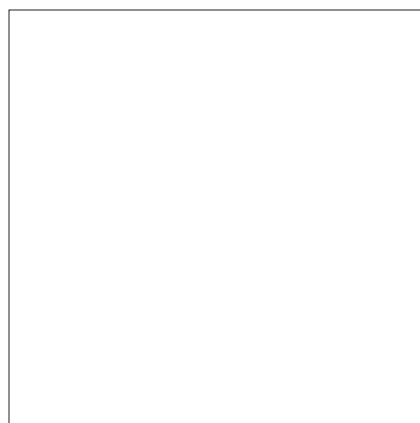
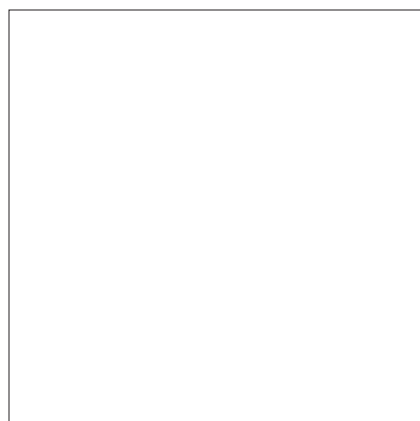
Laelia superbiens



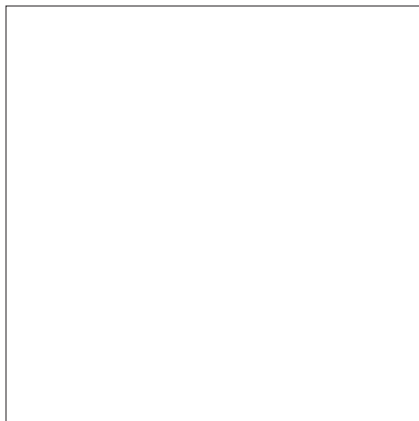
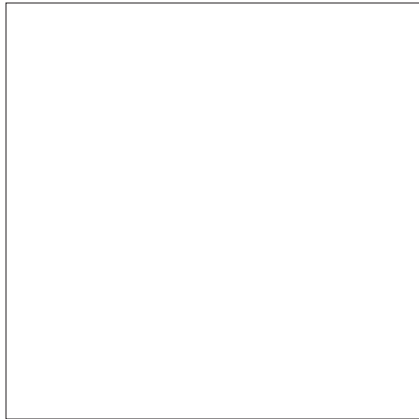
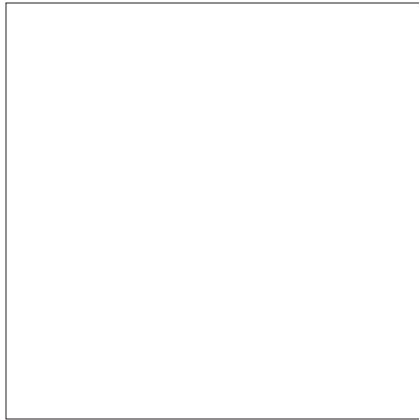
Lemboglossum cordatum



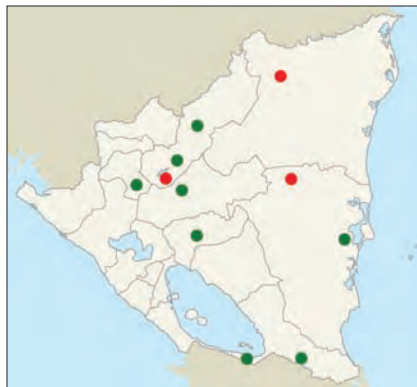
Lemboglossum rossii



Leochilus johnstonii



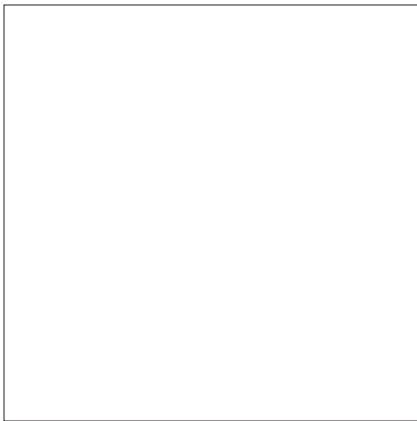
Leochilus labiatus



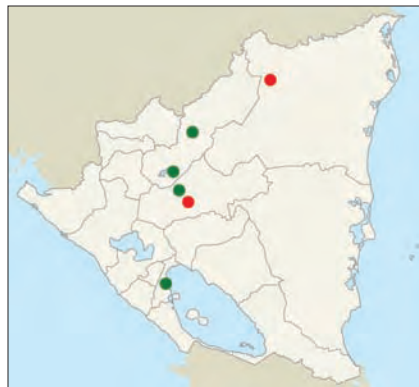
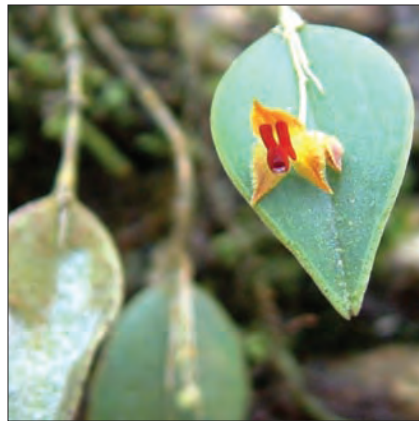
Leochilus scriptus



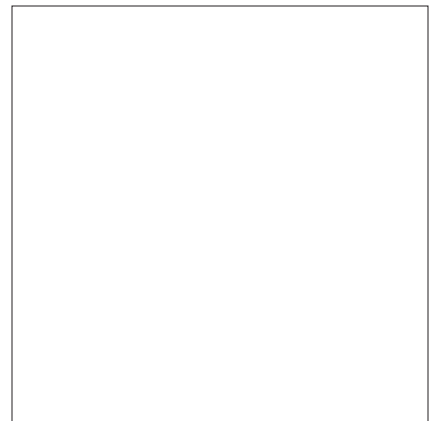
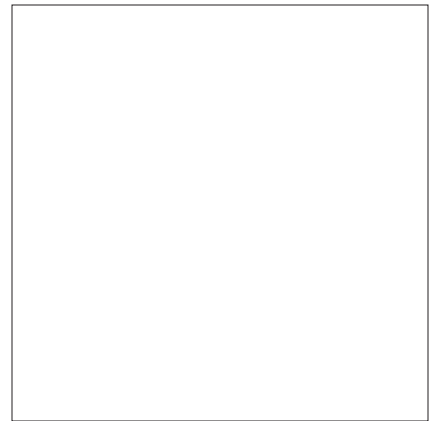
Lepanthes acuminata



Lepanthes blepharistes



Lepanthes costaricensis



Lepanthes disticha



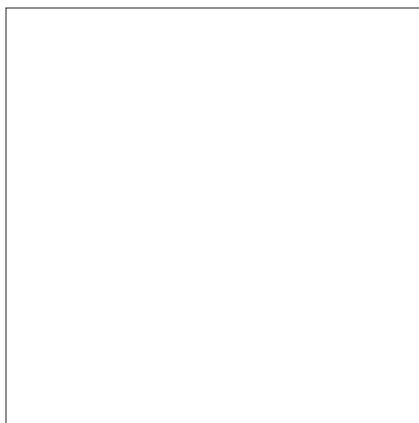
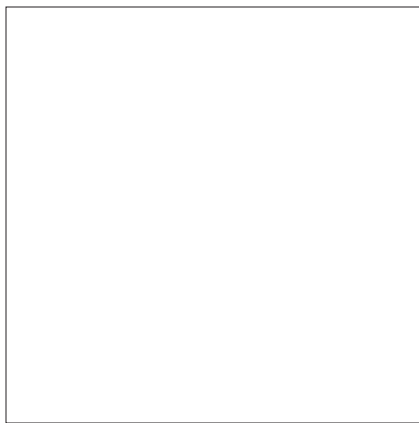
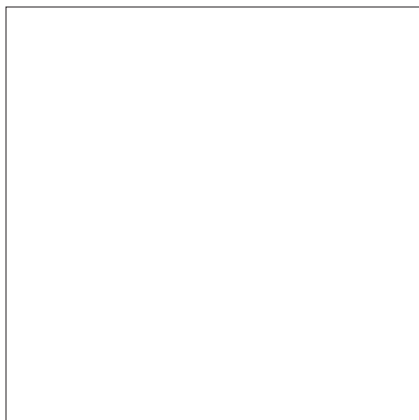
Lepanthes edwardsii



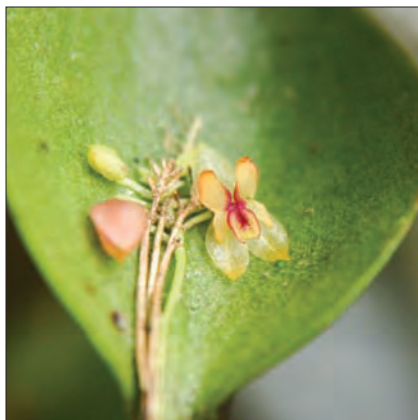
Lepanthes eximia



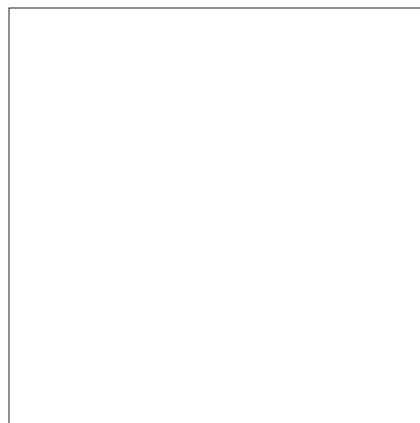
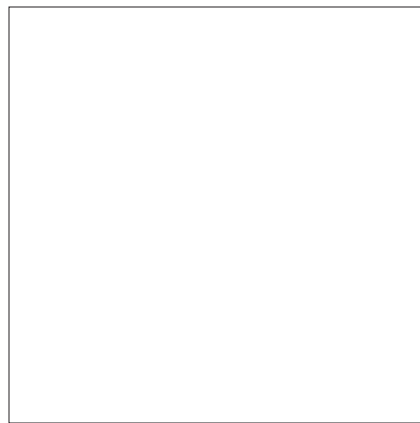
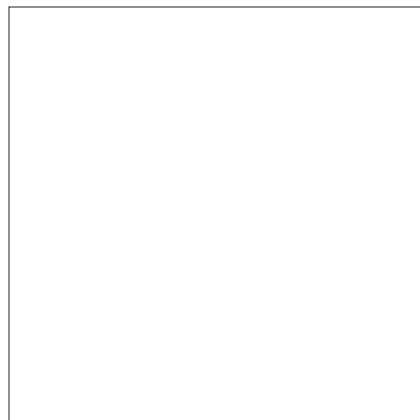
Lepanthes guanacastensis



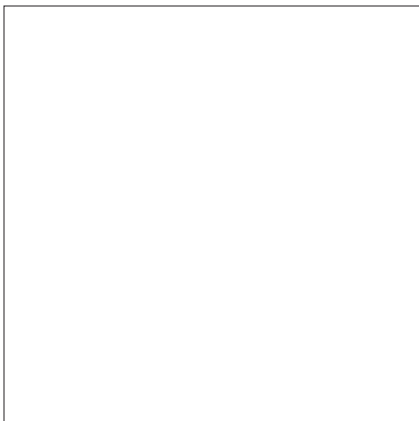
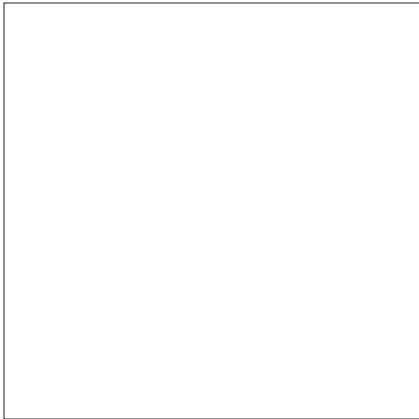
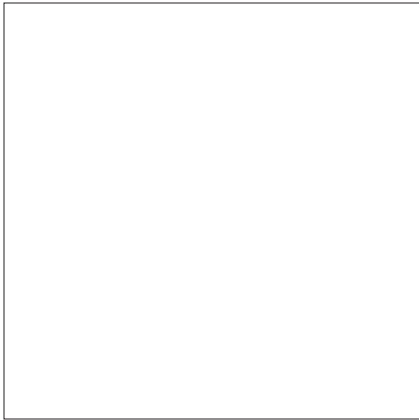
Lepanthes helleri



Lepanthes johnsonii



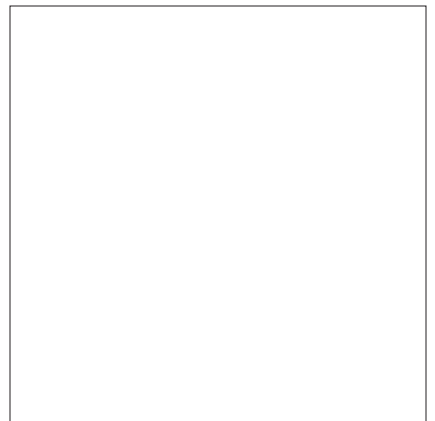
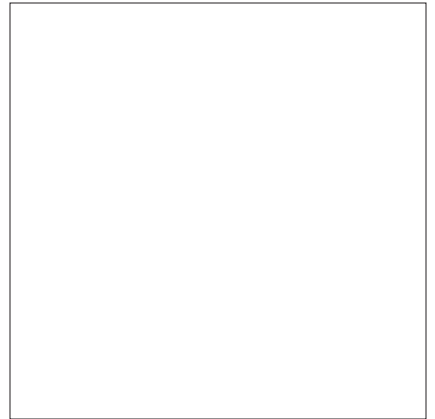
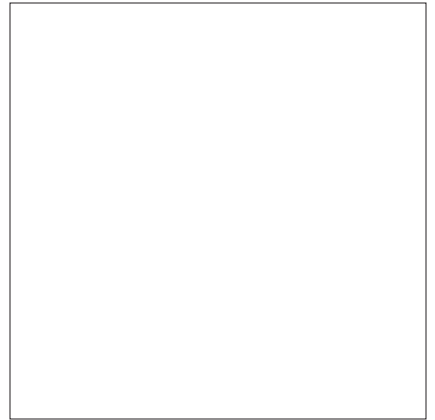
Lepanthes oreocharis



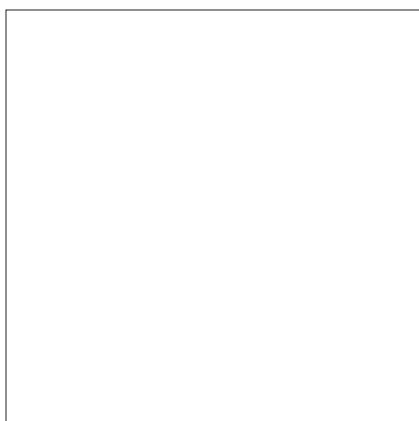
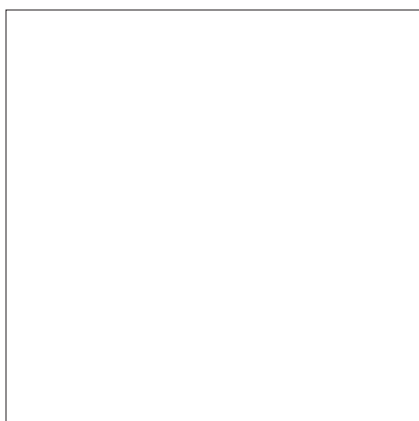
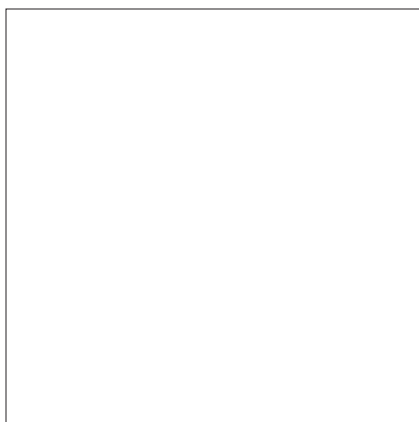
Lepanthes sp



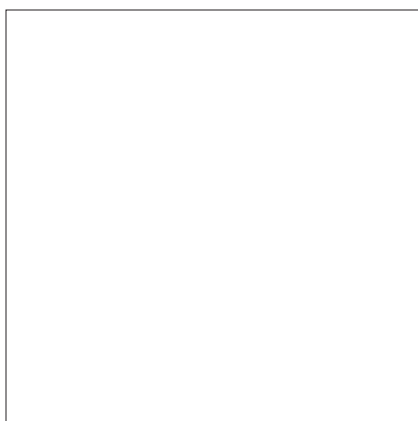
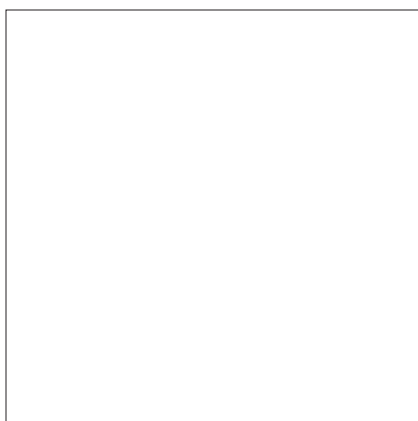
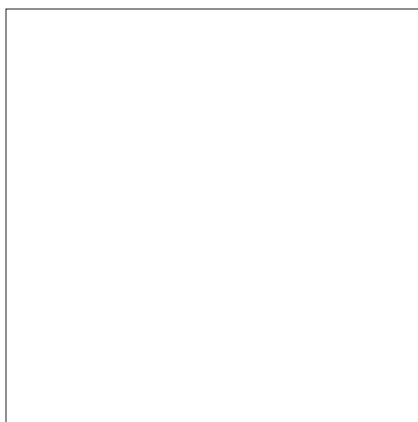
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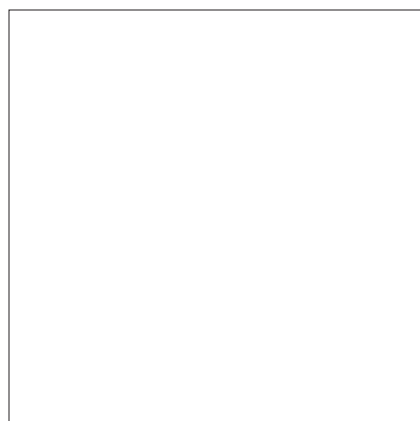
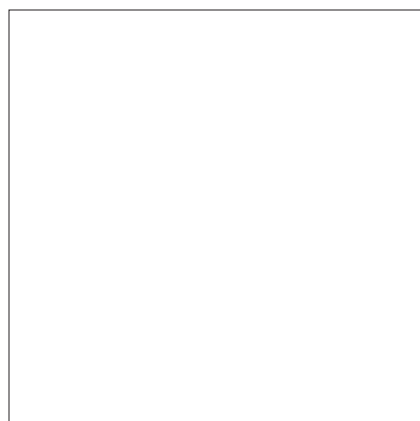
Lepanthopsis floripecten



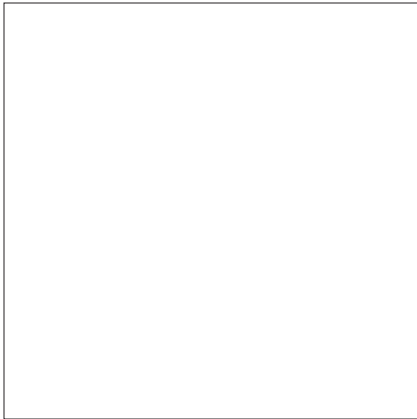
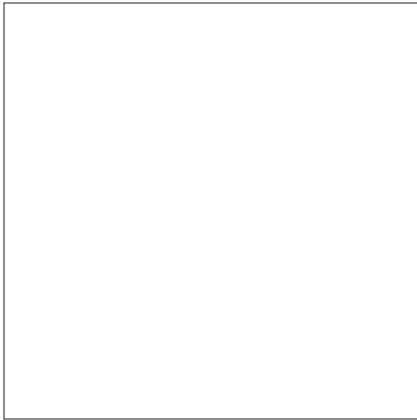
Leucohyle subulata



Liparis arnoglossophylla



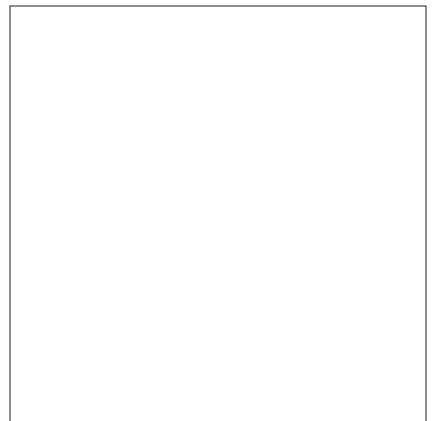
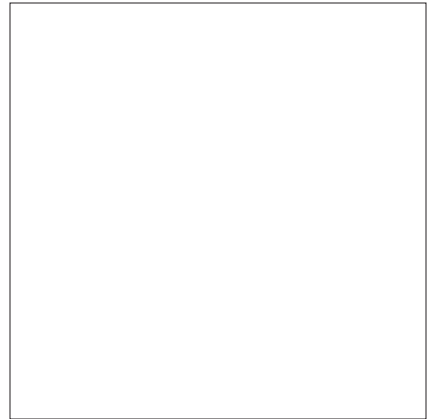
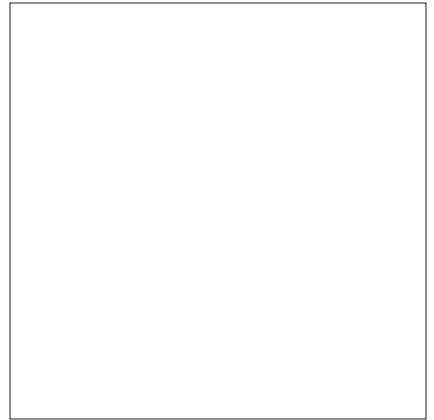
Liparis cordiformis



Liparis nervosa



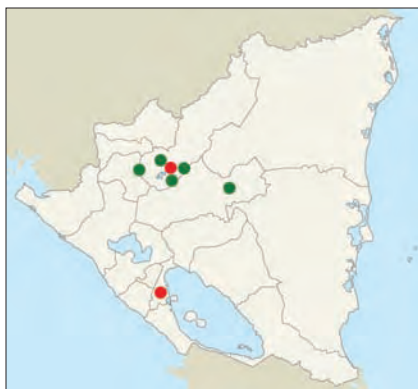
Liparis vexillifera



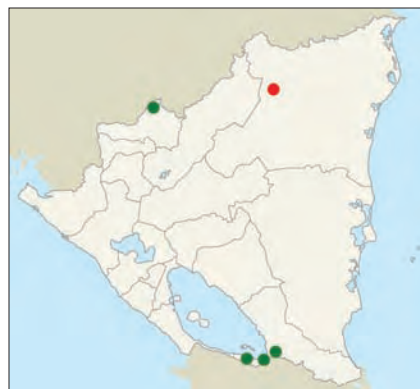
Lockhartia amoena



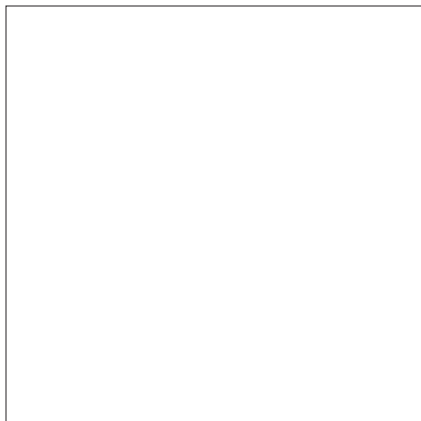
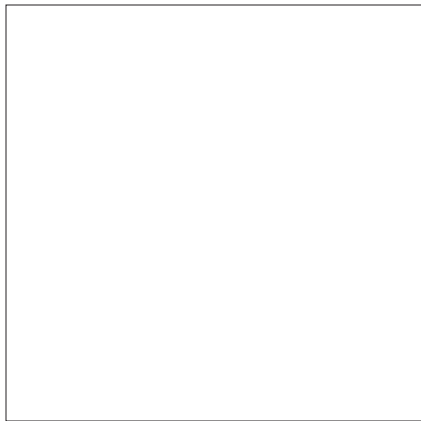
Lockhartia hercodonta



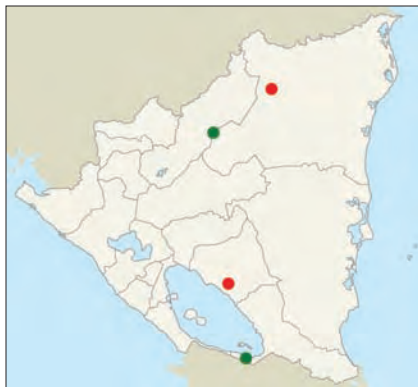
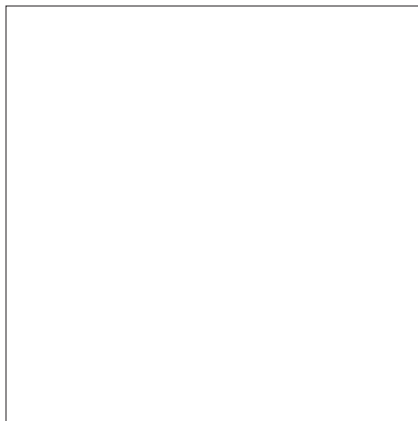
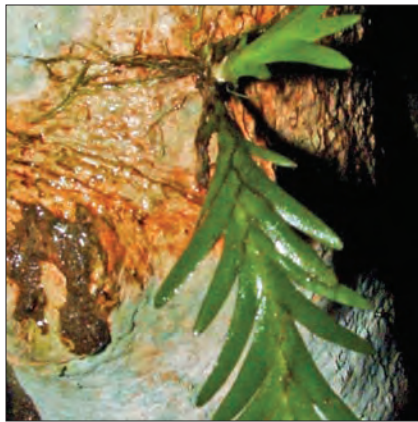
Lockhartia micrantha



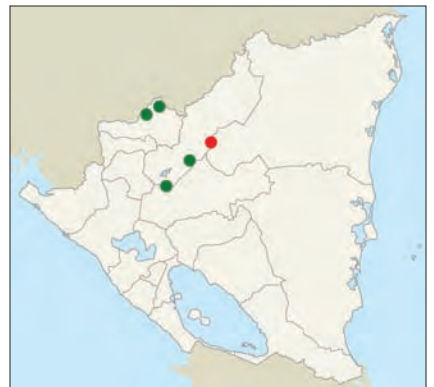
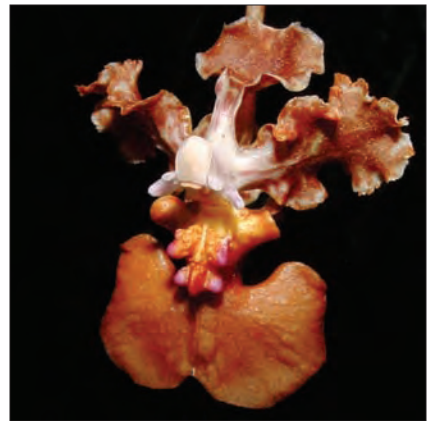
Lockhartia oerstedii



Lockhartia pittieri



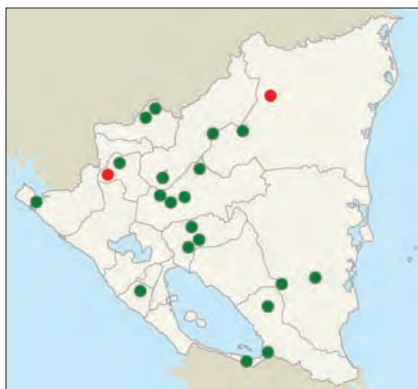
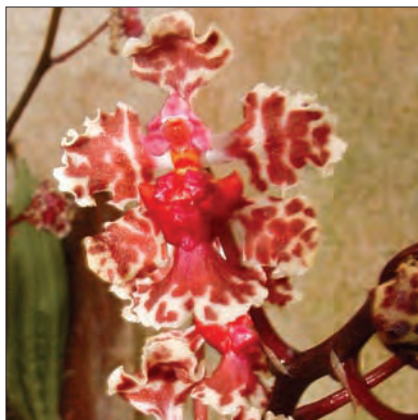
Lophiaris altissimum



Lophiaris aurisasinorum



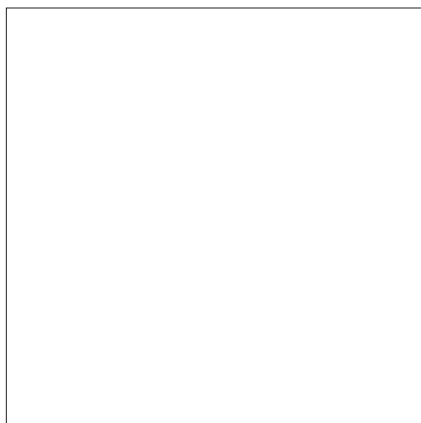
Lophiaris carthagenense



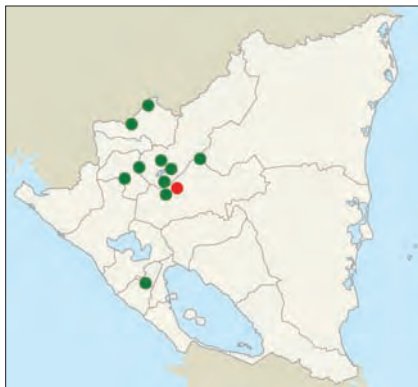
Lophiaris luridum



Lycaste angelae



Lycaste aromatica



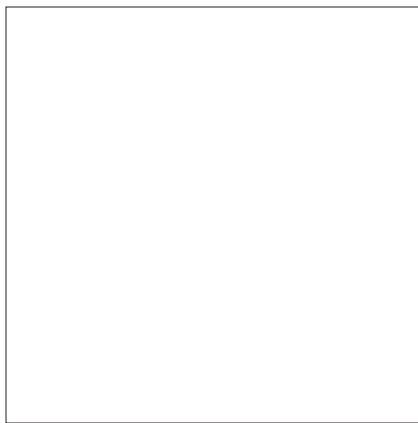
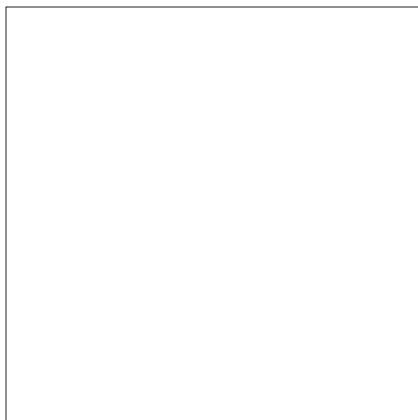
Lycaste bradeorum



Lycaste cochleata



Lycaste deppei



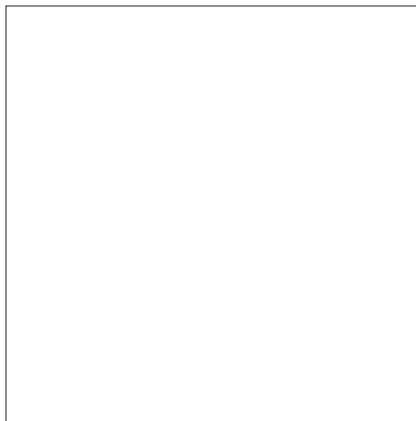
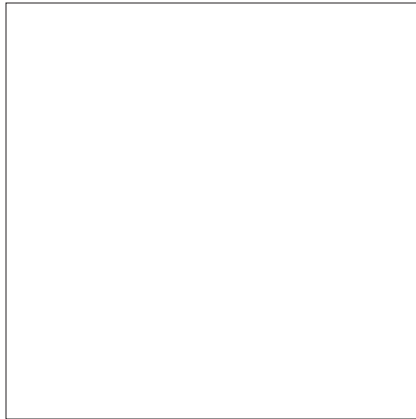
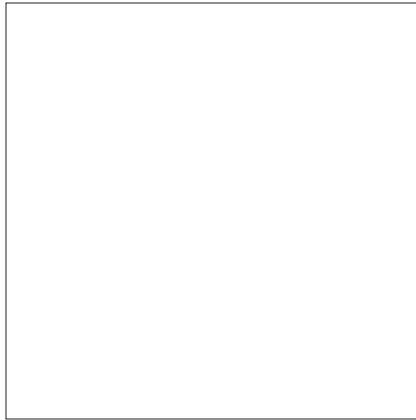
Lycaste dowiana



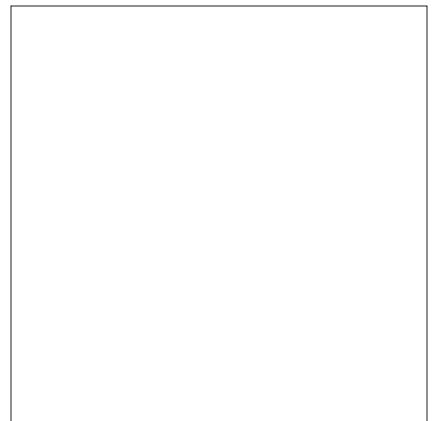
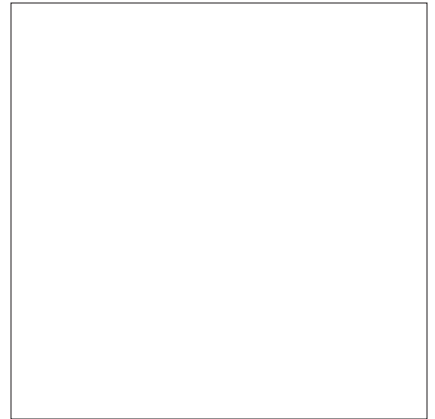
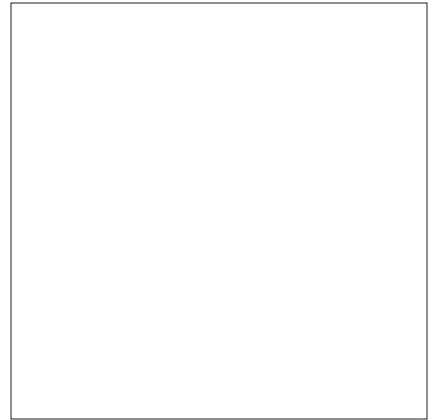
Lycaste macrophylla
desboisiana



Lycaste suaveolens



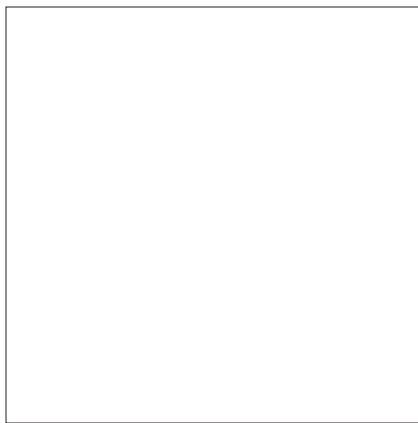
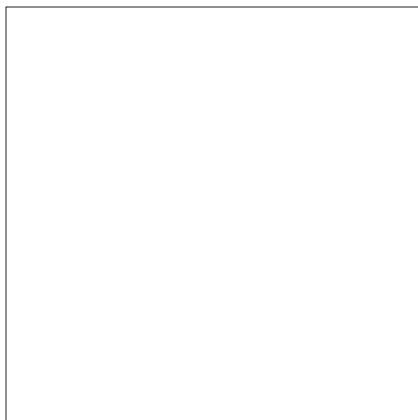
Lyroglossa pubicaulis



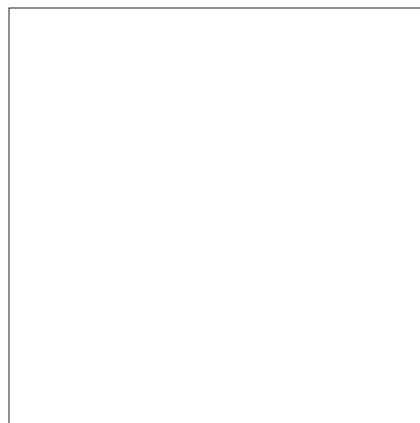
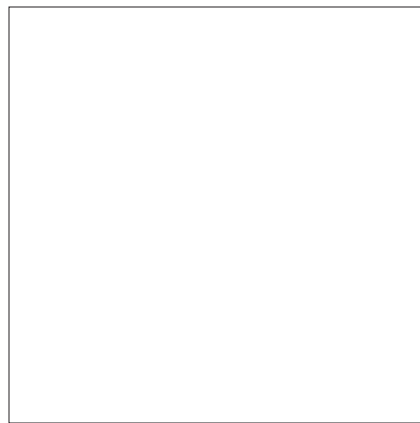
Macradenia brassavolae



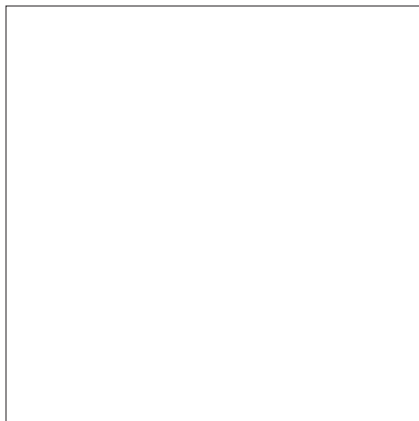
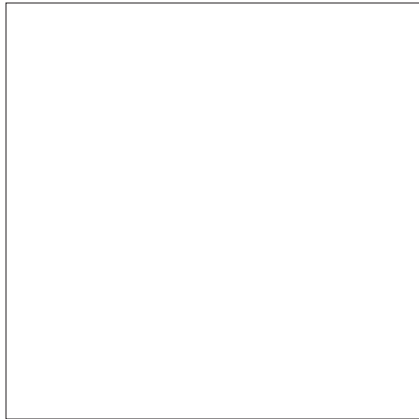
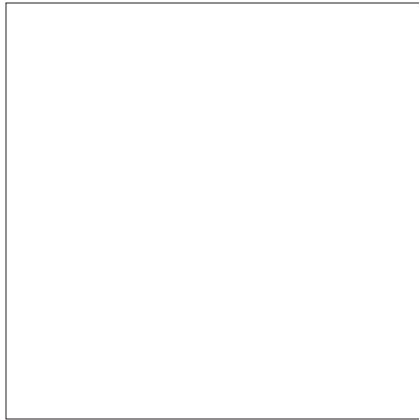
Macroclinium bicolor



Macroclinium paniculatum



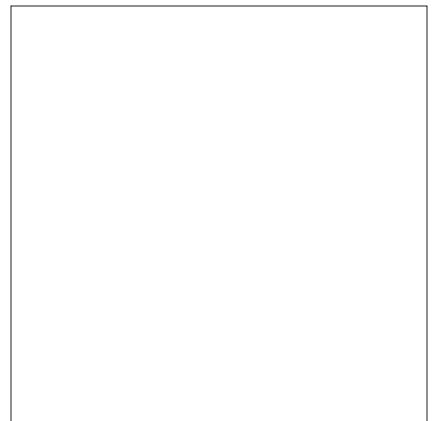
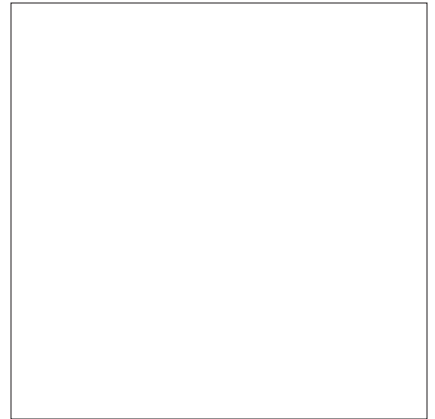
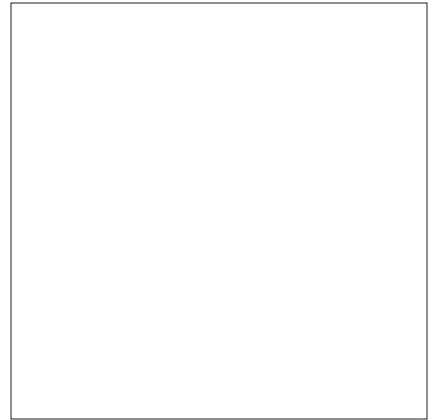
Malaxis aurea



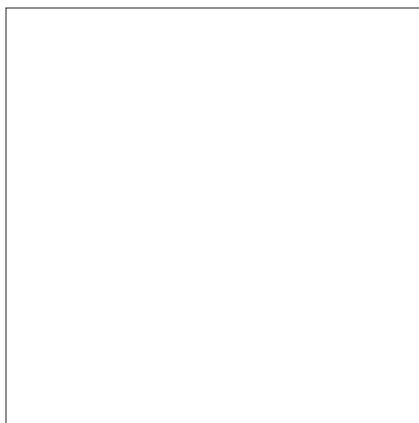
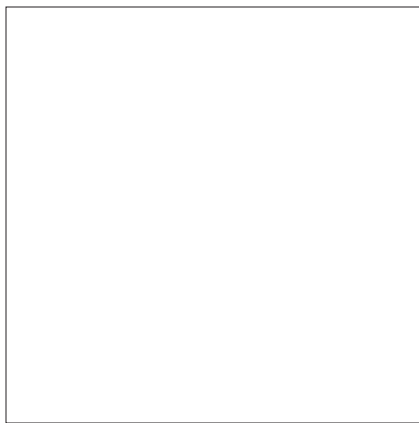
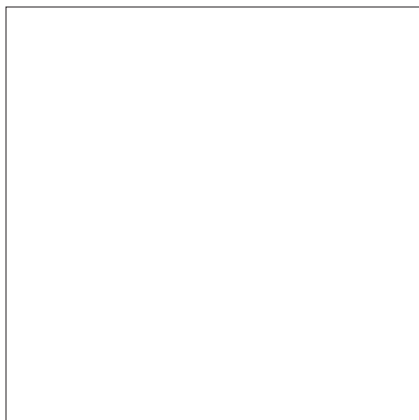
Malaxis brachyrrhynchos



Malaxis brachystachya



Malaxis carnosa



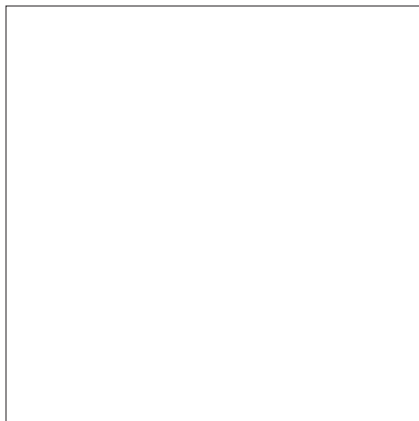
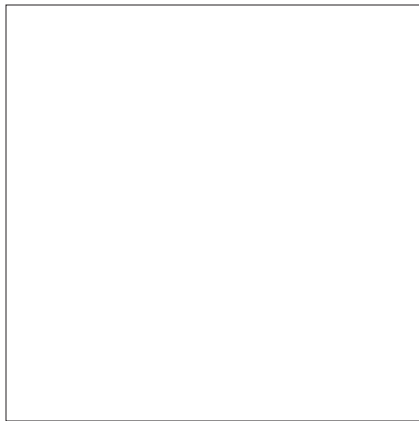
Malaxis excavata



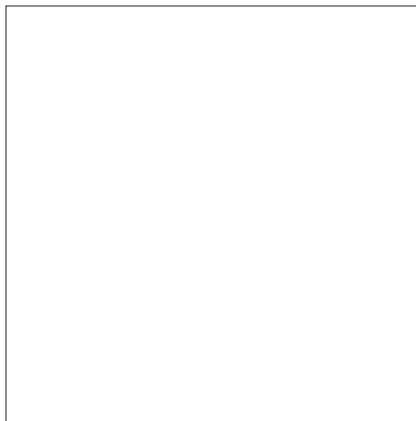
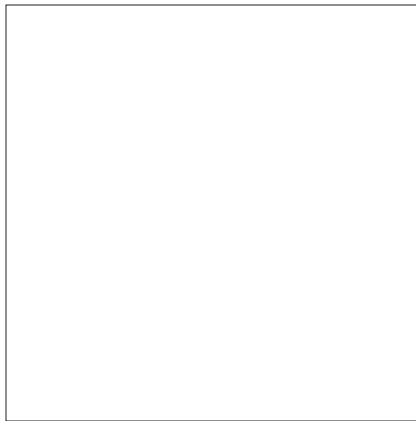
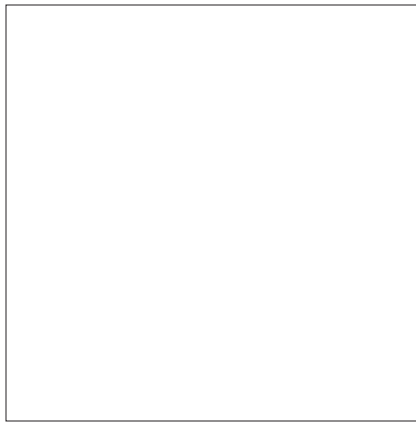
Malaxis fastigiata



Malaxis histionantha



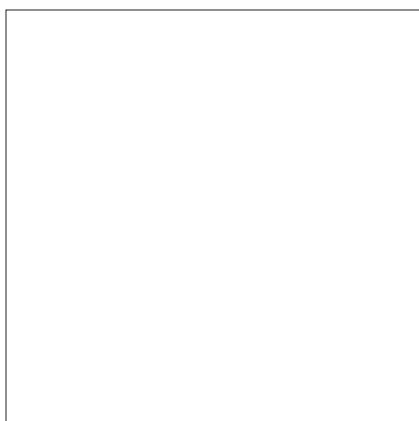
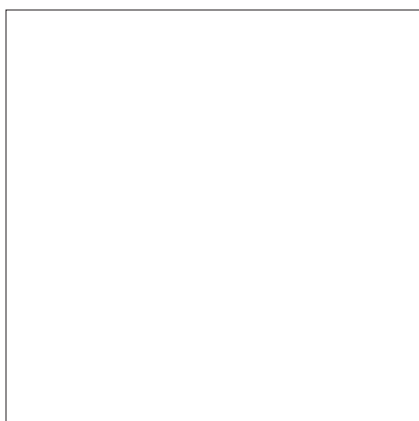
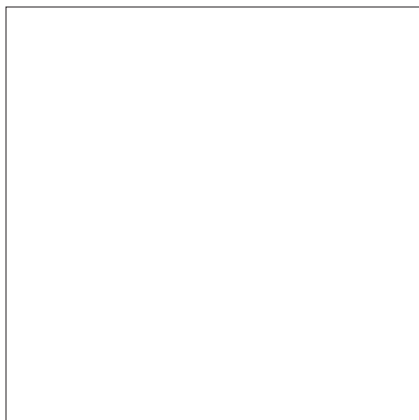
Malaxis majanthemifolia



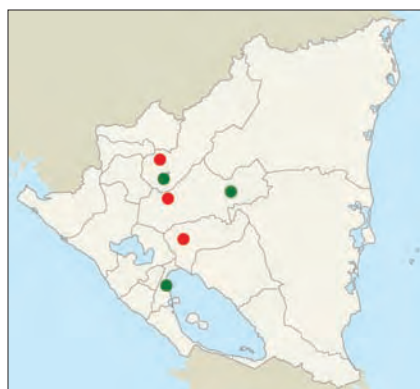
Malaxis soulei



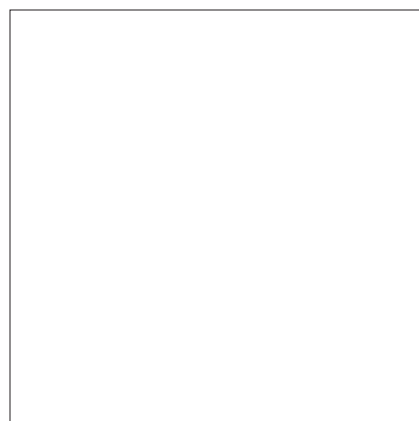
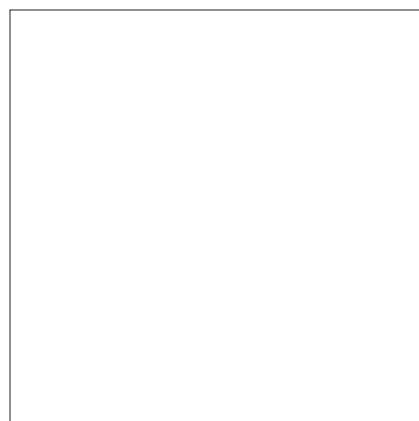
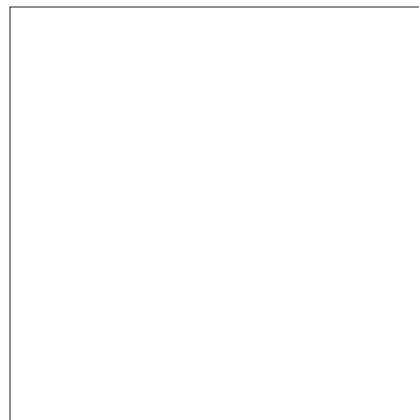
Malaxis unifolia



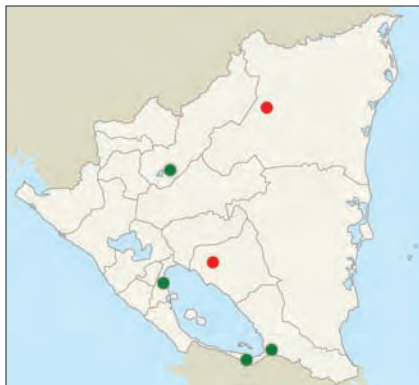
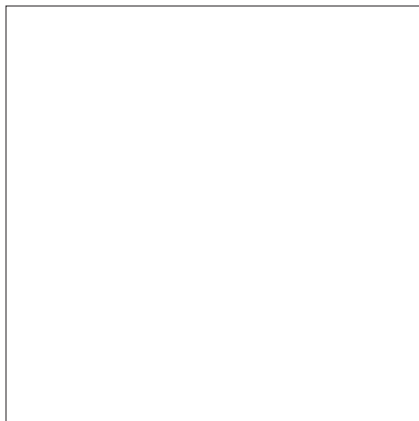
Masdevallia chontalensis



Masdevallia molossoides



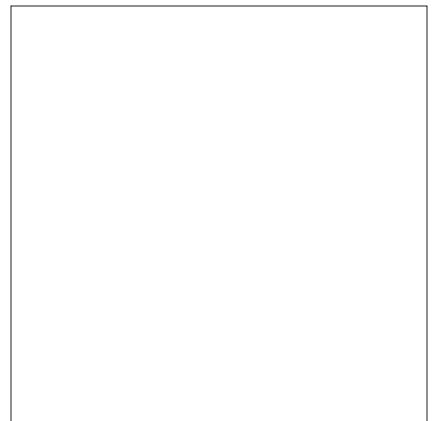
Masdevallia nicaraguey



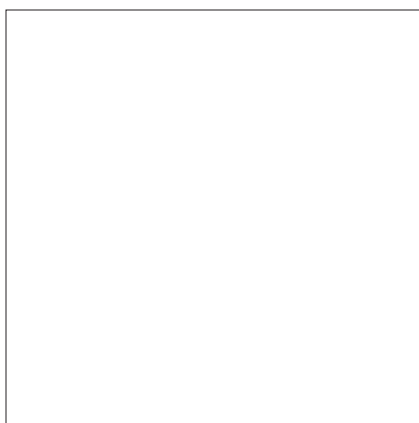
Masdevallia nidifica



Masdevallia tonduzii



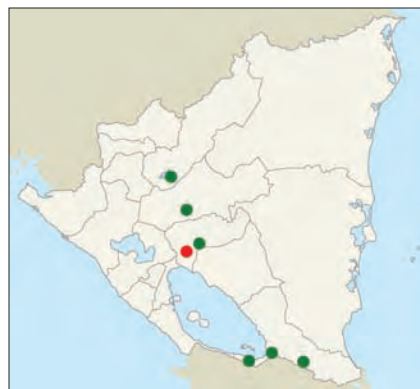
Masdevallia tubuliflora



Maxillaria acervata



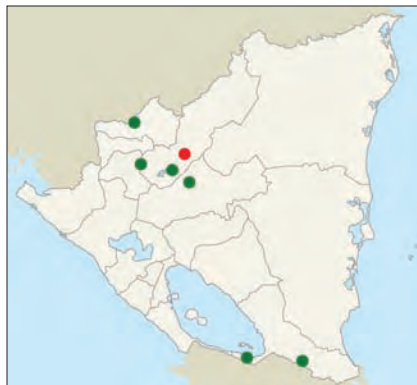
Maxillaria aciantha



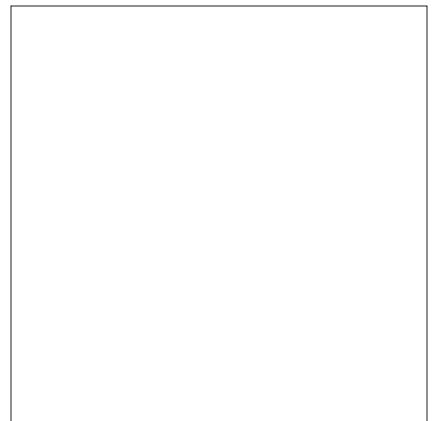
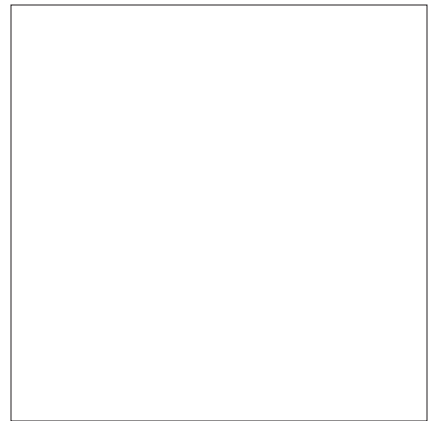
Maxillaria alba



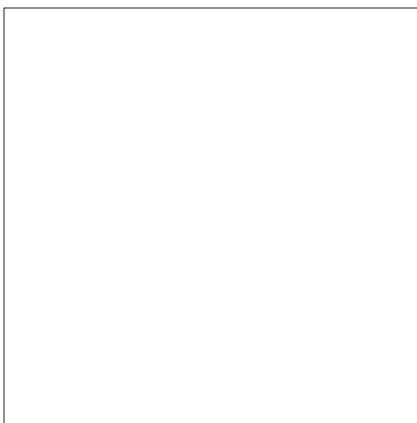
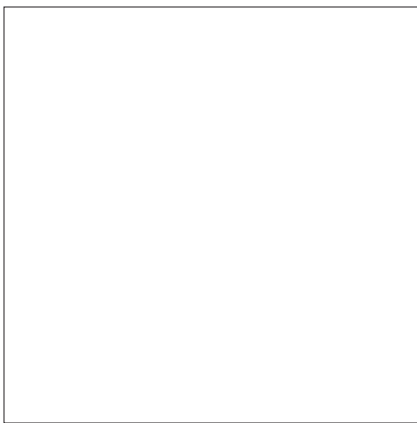
Maxillaria anceps



Maxillaria angustisegmenta



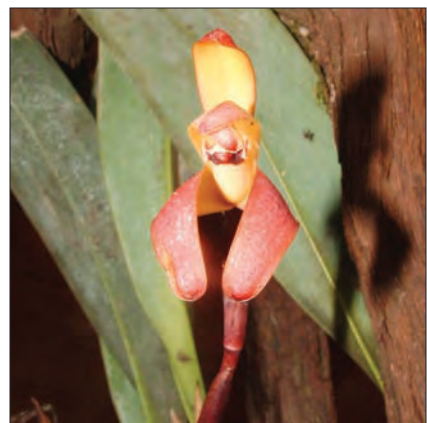
Maxillaria angustissima



Maxillaria brachybulbon



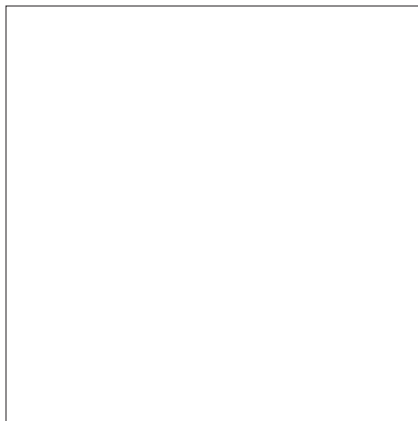
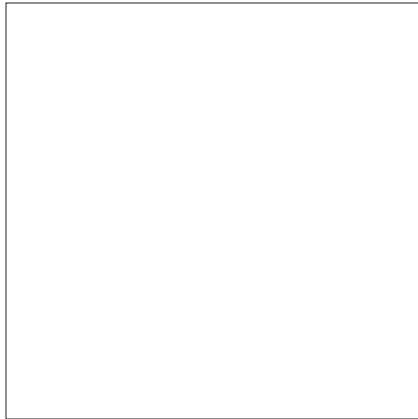
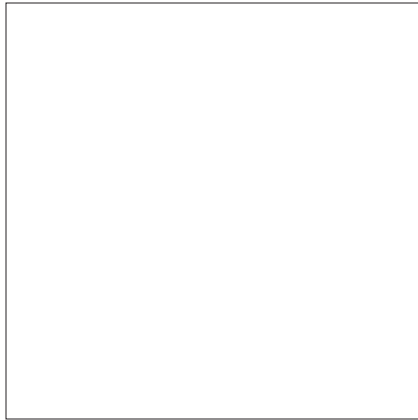
Maxillaria brunnea



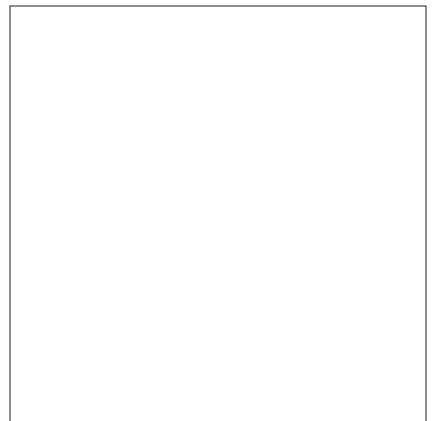
Maxillaria caespitifica



Maxillaria cobanensis



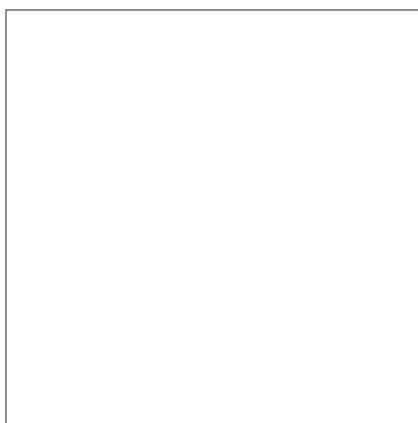
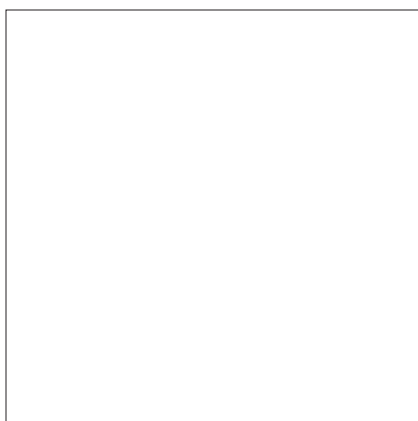
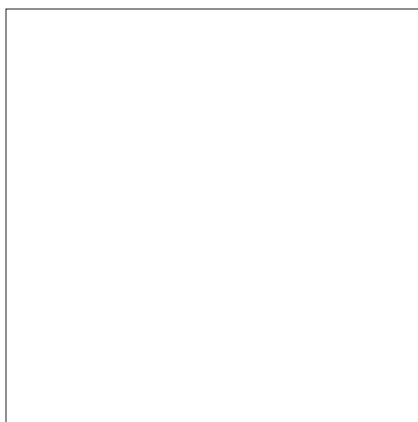
Maxillaria confusa



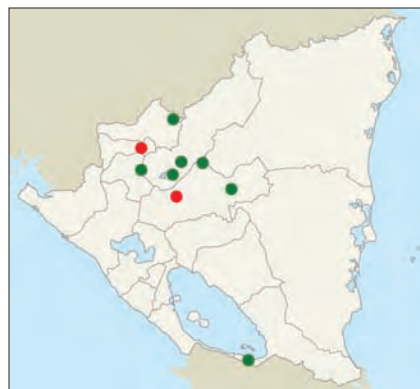
Maxillaria cucullata



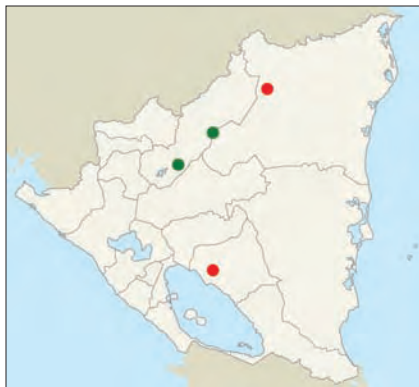
Maxillaria curtipes



Maxillaria densa



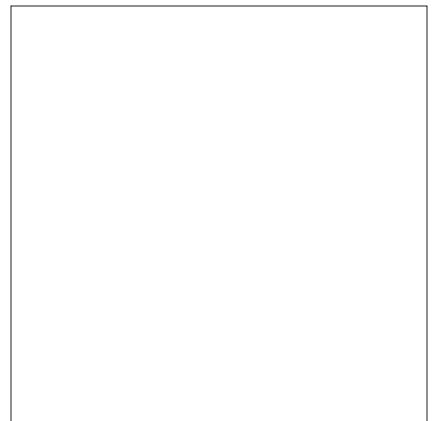
Maxillaria diuturna



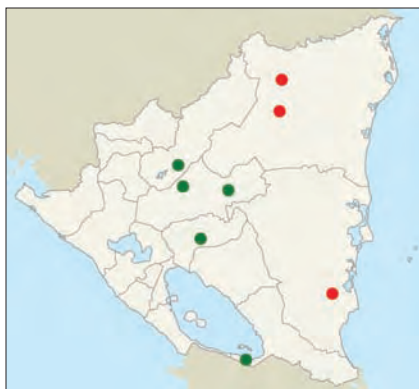
Maxillaria elatior



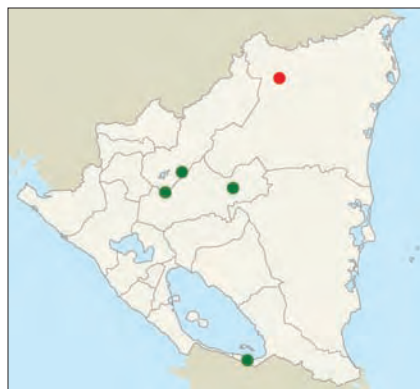
Maxillaria endresii



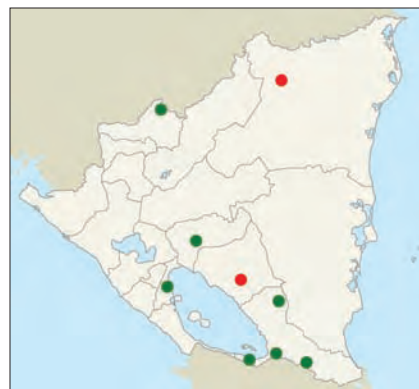
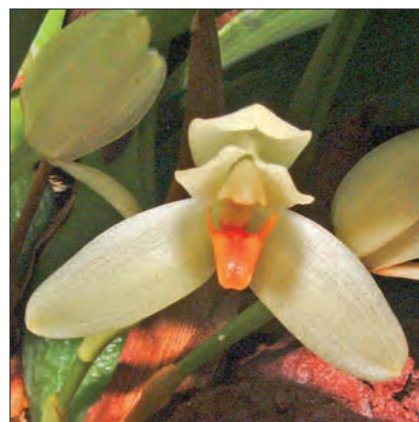
Maxillaria friedrichsthalii



Maxillaria fulgens



Maxillaria hedwigae



Maxillaria mombachoensis



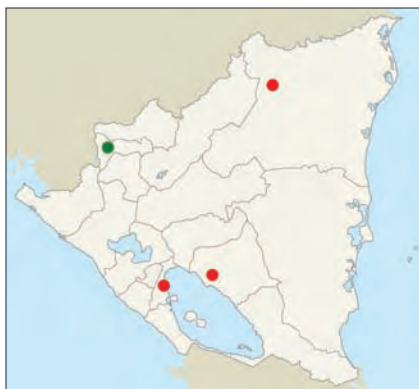
Maxillaria moralesii



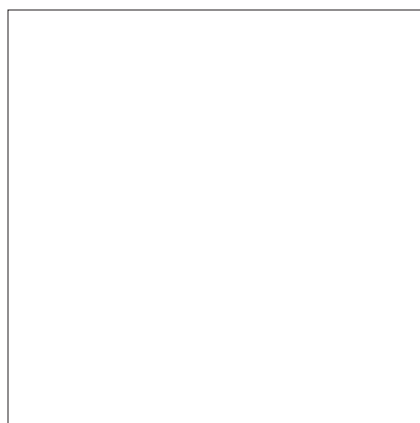
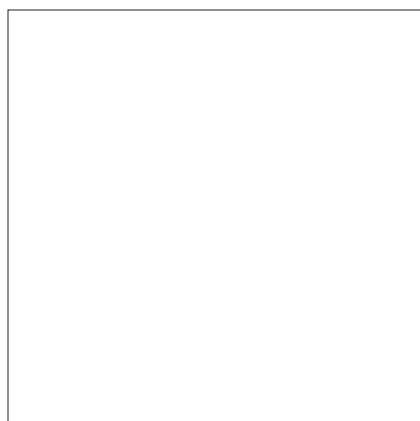
Maxillaria nasuta



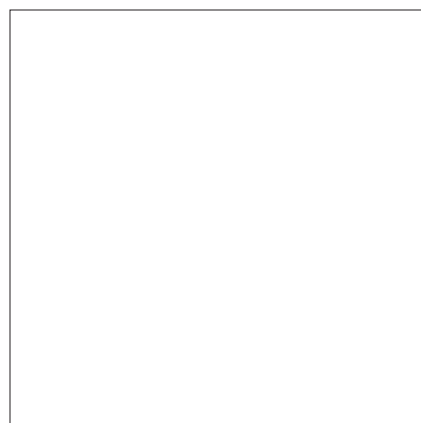
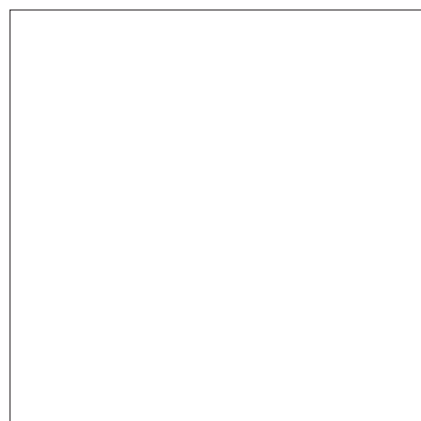
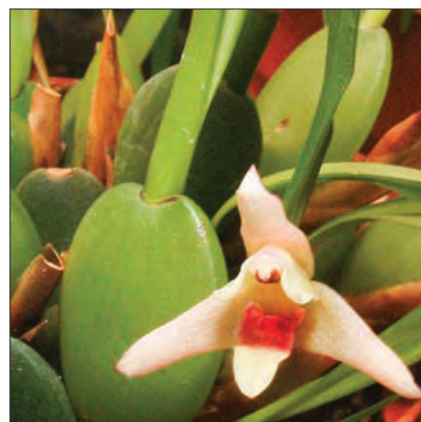
Maxillaria neglecta



Maxillaria nicaraguensis



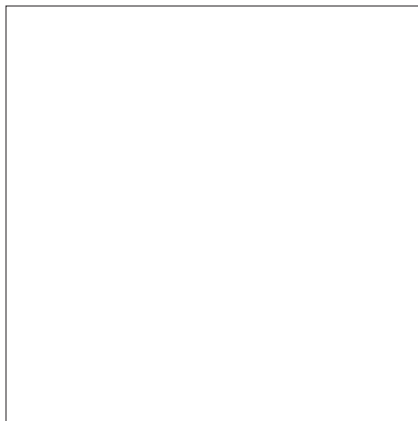
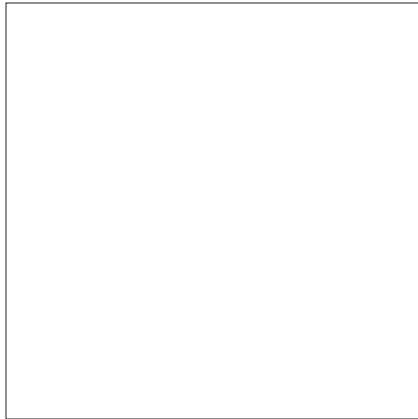
Maxillaria oreocharis



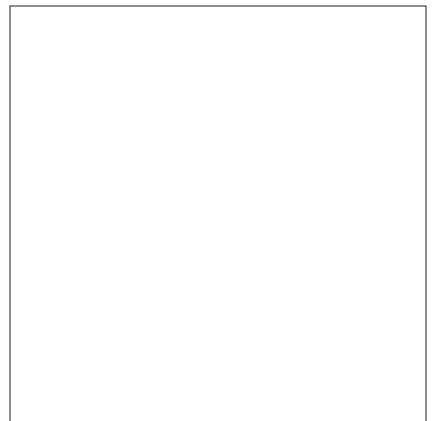
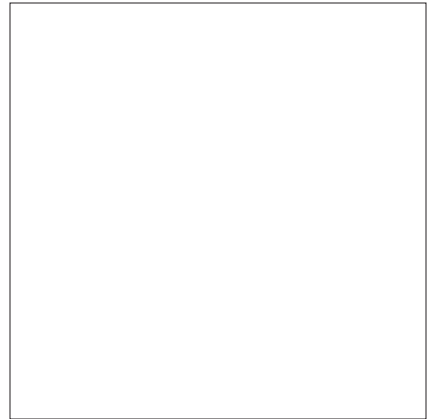
Maxillaria pachyacron



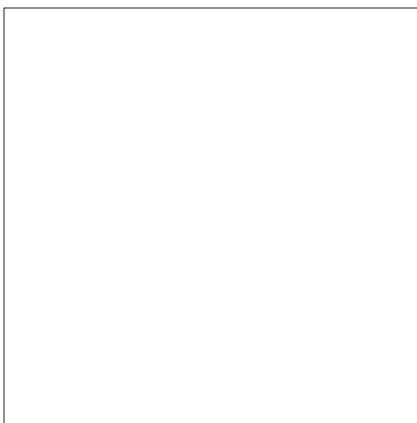
Maxillaria paleata



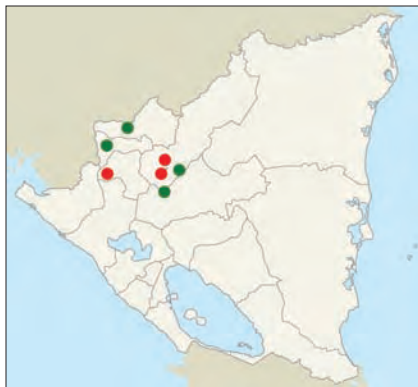
Maxillaria porrecta



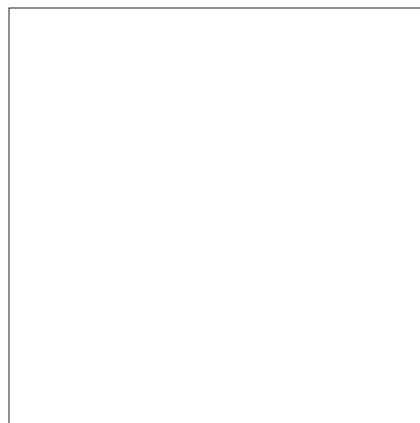
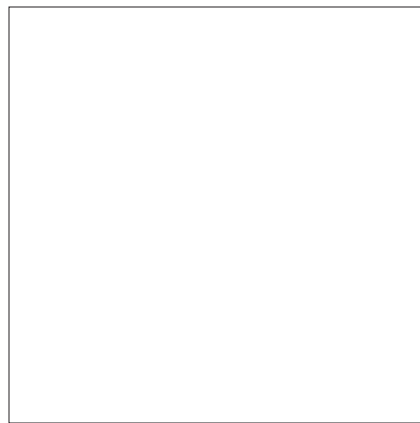
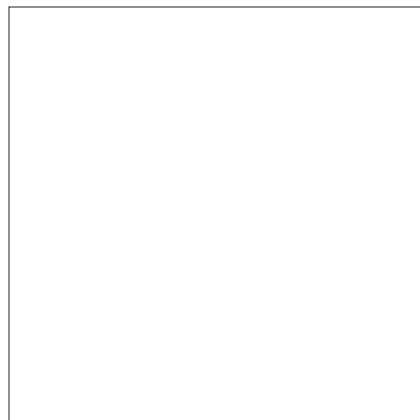
Maxillaria praestans



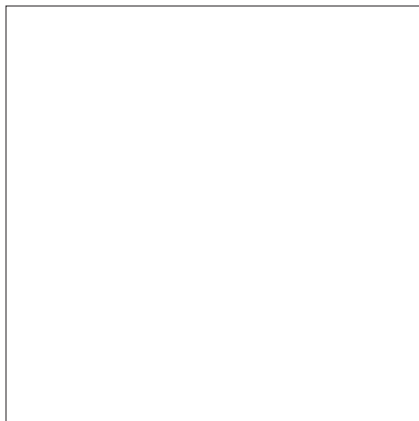
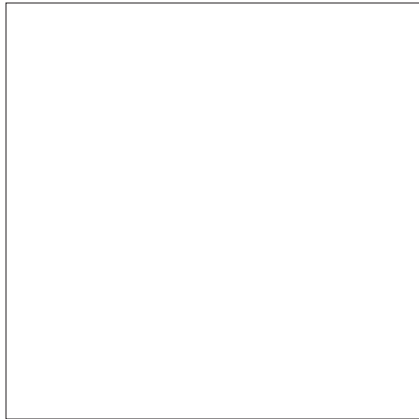
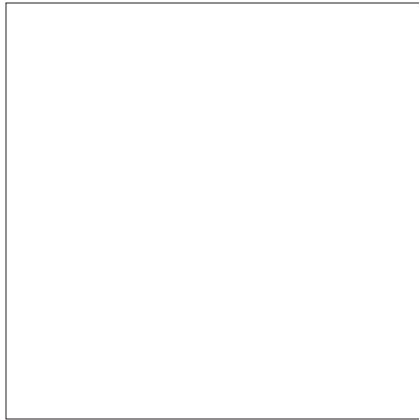
Maxillaria punctostriata



Maxillaria ramonensis



Maxillaria ramosa



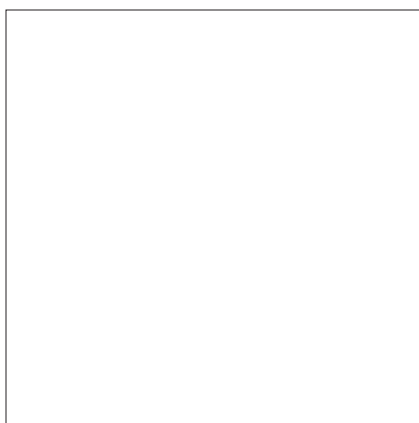
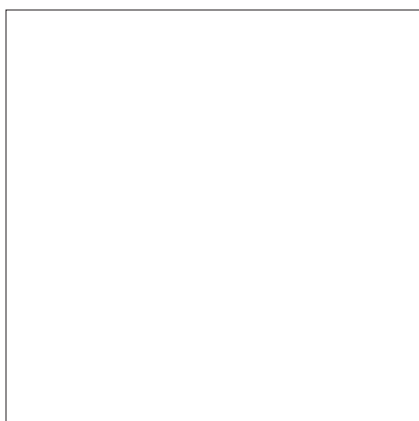
Maxillaria reichenheimiana



Maxillaria ringens



Maxillaria rufescens



Maxillaria sanguinea



Maxillaria schlechteriana



Maxillaria sigmoidea



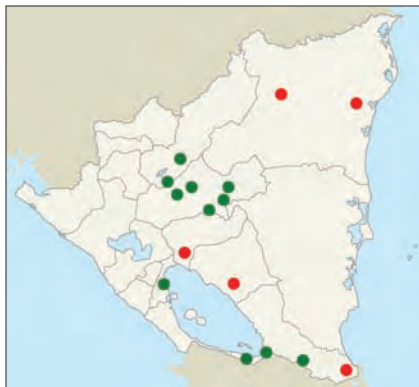
Maxillaria tenuifolia



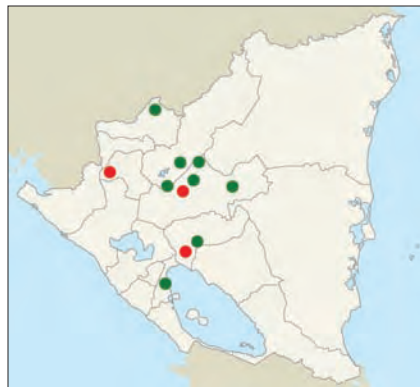
Maxillaria tigrina



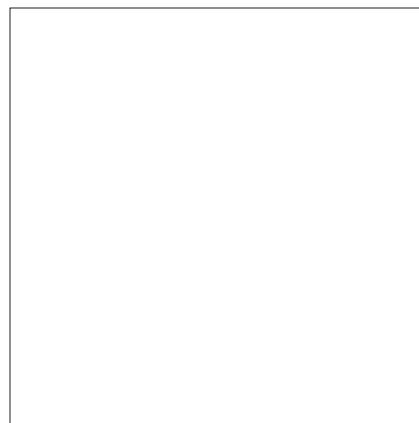
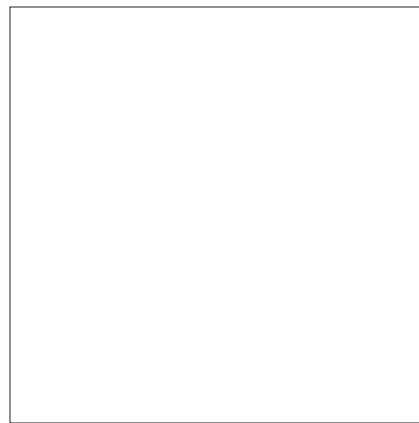
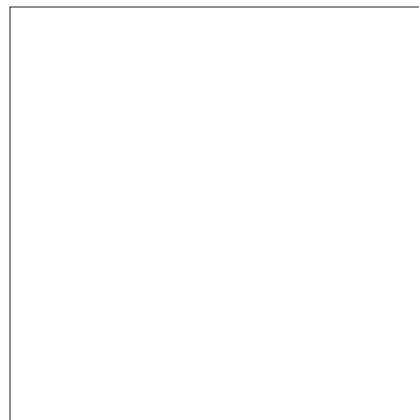
Maxillaria uncata



Maxillaria variabilis



Mesadenella tonduzii



Mesospinidium warscewiczii



Microchilus querticola



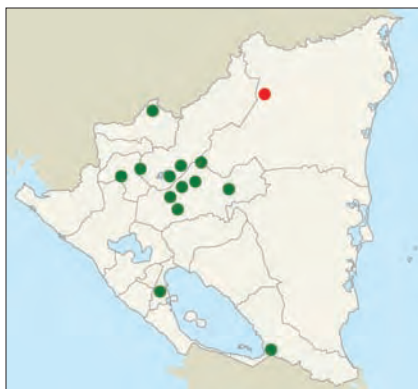
Monophyllorchis microstyloides



Mormodes doderoi



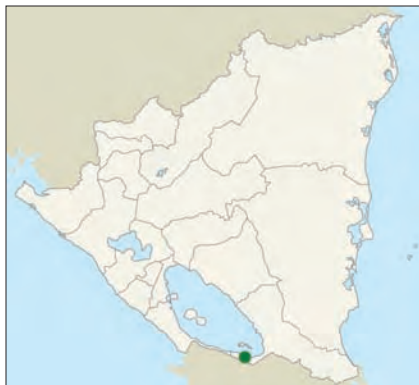
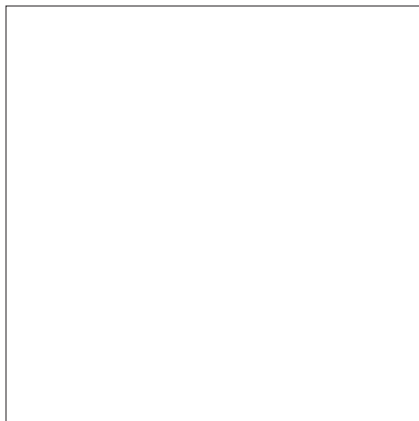
Mormodes horichii



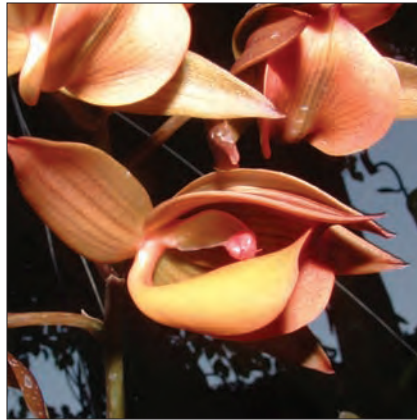
Mormodes horichii ssp. *helleri*



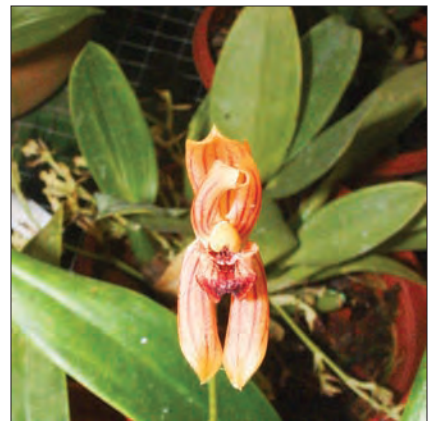
Mormodes skinneri



Mormodes sotoana



Mormolyca ringens



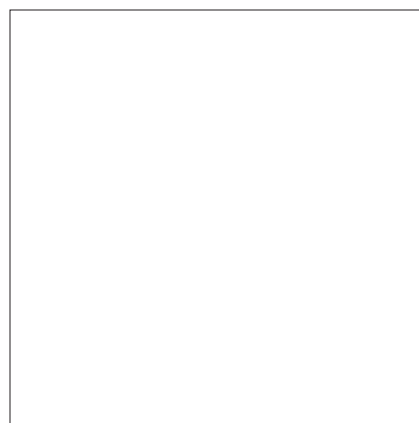
Myoxanthus hirsuticaulis



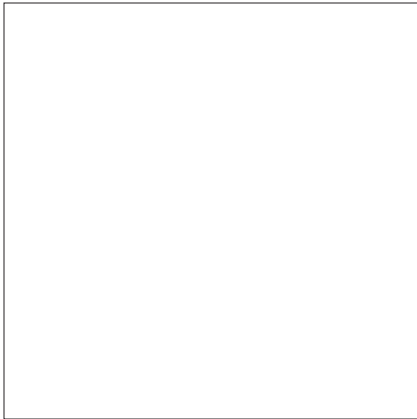
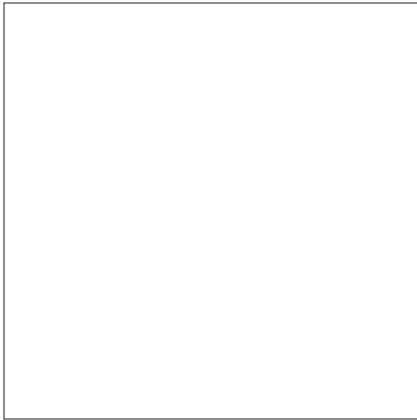
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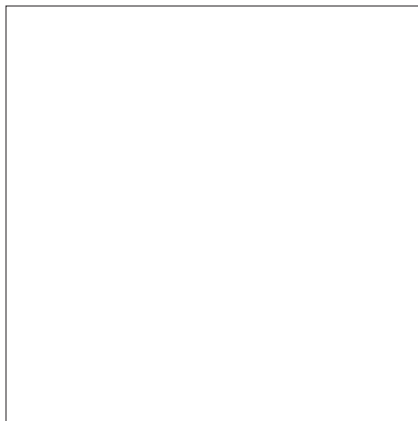
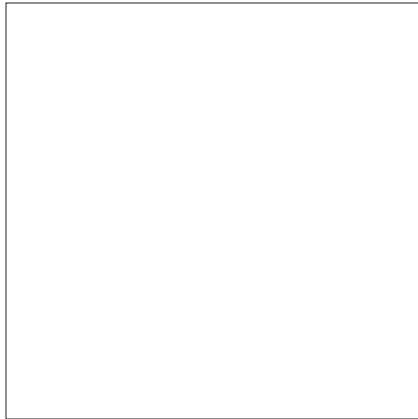
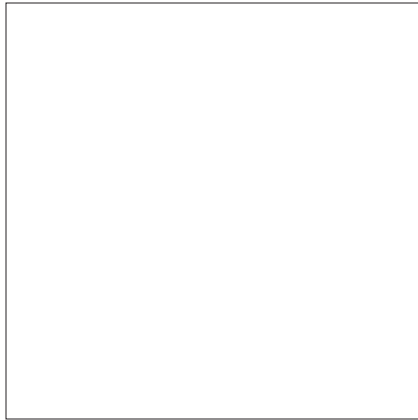
Myoxanthus scandens



Myoxanthus speciosus



Myoxanthus trachychlamys



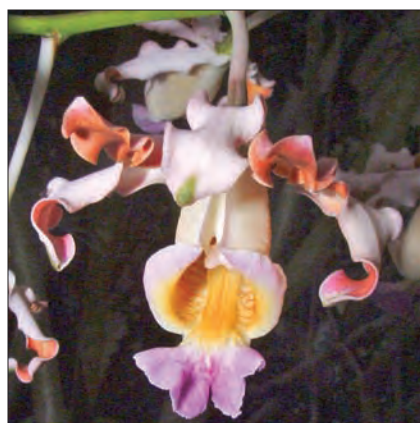
Myrmecophila brysiana



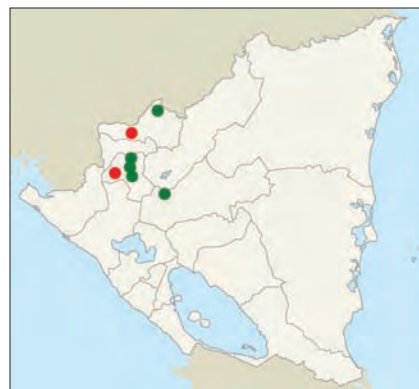
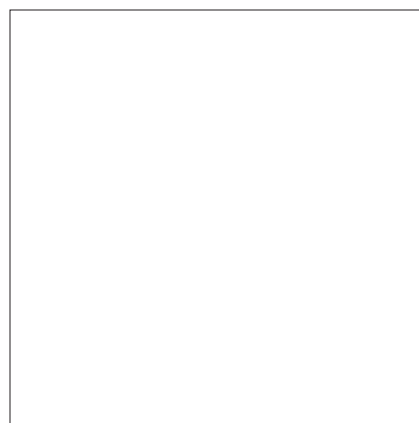
Myrmecophila christinae



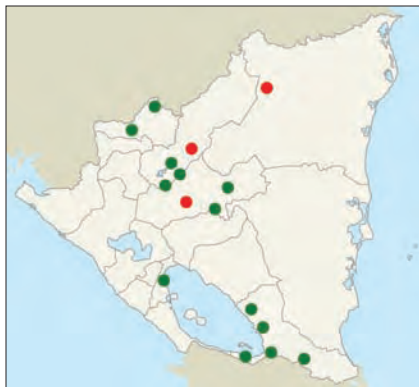
Myrmecophila tibicinis



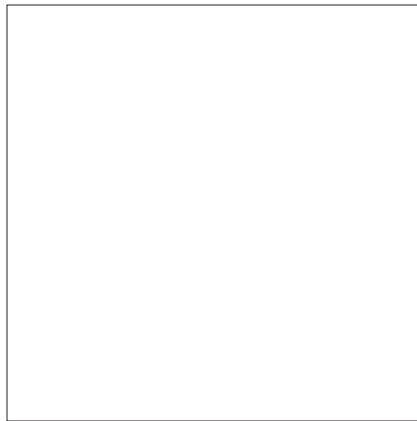
Myrmecophila wendlandii



Nidema boothii



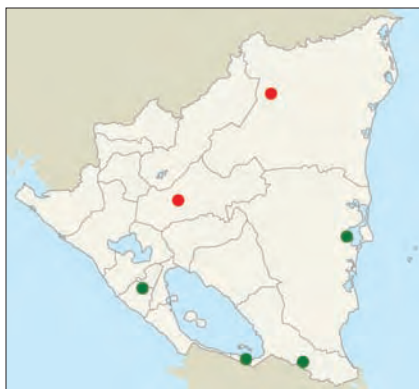
Nidema ottonis



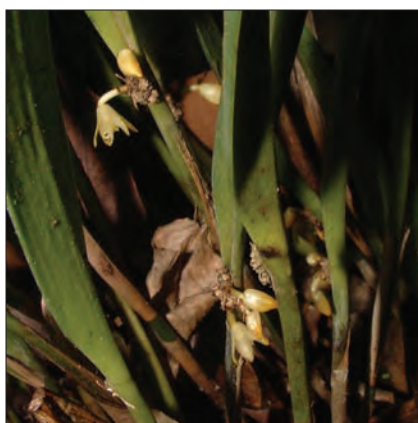
Notylia pentachne



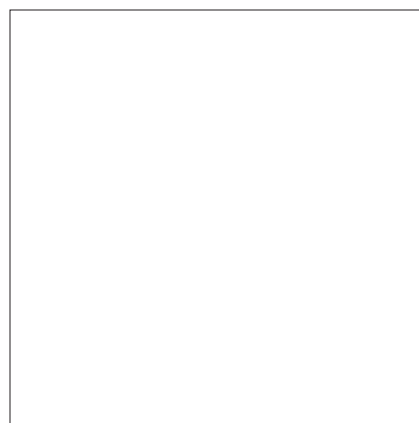
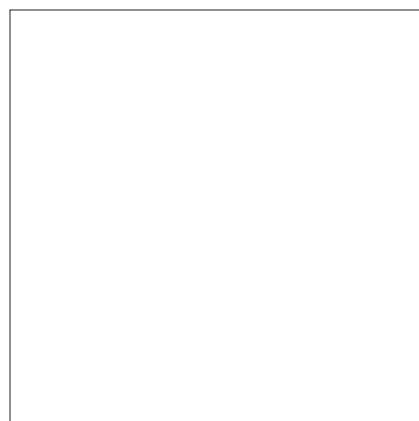
Notylia trisepala



Octomeria costarricensis



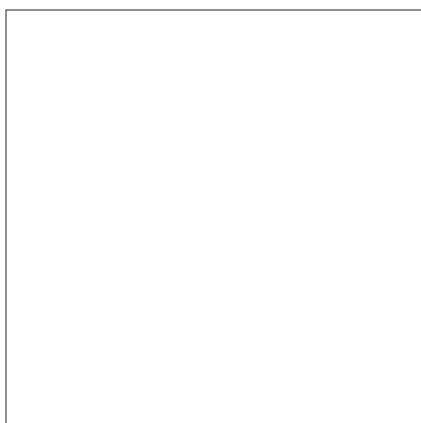
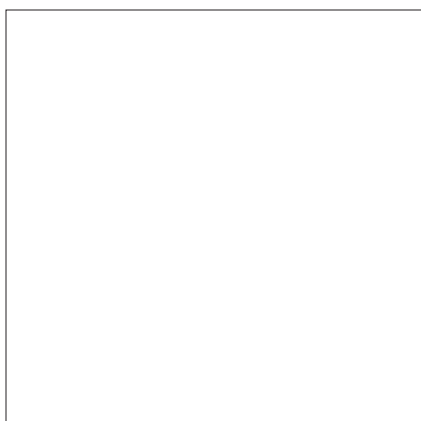
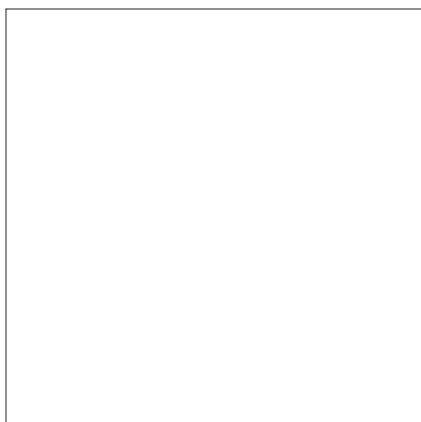
Octomeria graminifolia



Oeceoclades maculata



Oerstedella aberrans



Oestlundia luteorosea



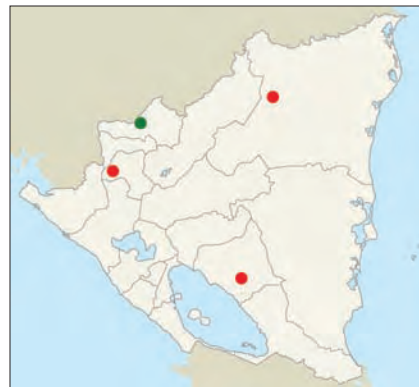
Oncidium bracteatum



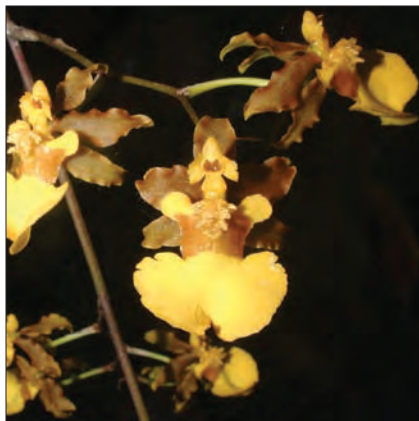
Oncidium cheirophorum



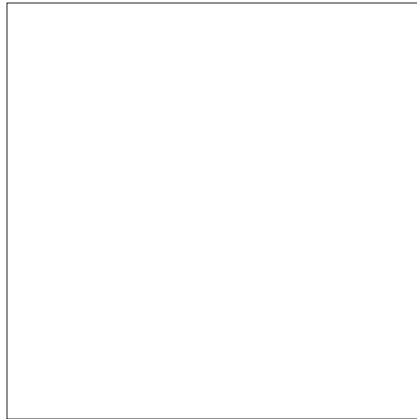
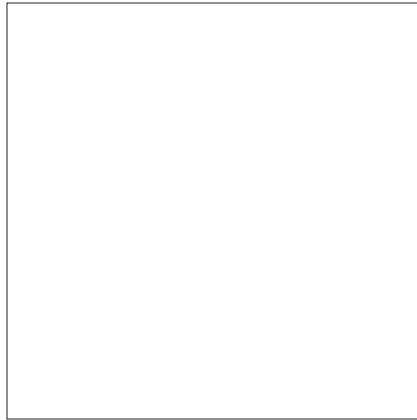
Oncidium cheirophorum var *excauriculatum*



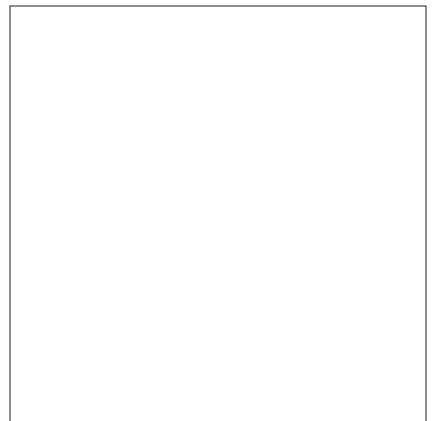
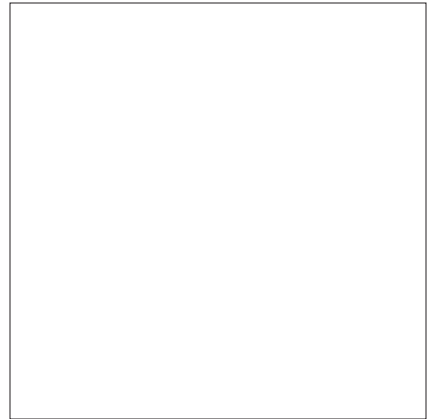
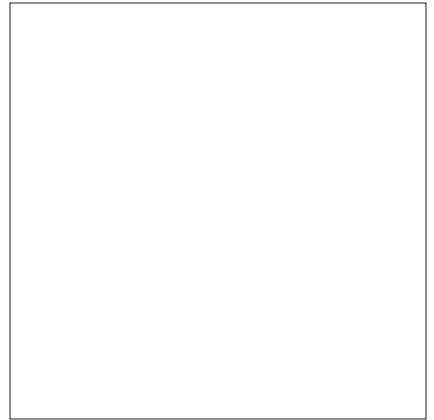
Oncidium ensatum



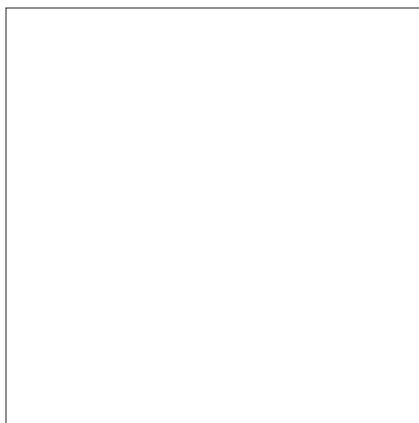
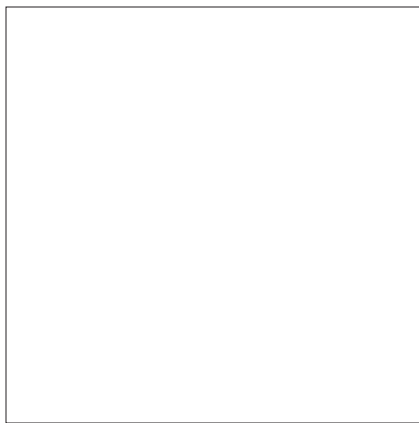
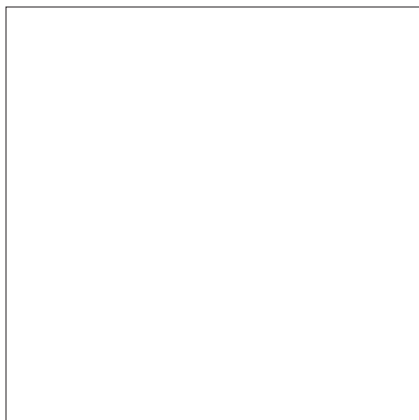
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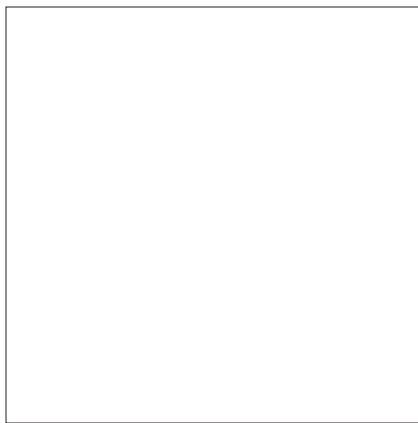
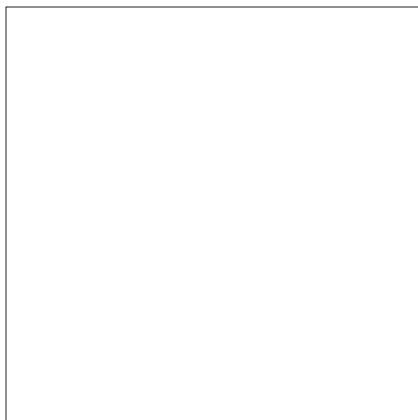
Oncidium incurvum



Oncidium maculatum



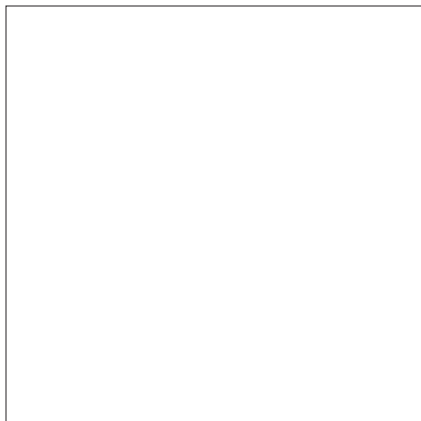
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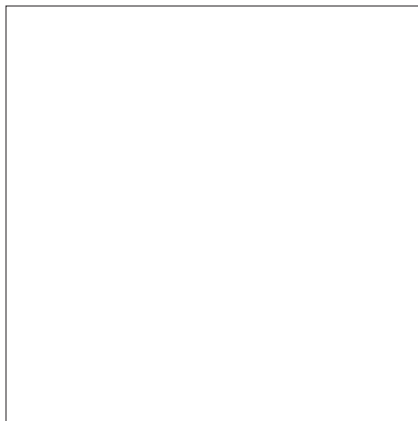
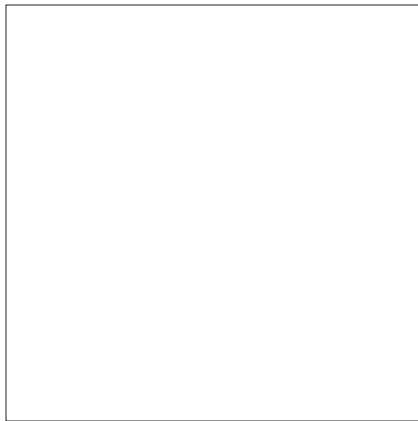
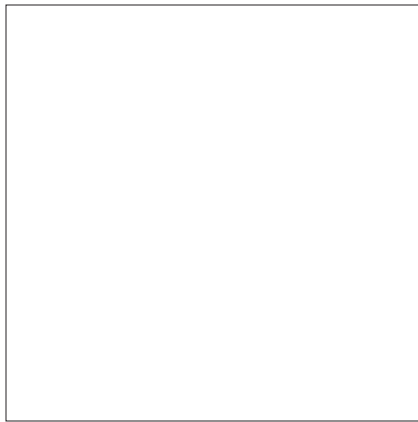
Oncidium oliganthum



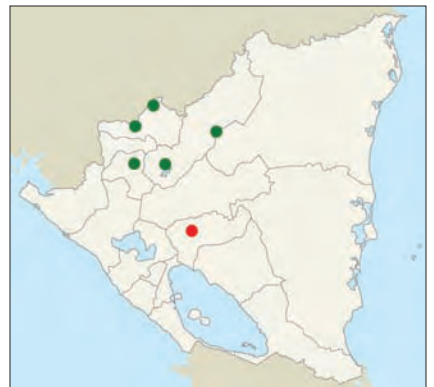
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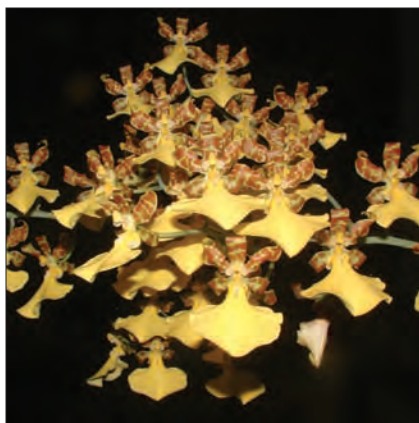
Oncidium planilabre



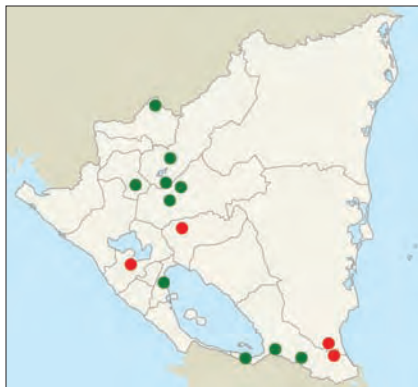
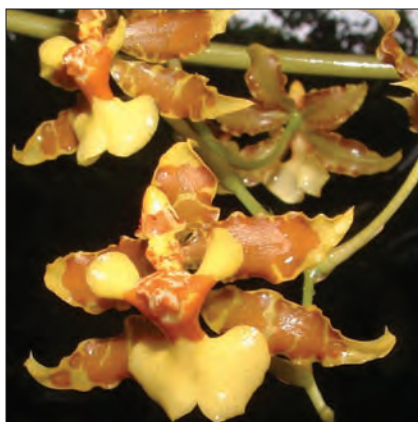
Oncidium sphacelatum



Oncidium splendidum



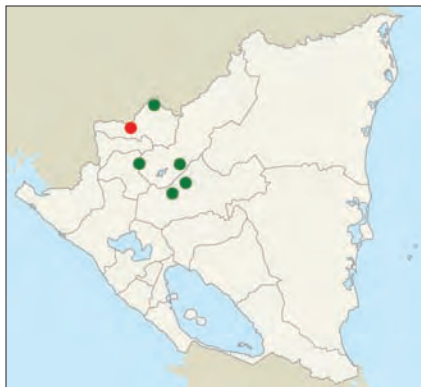
Oncidium stenotis



Ornithocephalus bicornis



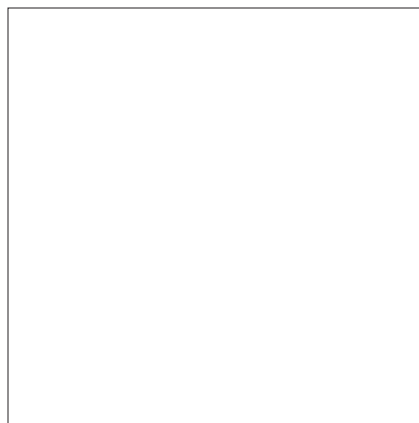
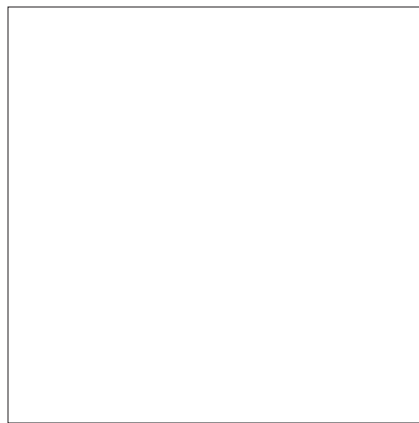
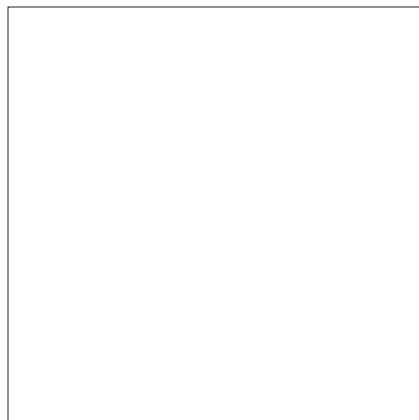
Ornithocephalus gladiatus



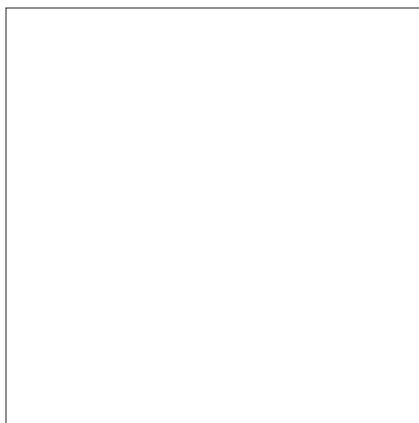
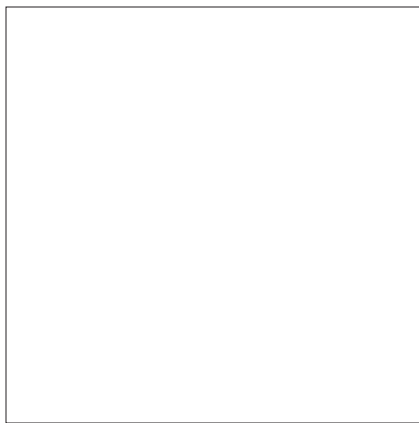
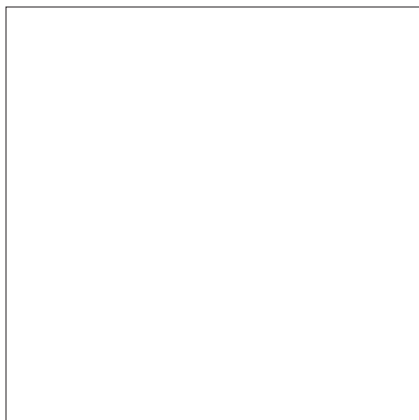
Ornithocephalus inflexus



Osmoglossum anceps



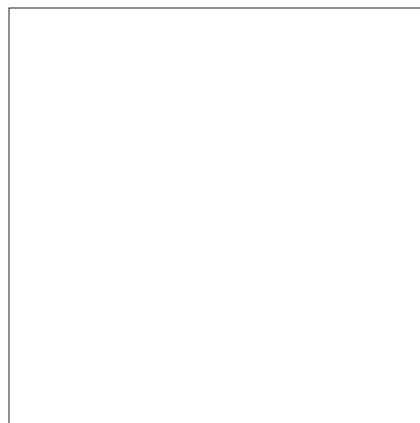
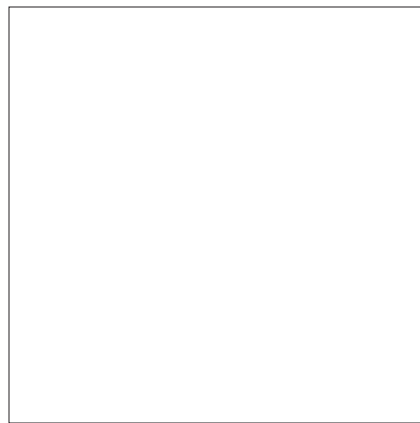
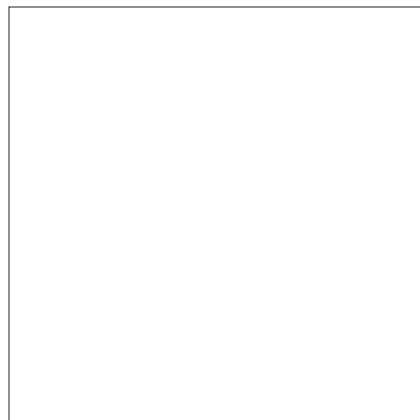
Pachystele minuta



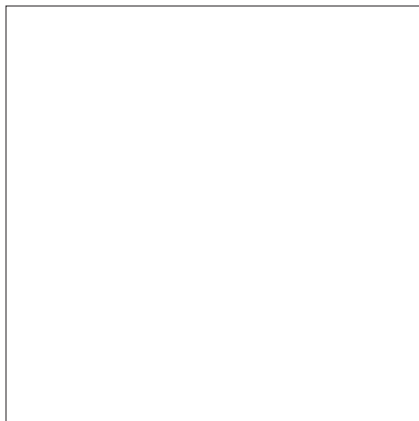
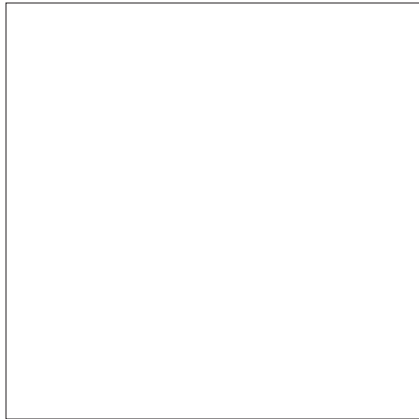
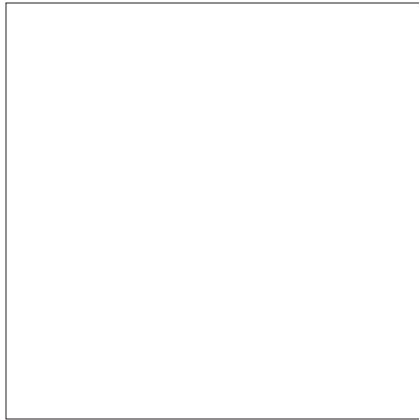
Palmorchis silvicola



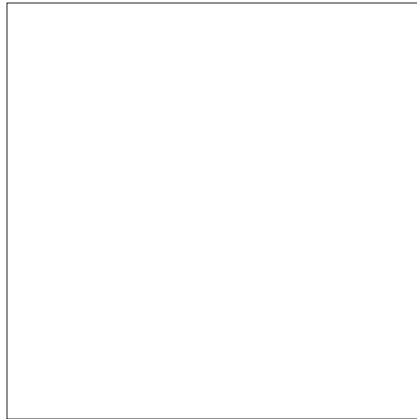
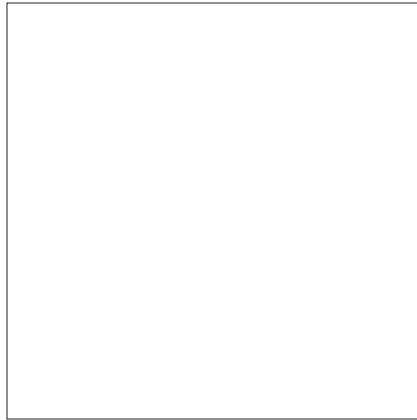
Pelexia congesta



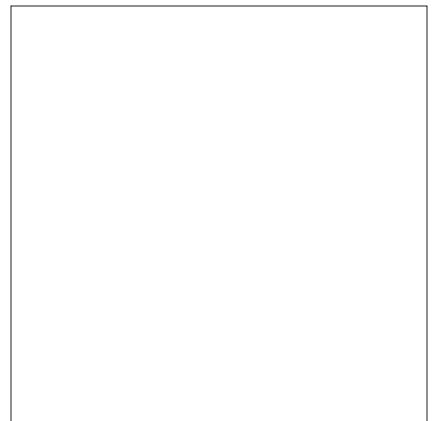
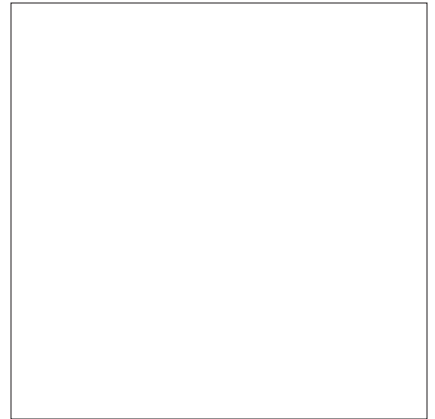
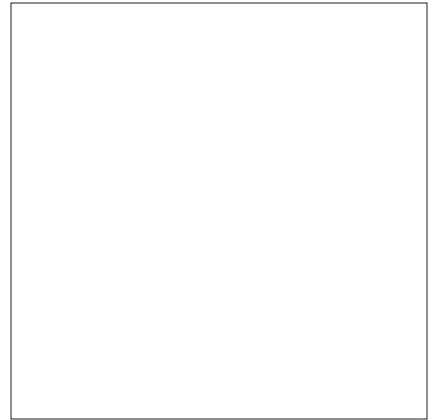
Pelexia funckiana



Pelexia laxa



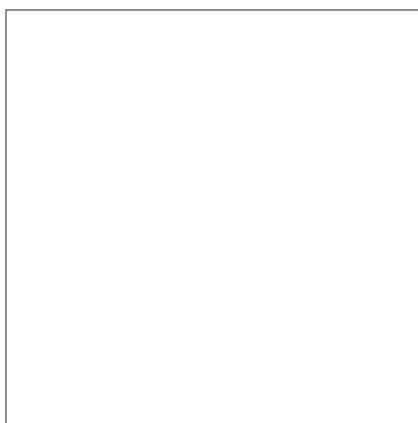
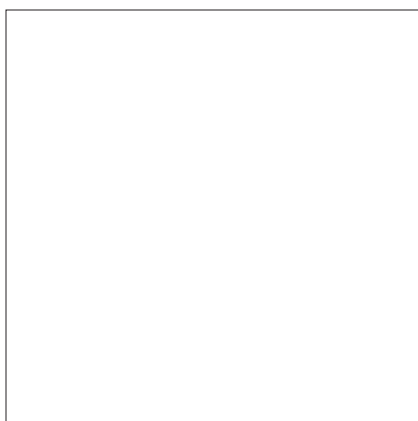
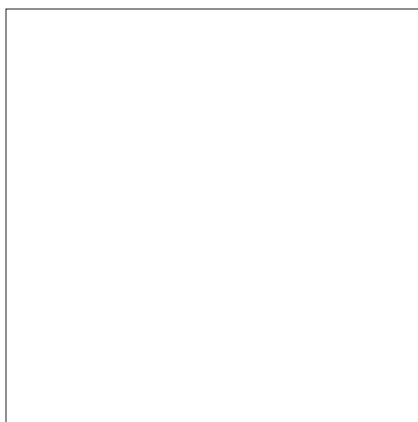
Pelexia smithii



*Phragmepedium
existaminodium*



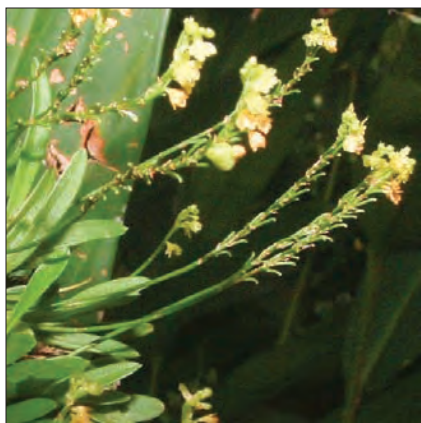
Physoiphon deregularis



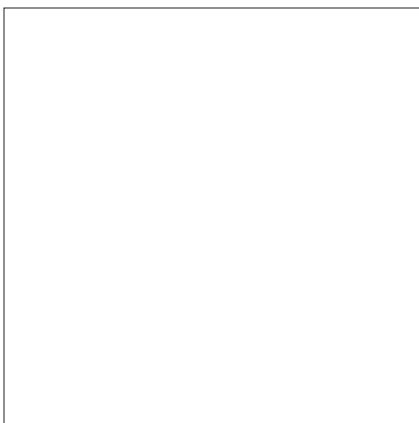
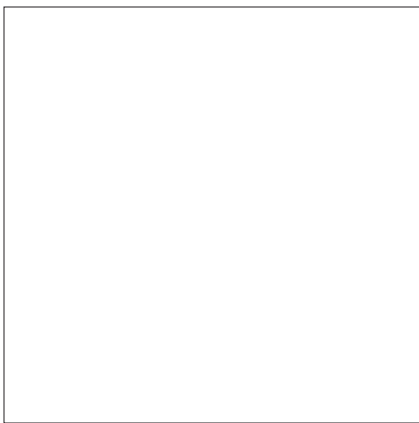
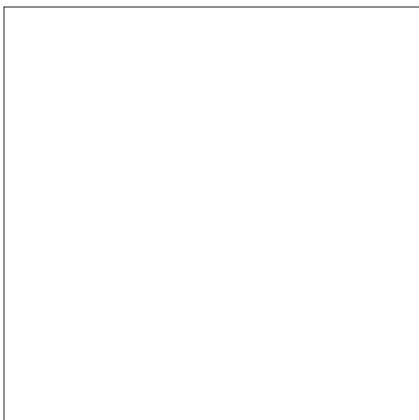
Physoiphon tubulus



Platystele compacta



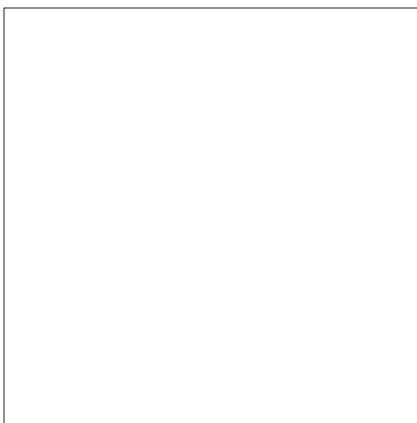
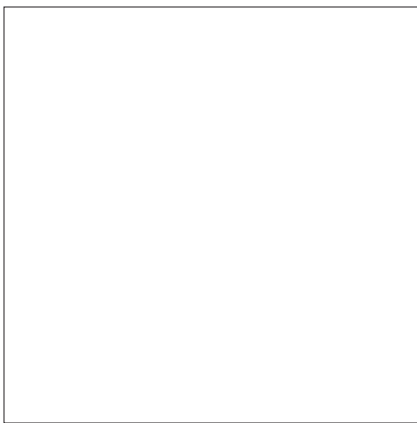
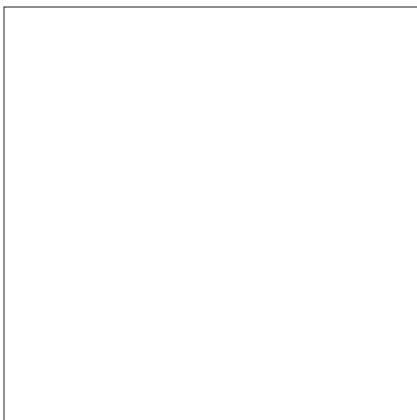
Platystele lancilabris



Platystele stenostachya



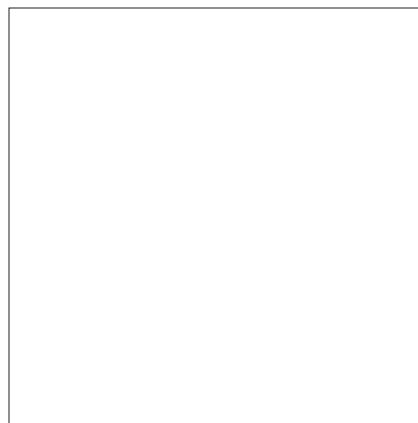
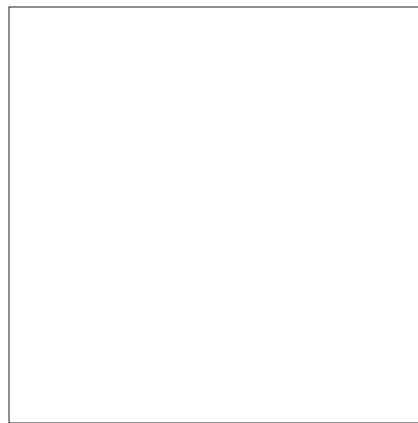
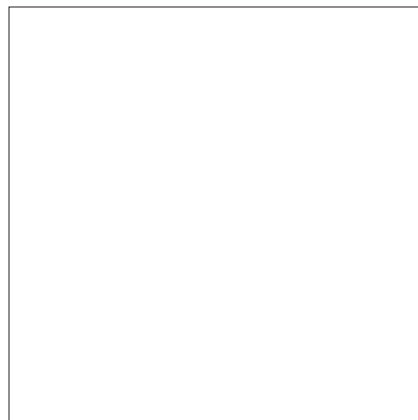
Platythelys vaginata



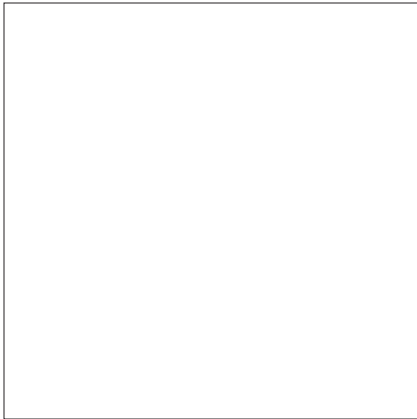
Platythelys venustula



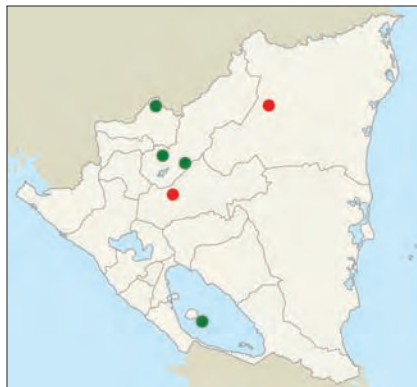
Pleurothallis angustifolia



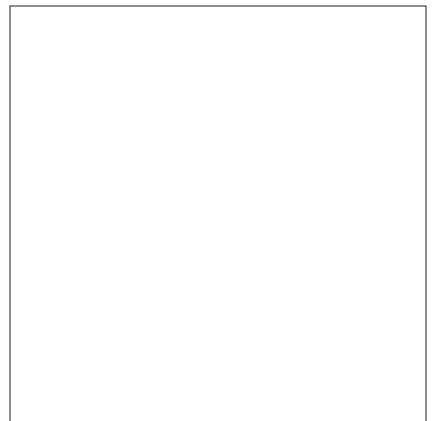
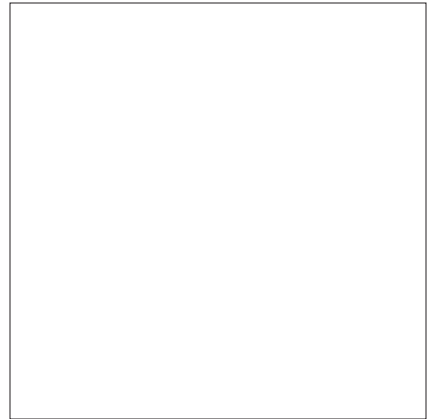
Pleurothallis barbulata



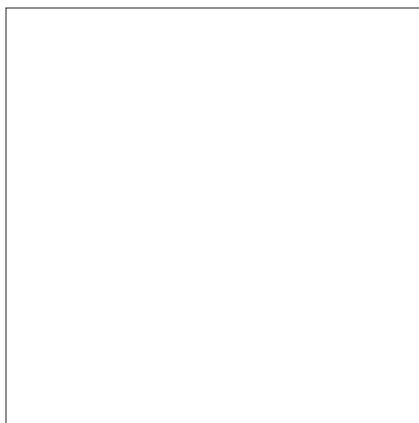
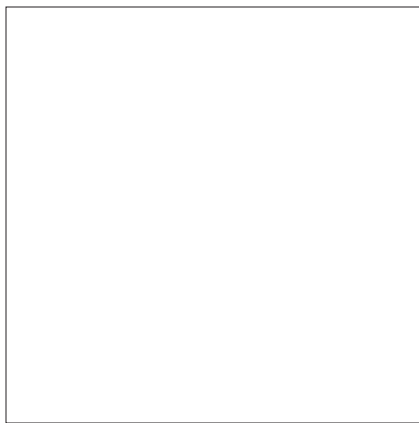
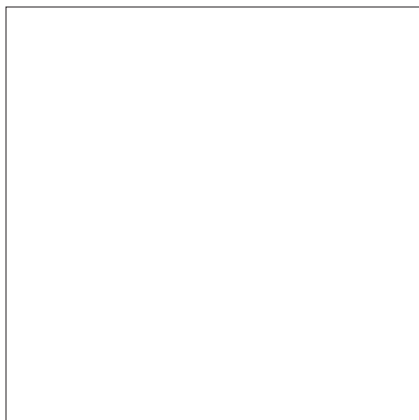
Pleurothallis cardiothallis



Pleurothallis chontalensis



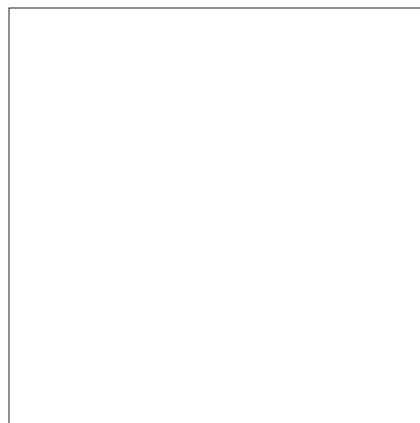
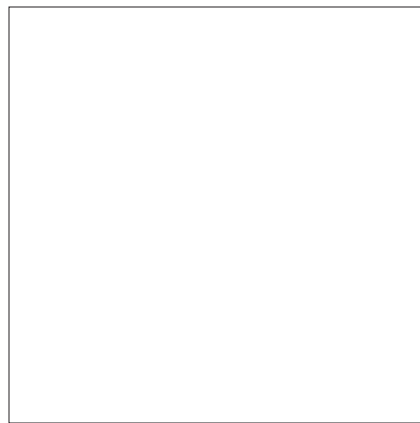
Pleurothallis corniculata



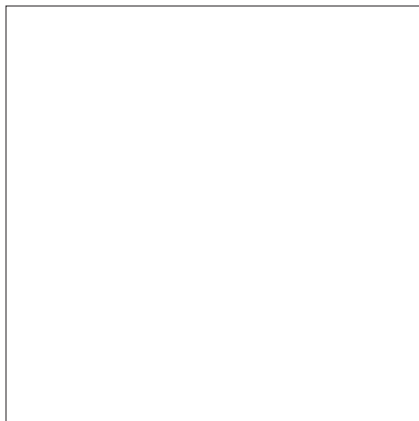
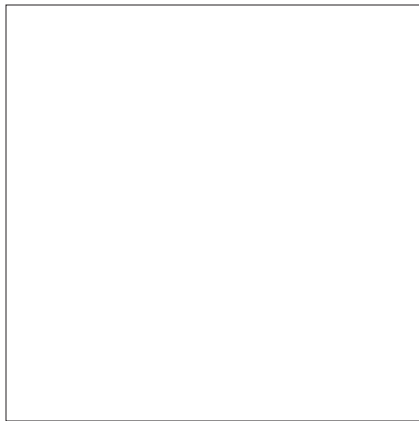
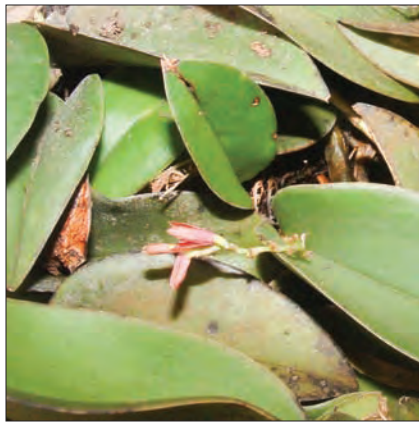
Pleurothallis dolichopus



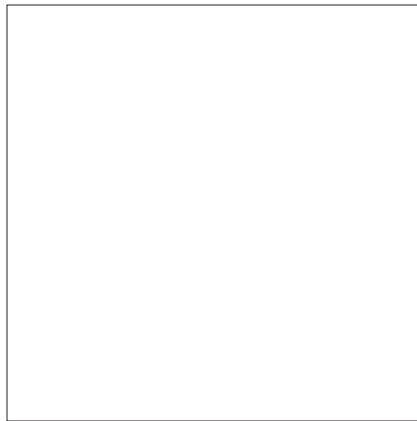
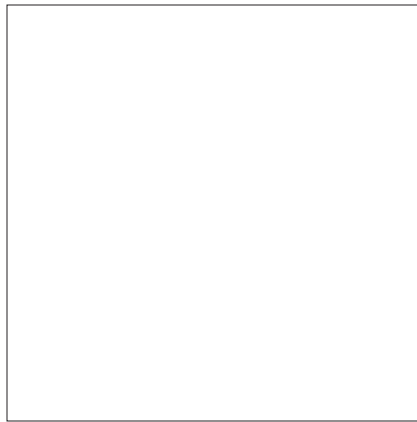
Pleurothallis endotrachys



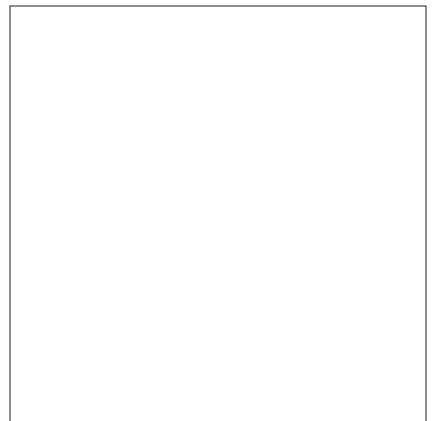
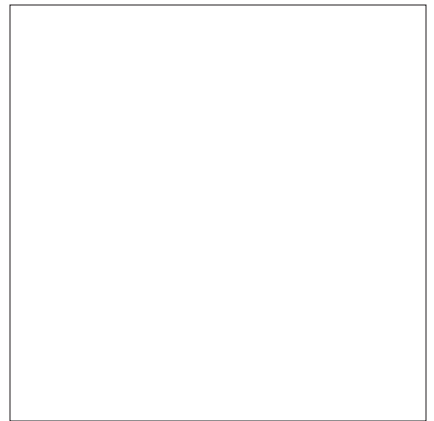
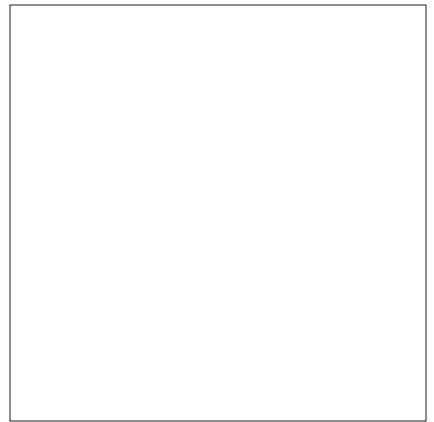
Pleurothallis erinacea



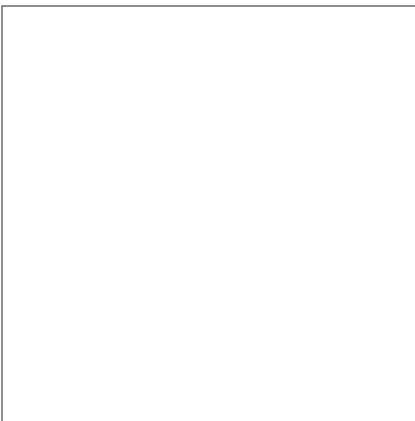
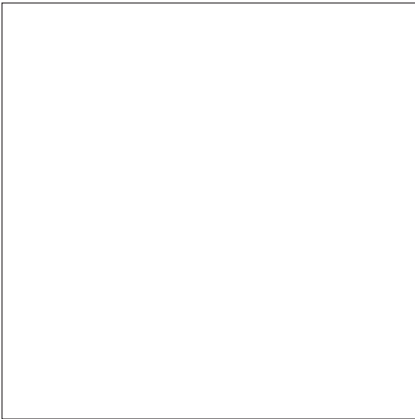
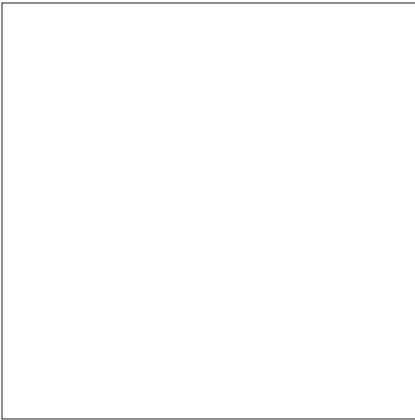
Pleurothallis fuegii



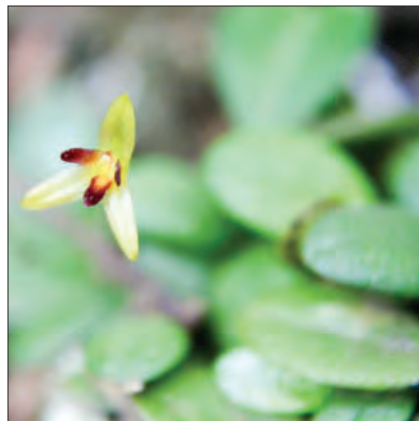
Pleurothallis fuegii var *echinata*



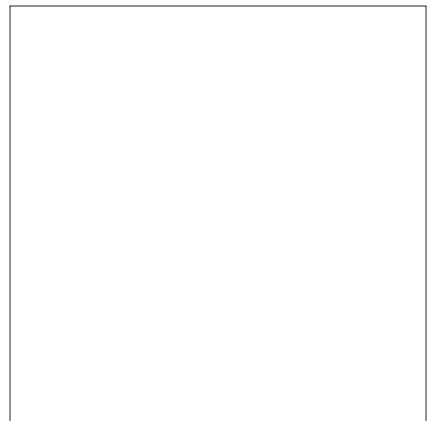
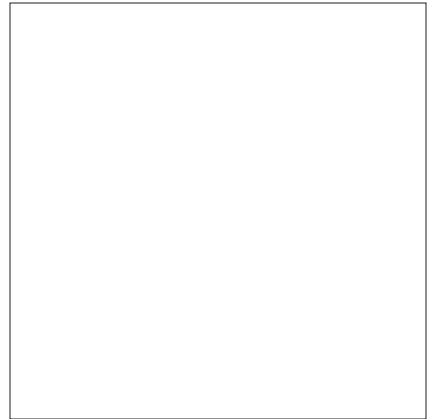
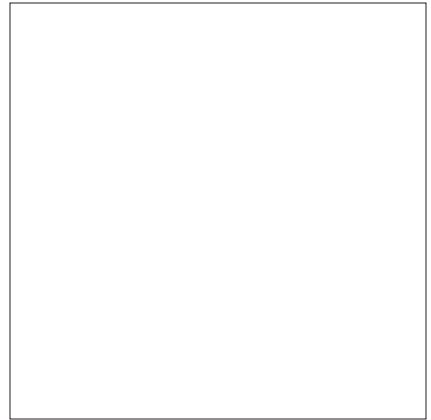
Pleurothallis helleri



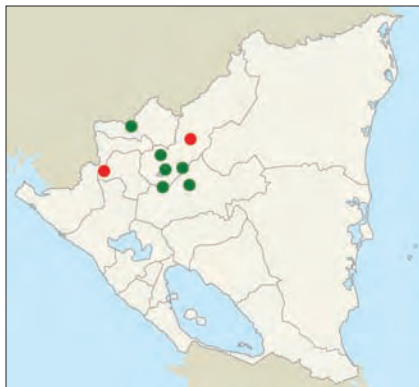
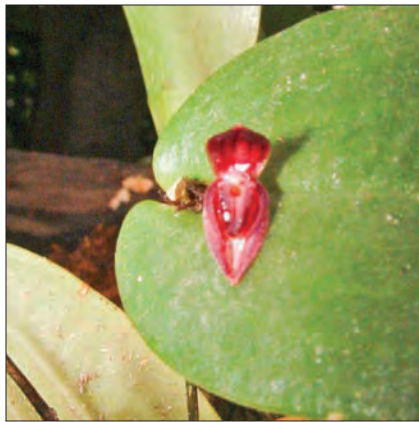
Pleurothallis lewisae



Pleurothallis luctuosa



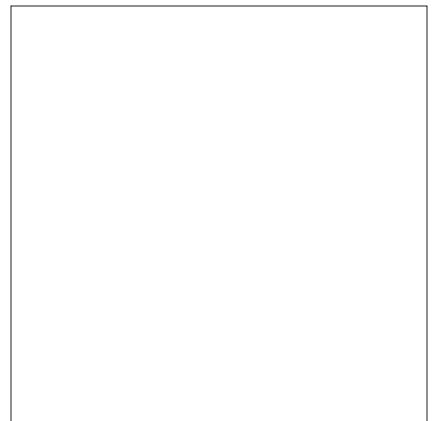
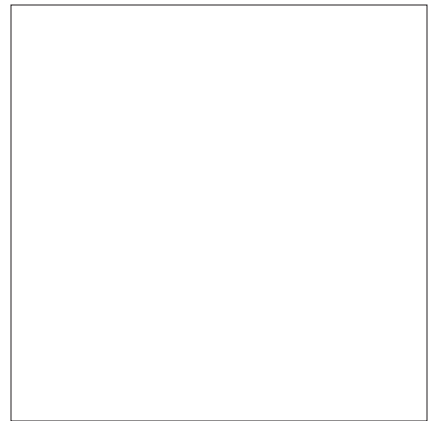
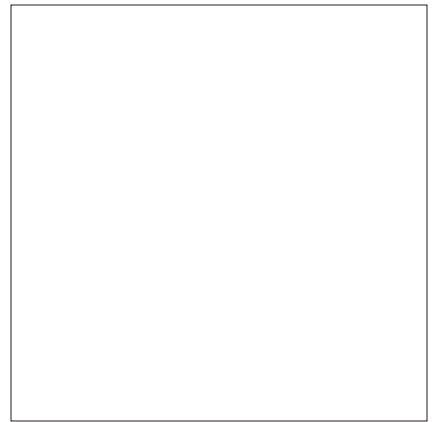
Pleurothallis matudiana



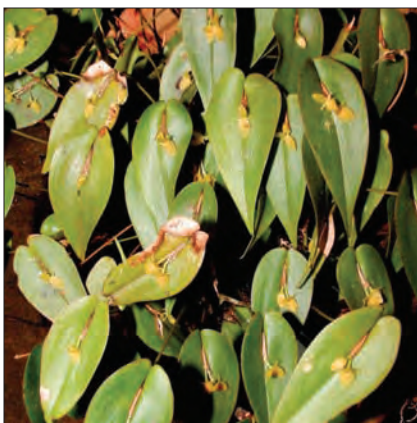
Pleurothallis nemorum



Pleurothallis obovata



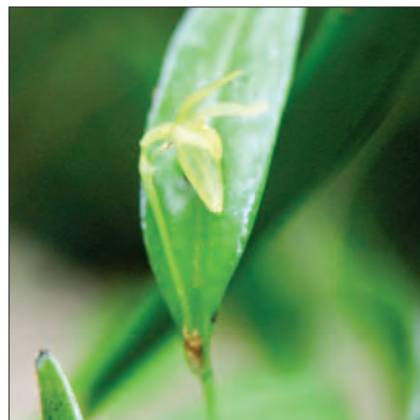
Pleurothallis phyllocardioides



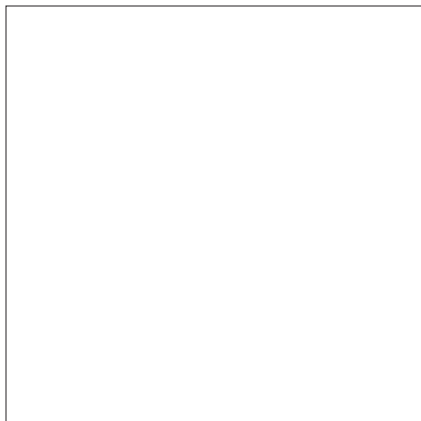
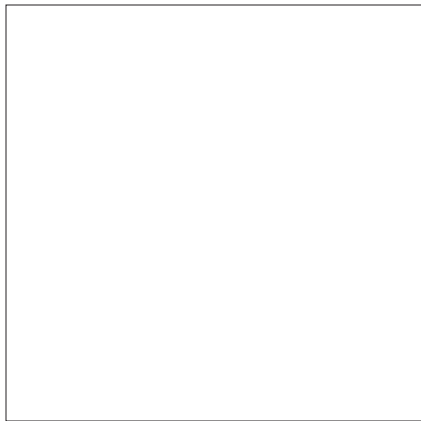
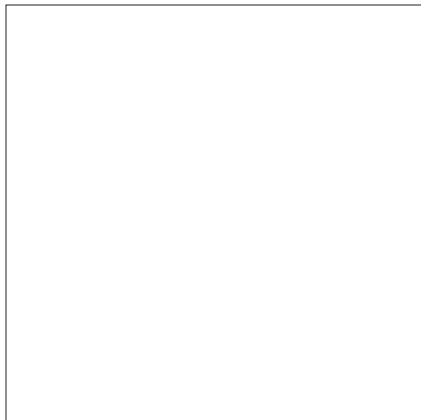
Pleurothallis platystylis



Pleurothallis pruinosa



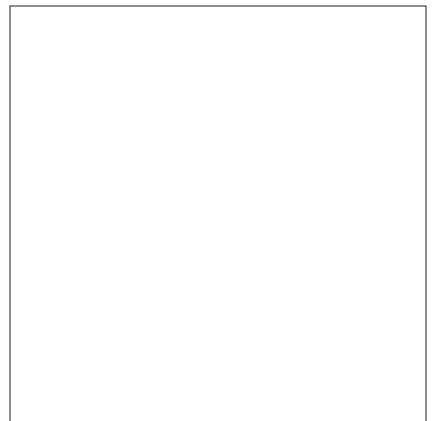
Pleurothallis pubescens



Pleurothallis racemiflora



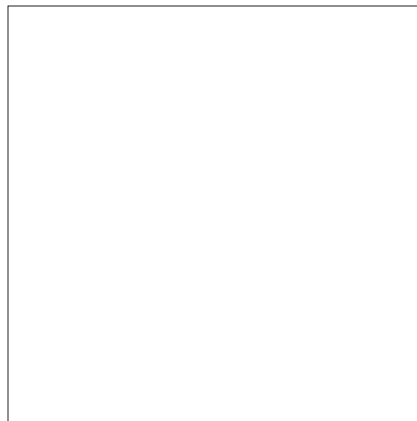
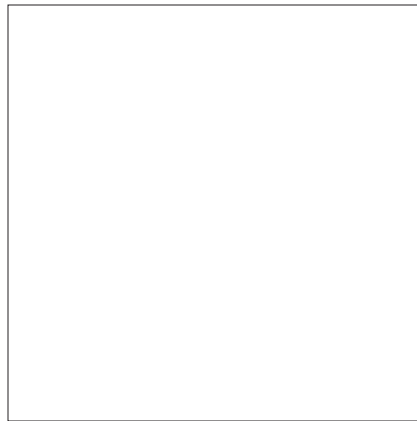
Pleurothallis segregatifolia



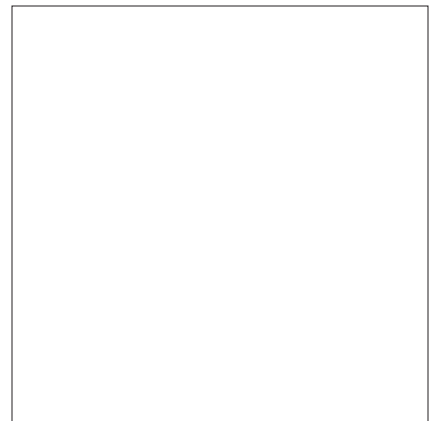
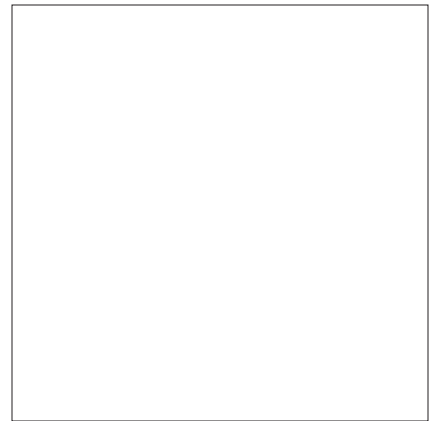
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Pleurothallis simmleriana



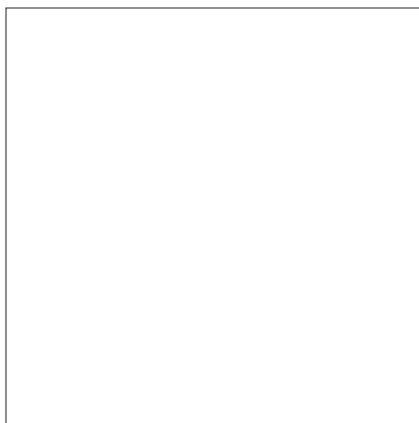
Pleurothallis testaeifolia



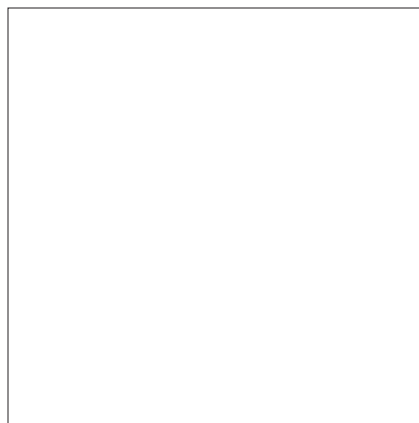
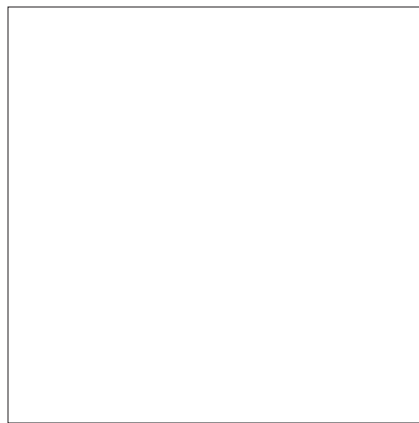
Pleurothallopsis ujarensis



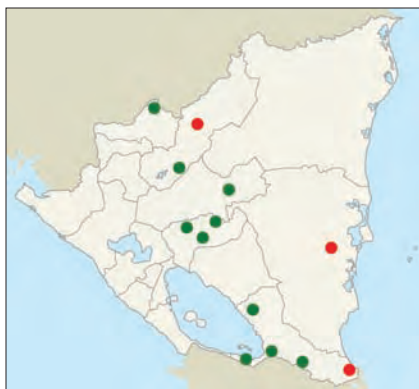
Polystachya clavata



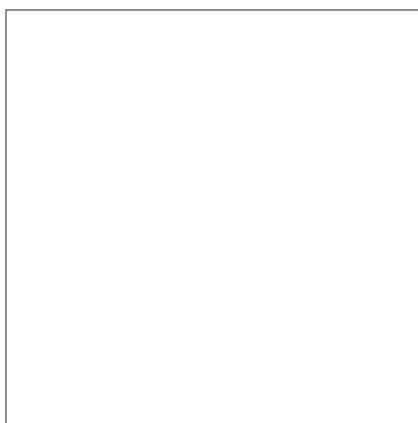
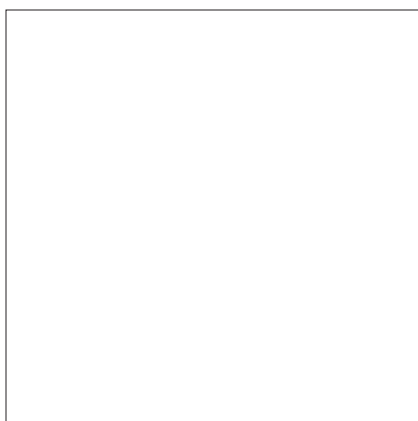
Polystachya concreta



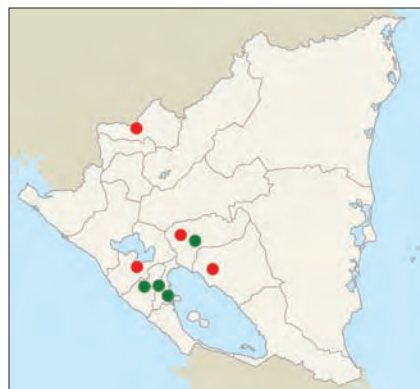
Polystachya foliosa



Polystachya lineata



Polystachya masayensis



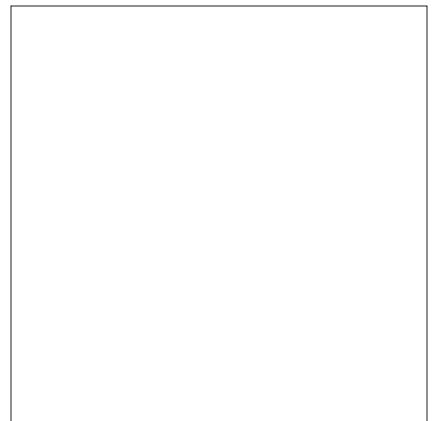
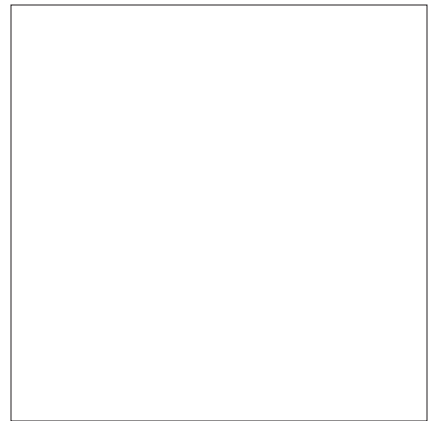
Ponera striata



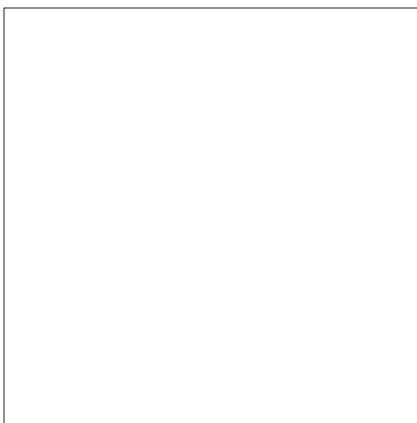
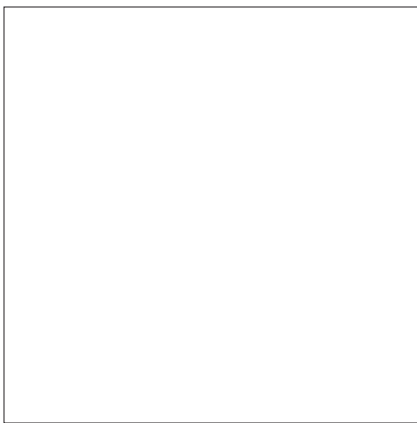
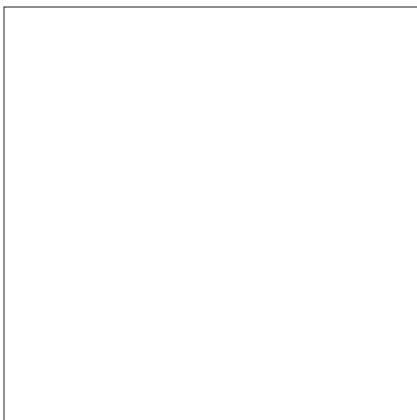
Ponera subquadrilabia



Pontheiva brenesii



Pontheiva ephippium



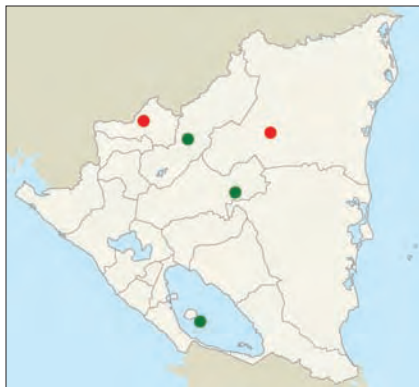
Ponthieva racemosa



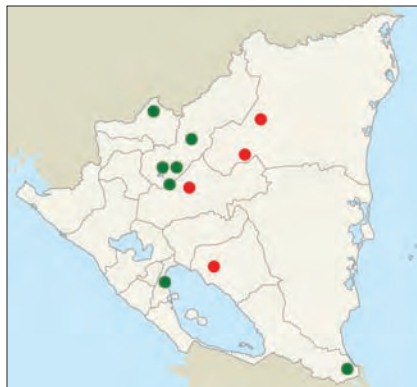
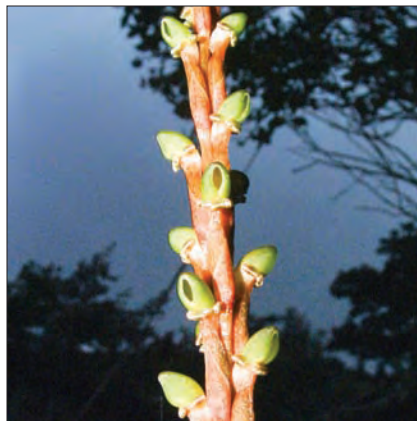
Ponthieva tuerckheimii



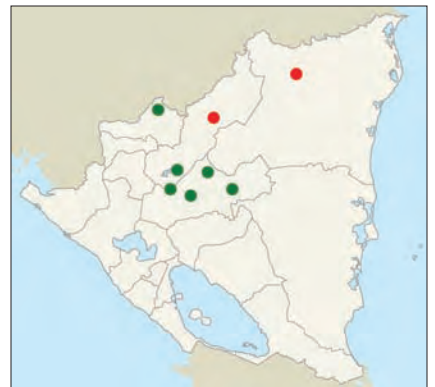
Prescottia oligantha



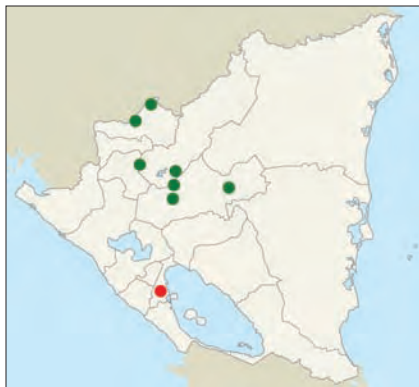
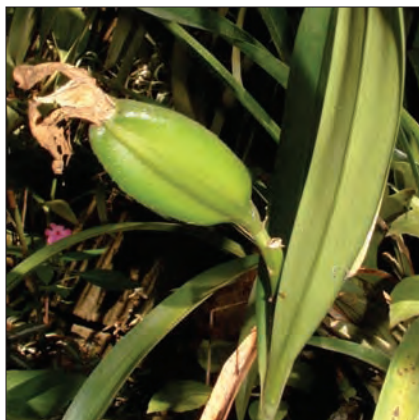
Prescottia stackyodes



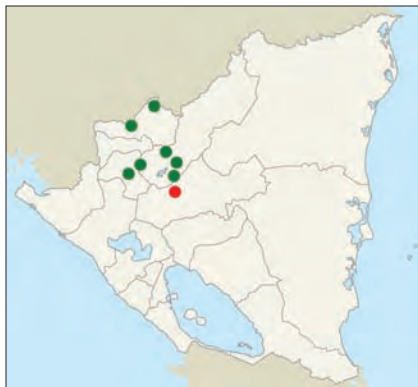
Prosthechea abbreviata



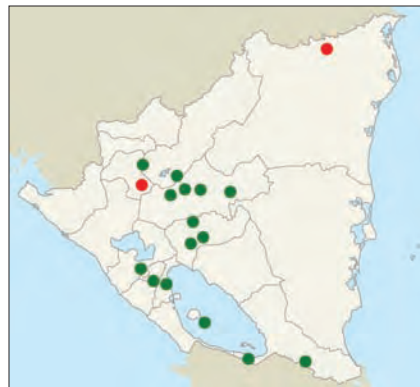
Prosthechea baculus



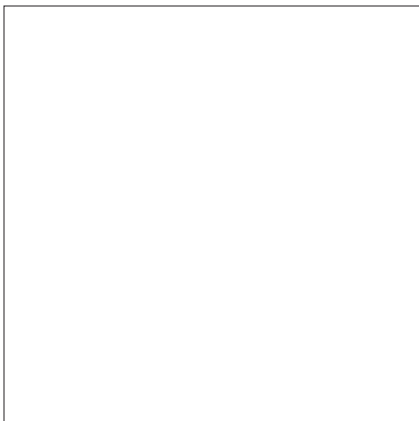
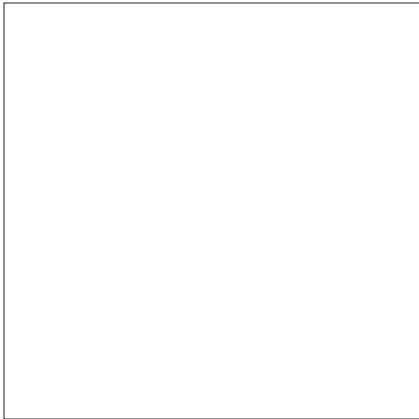
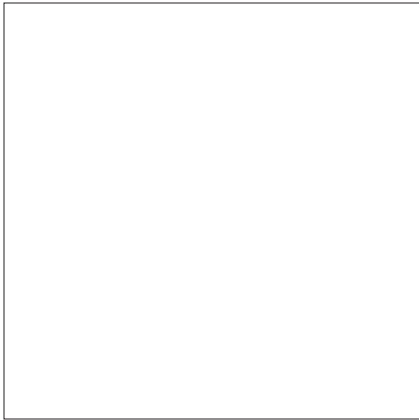
Prosthechea brassavolae



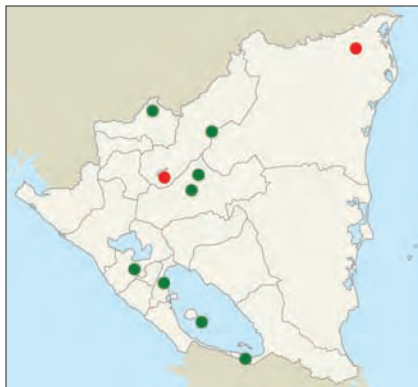
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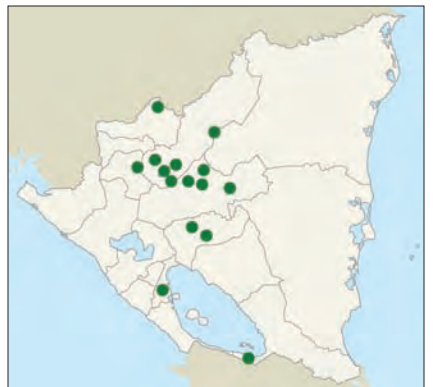
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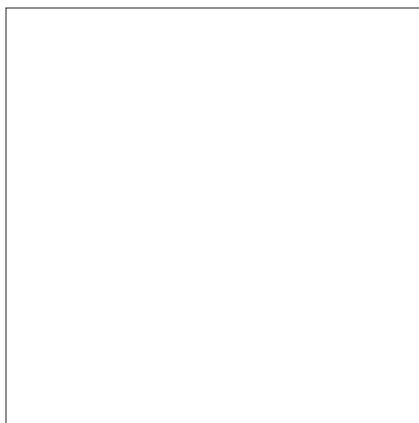
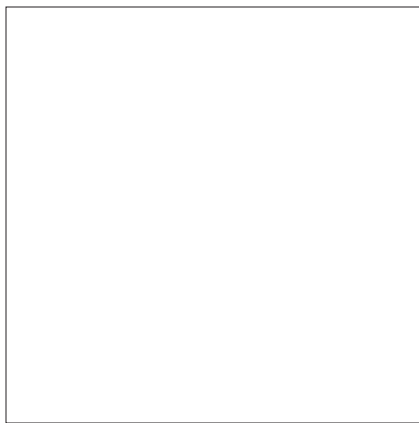
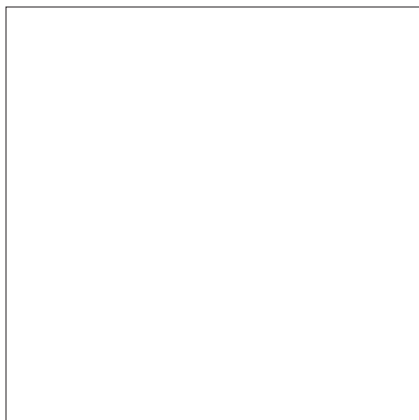
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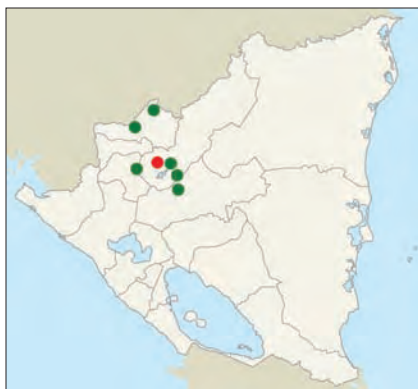
Prosthechea fragrans



Prosthechea livida



Prosthechea ochracea



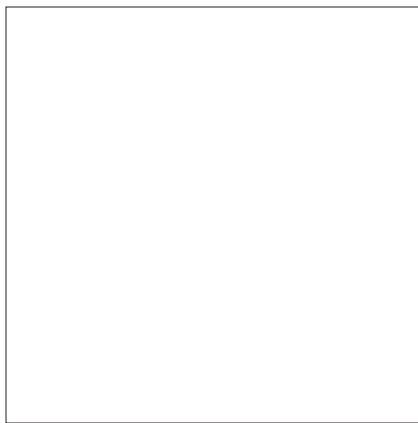
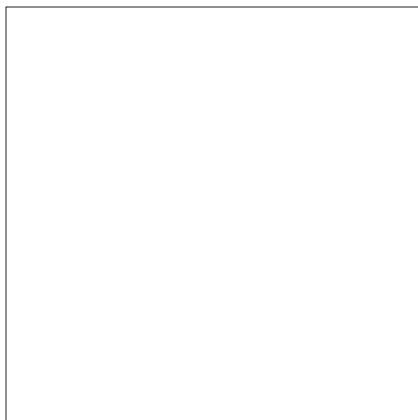
Prosthechea pygmaea



Prosthechea radiata



Prosthechea rhynchophora



Prosthechea valenzuelana



Psilochilus macrophyllus



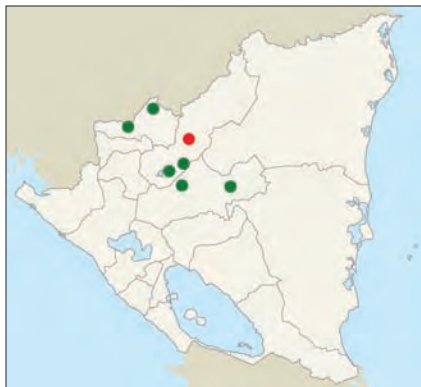
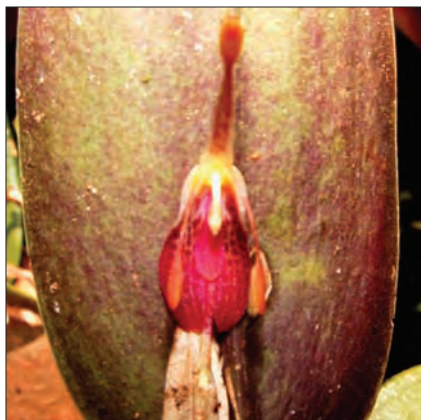
Psilochilus modestus



Psychopsis krameriana



Restrepia muscifera



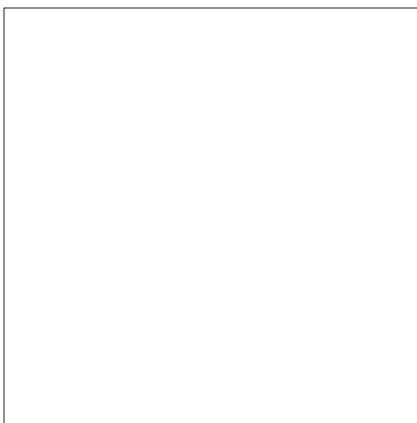
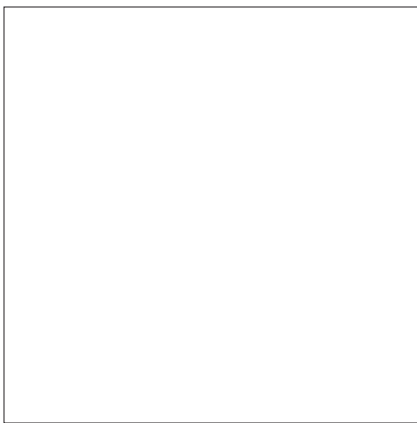
Restrepiella ophiocephala



Rhyncholaelia digbyana



Rhyncholaelia glauca



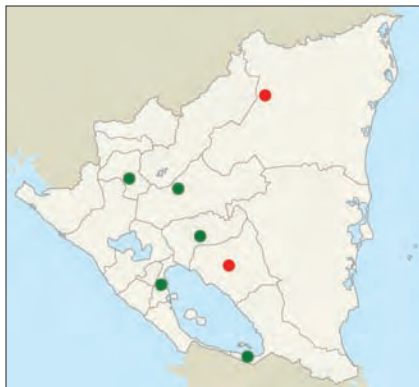
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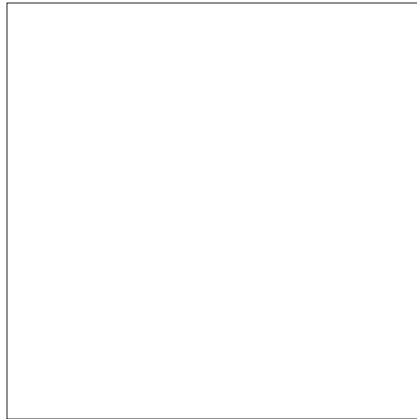
Rodriguezia compacta



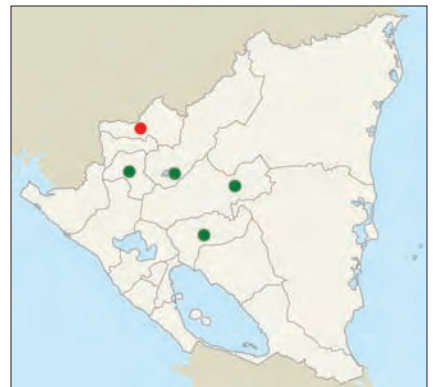
Sarcoglottis acaulis



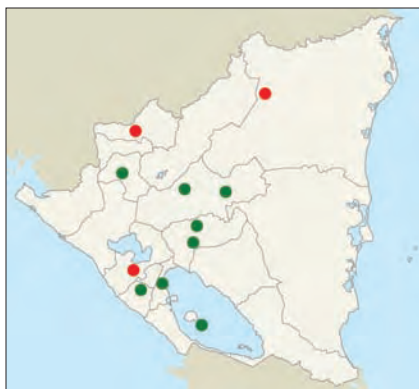
Sarcoglottis hunteriana



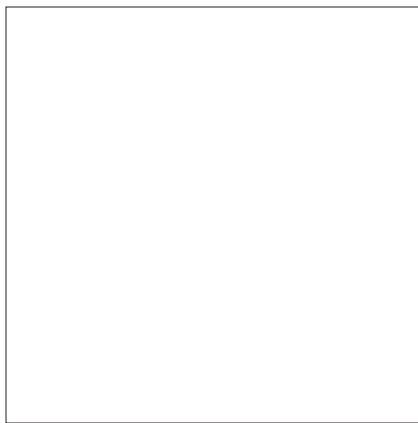
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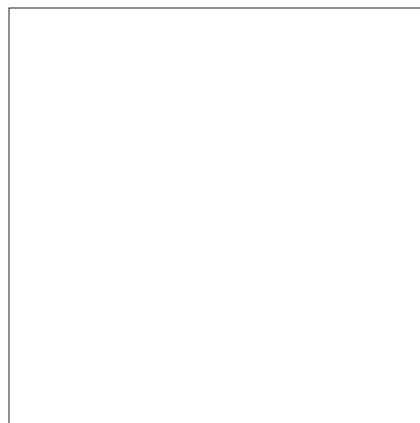
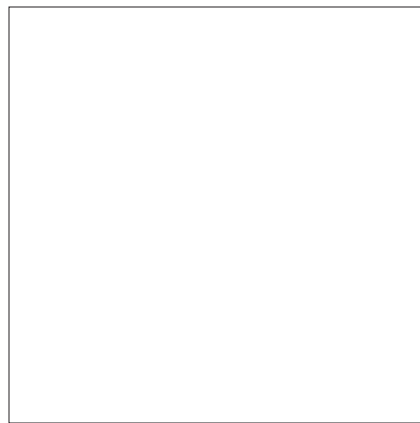
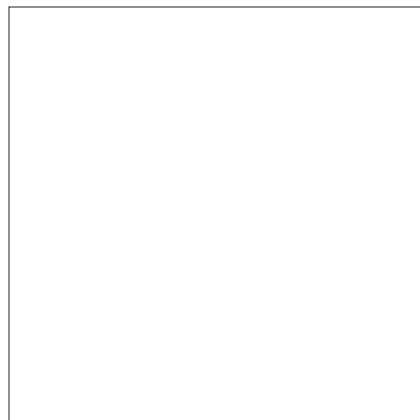
Sarcoglottis sceptrodes



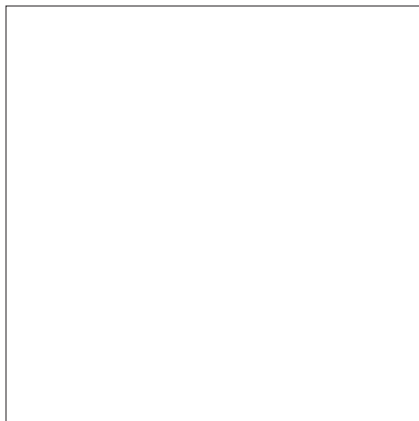
Sarcoglottis schaffneri



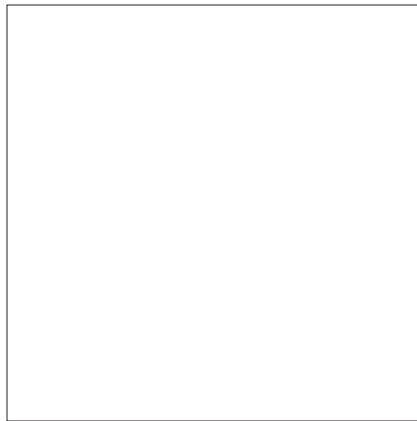
Sarcoglottis smithii



Scaphosepalus microdactylum



Scaphyglottis amparoana



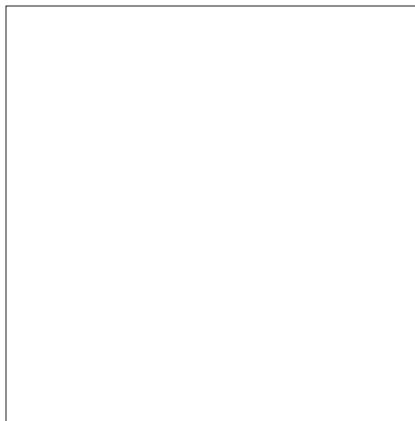
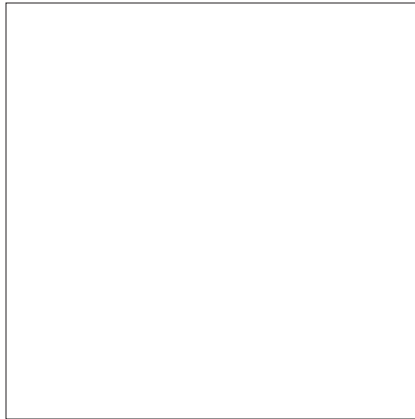
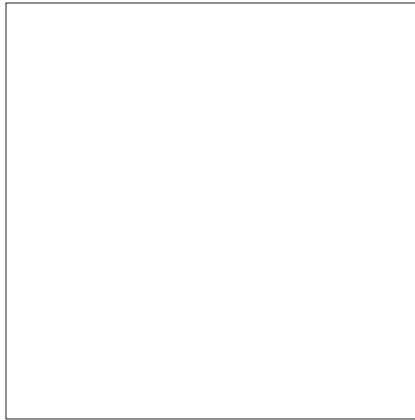
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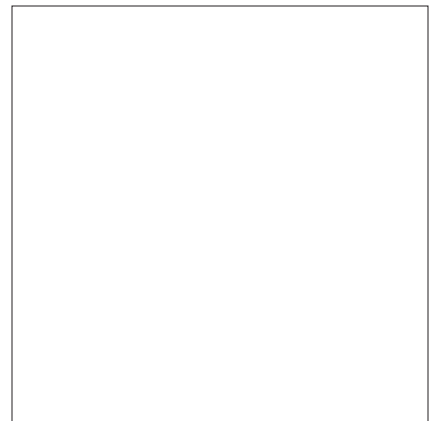
Scaphyglottis bidentata



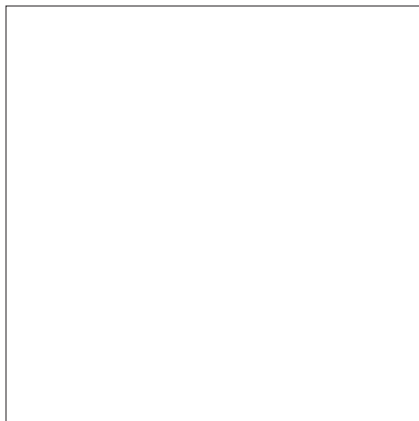
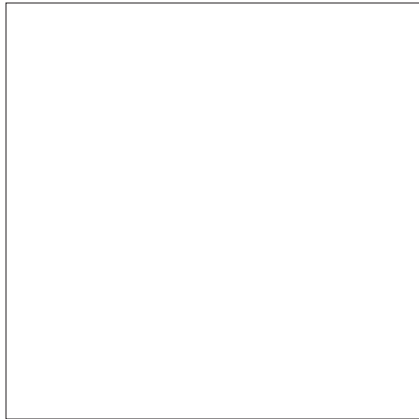
Scaphyglottis bilineata



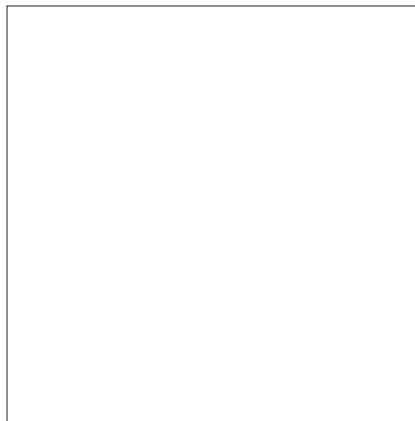
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Scaphyglottis confusa



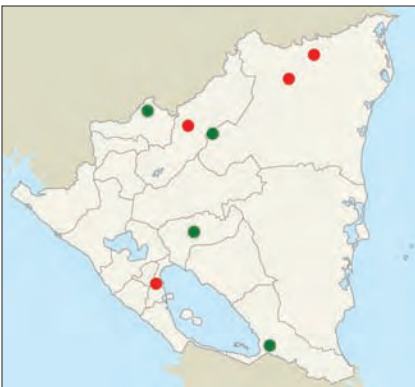
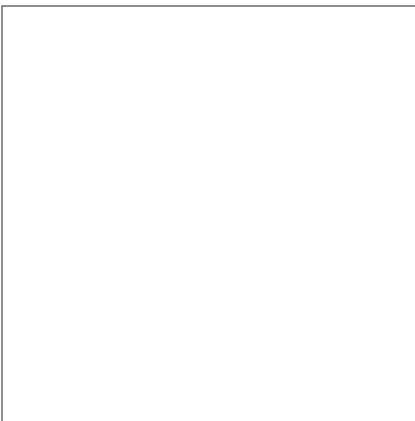
Scaphyglottis crurigera



Scaphyglottis fasciculata



Scaphyglottis graminifolia



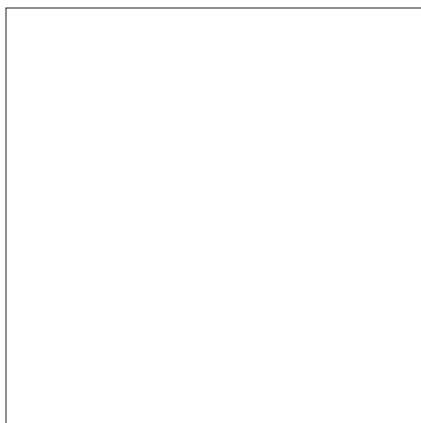
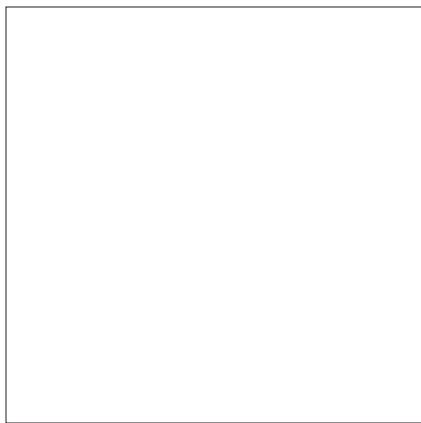
Scaphyglottis imbricada



Scaphyglottis laevilabia



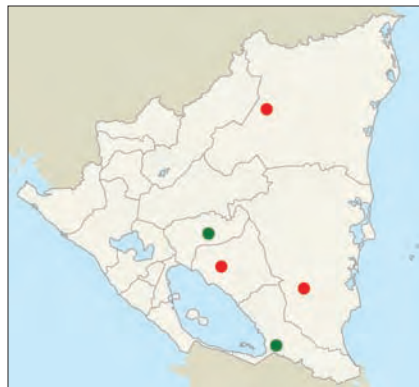
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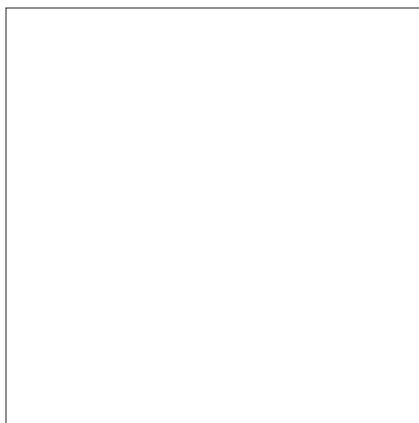
Scaphyglottis livida



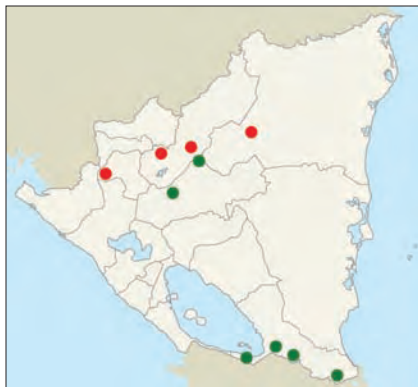
Scaphyglottis longicaulis



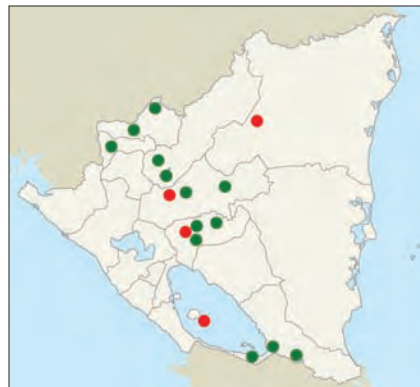
Scaphyglottis micrantha



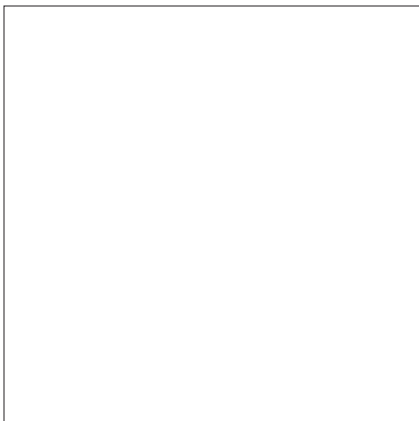
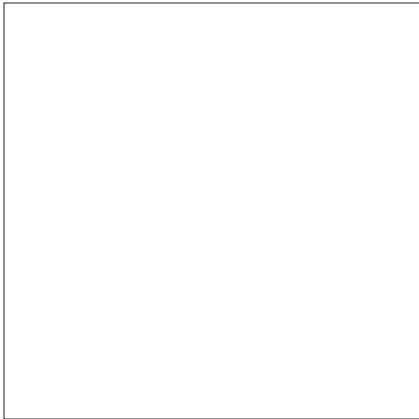
Scaphyglottis minutiflora



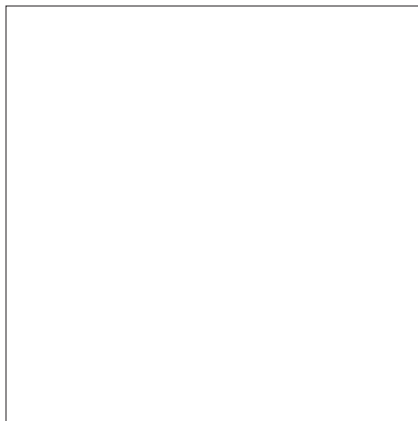
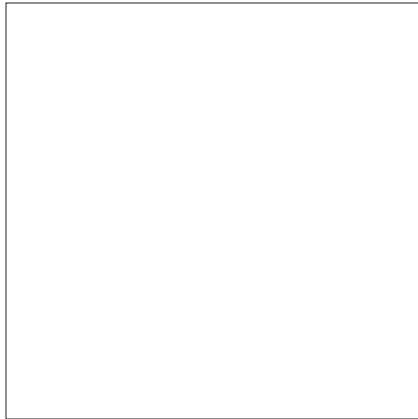
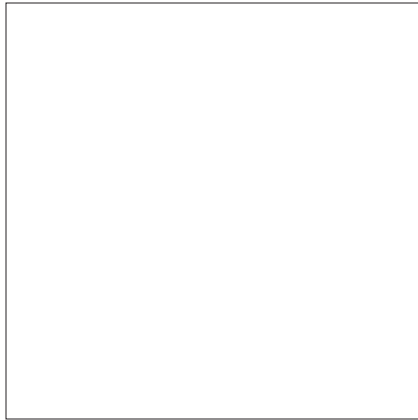
Scaphyglottis prolifera



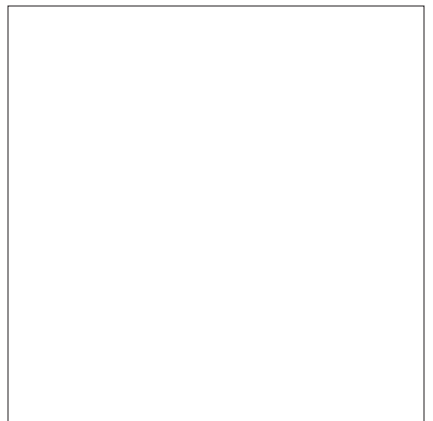
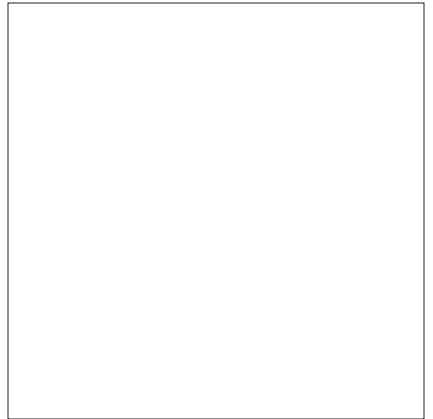
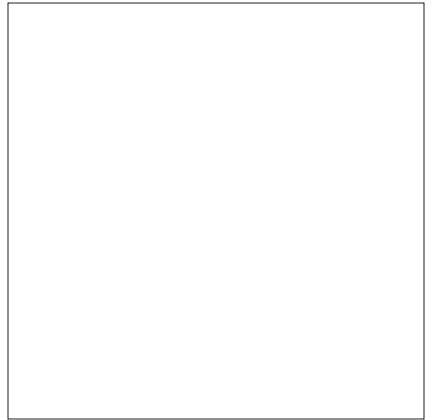
Scaphyglottis tenella



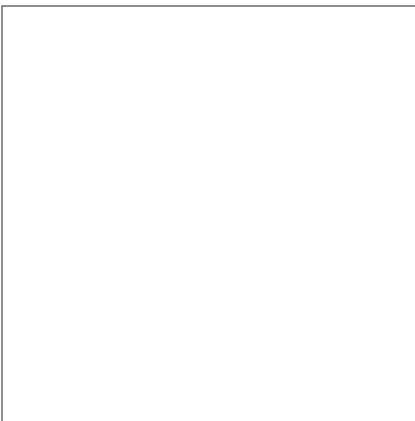
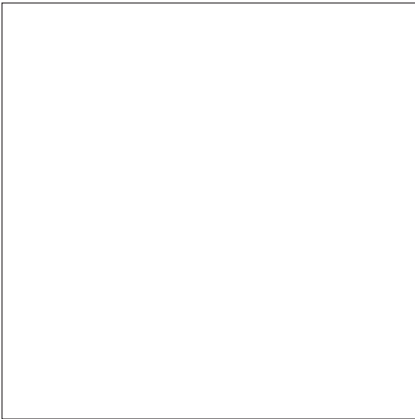
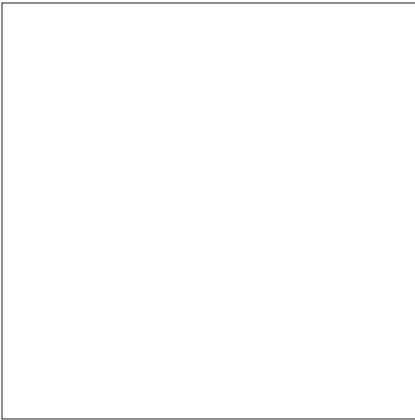
Scelochilus tuerckheimii



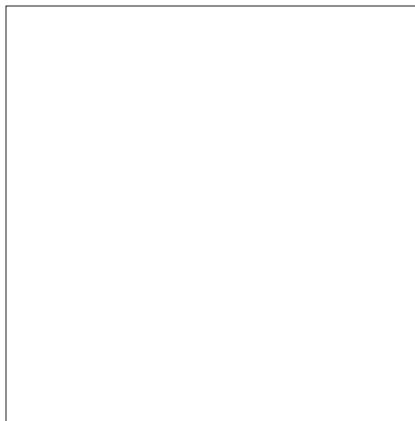
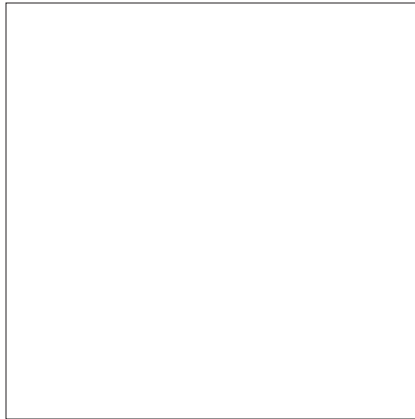
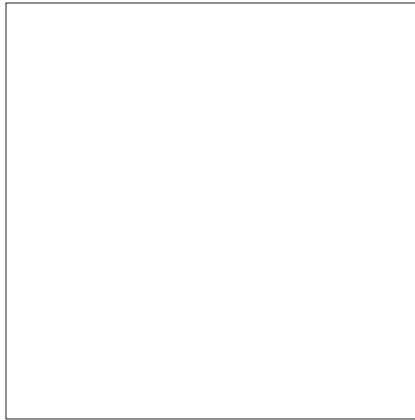
Schiedeella llaveana



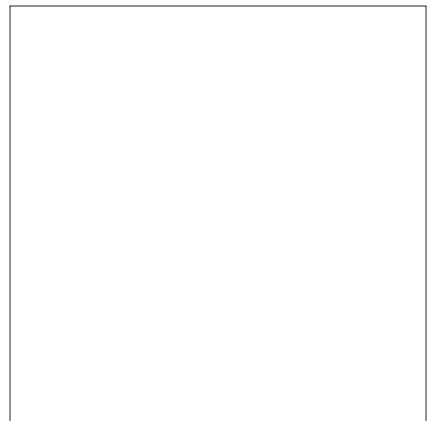
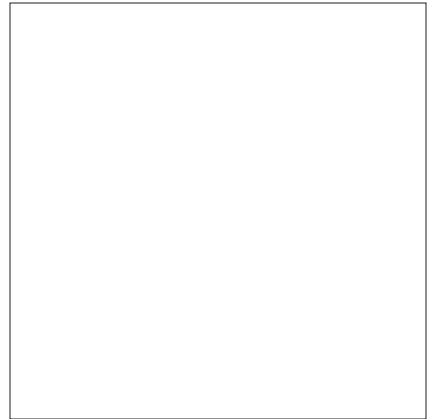
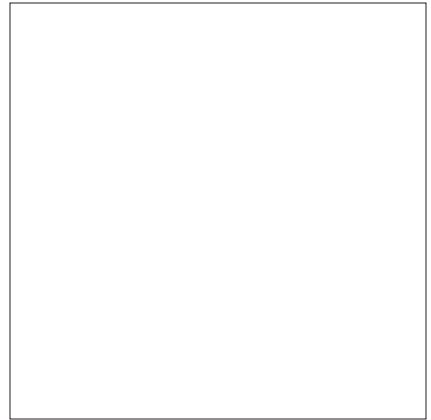
Schiedeella parasitica



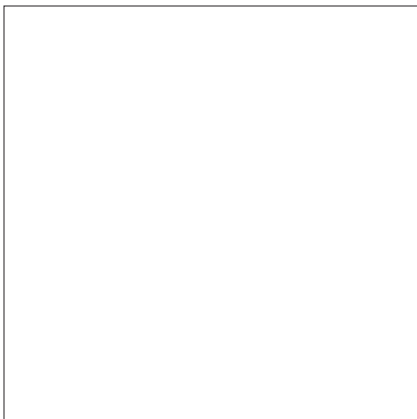
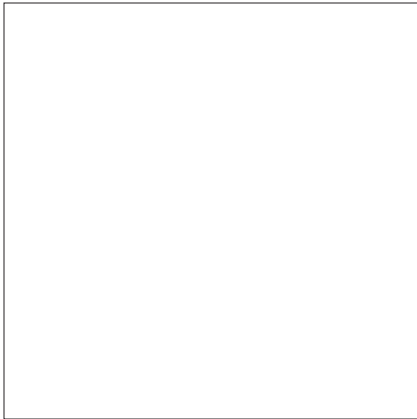
Schiedeella trilineata



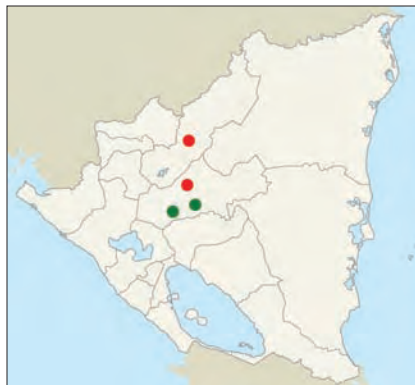
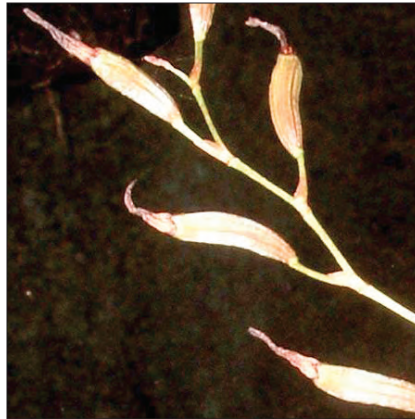
Schiedeella wercklei



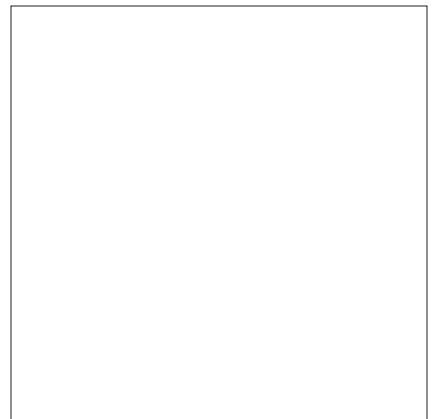
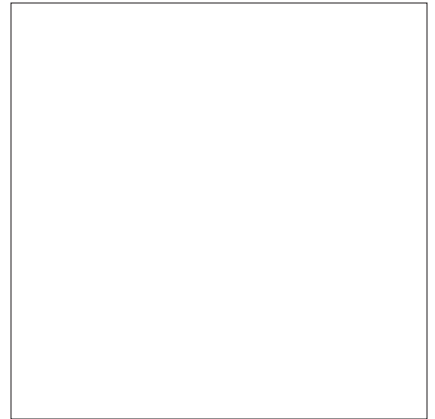
Sievekingia suavis



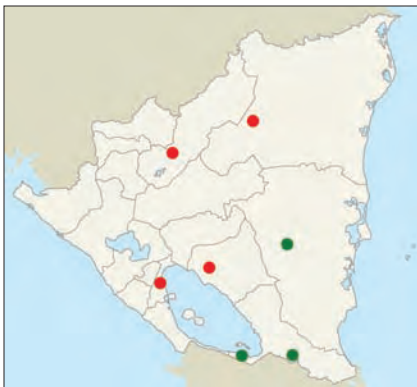
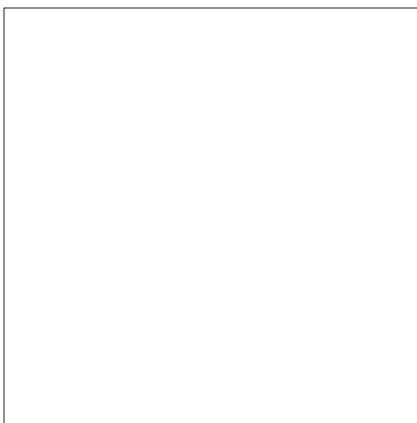
Sigmatostalix guatemalensis



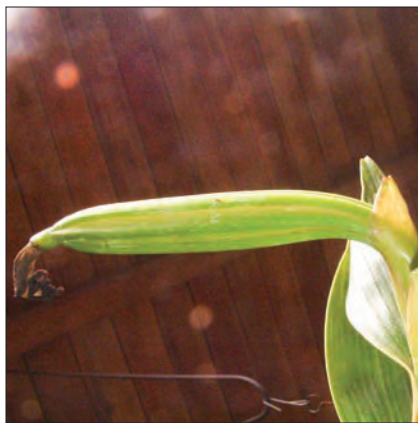
Sobralia atropubescens



Sobralia bletiae



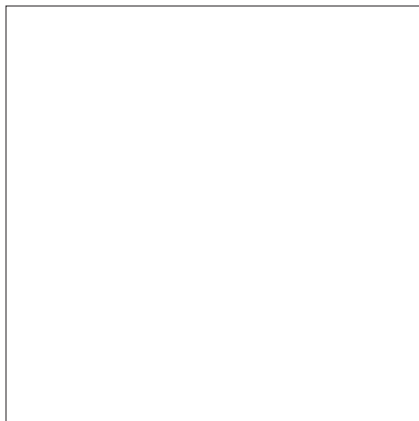
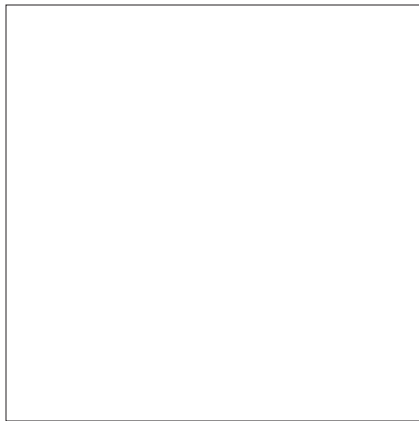
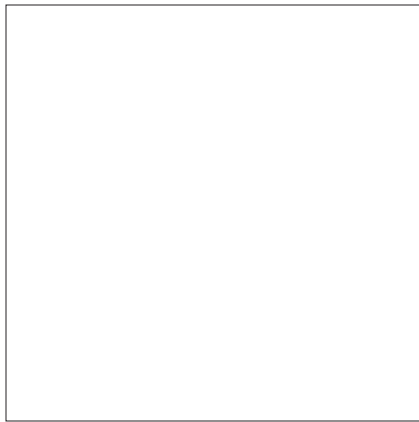
Sobralia bouchei



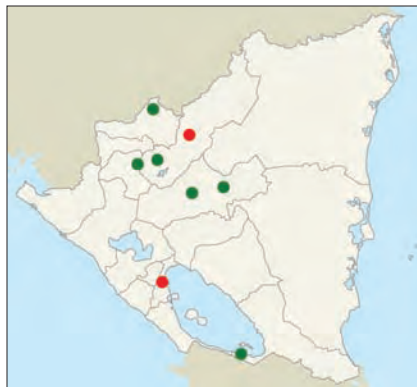
Sobralia bradeorum



Sobralia chatoensis



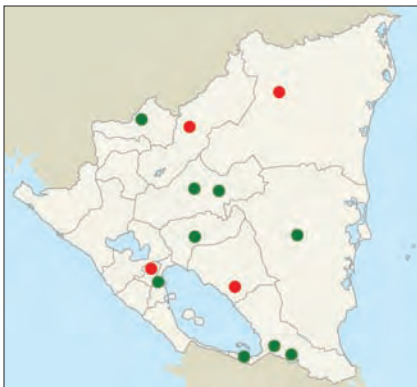
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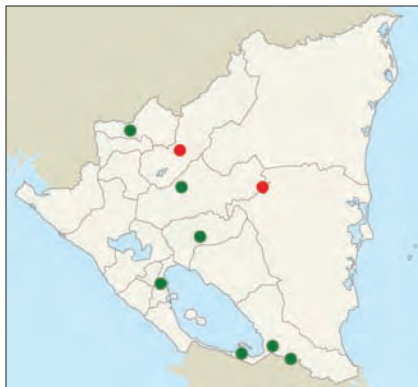
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Sobralia decora



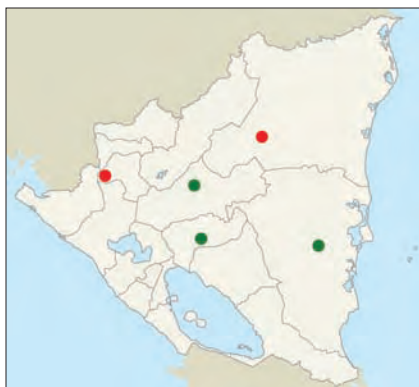
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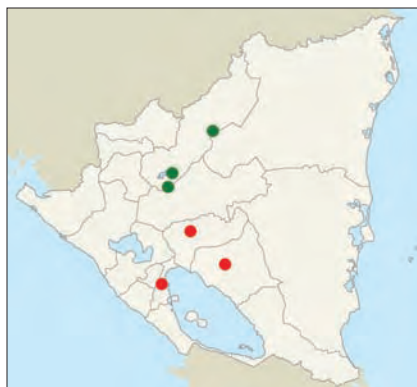
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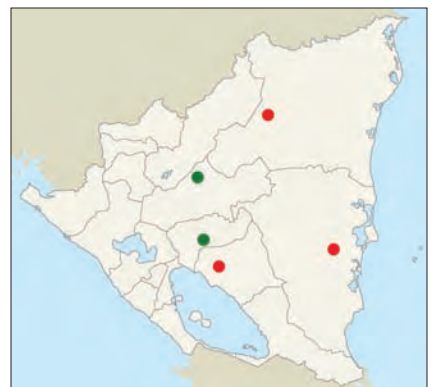
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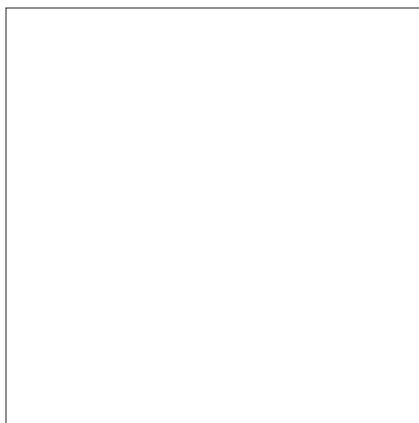
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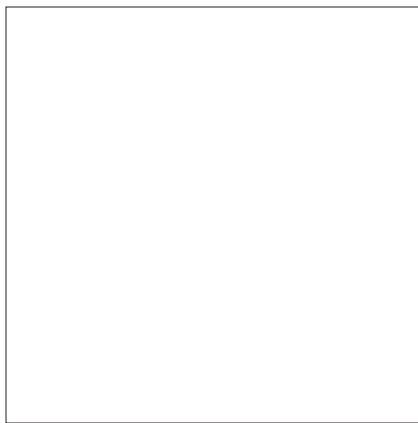
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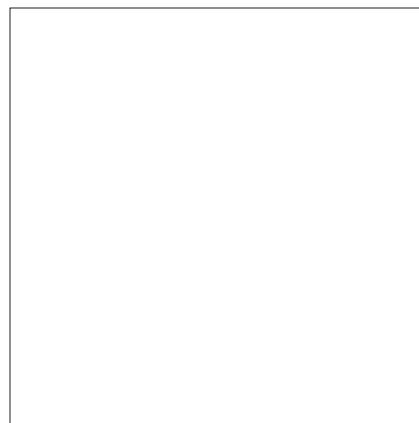
Sobralia sp



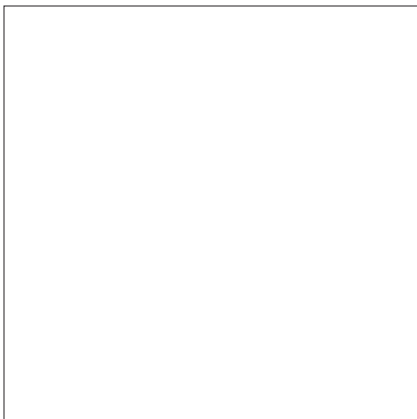
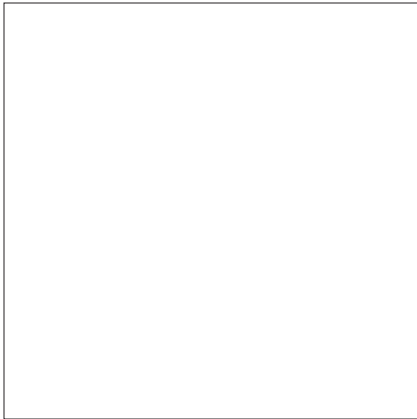
Sobralia warscewiczii



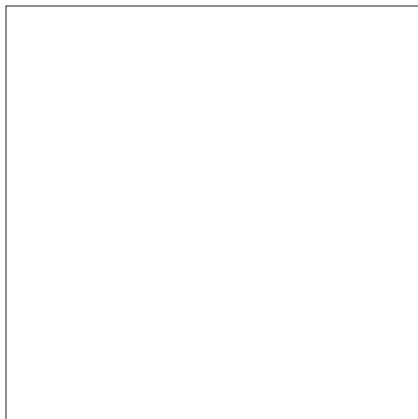
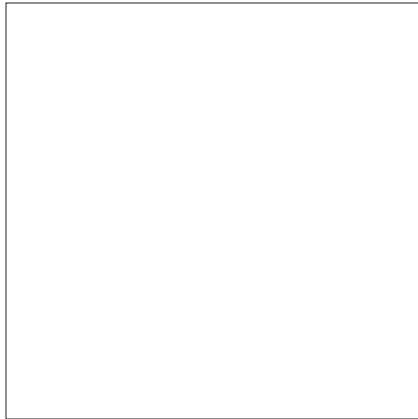
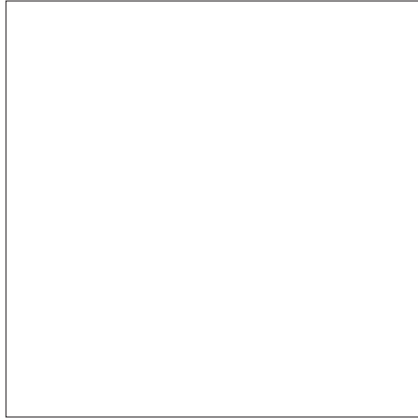
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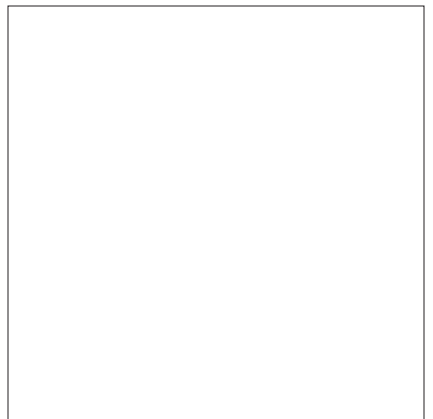
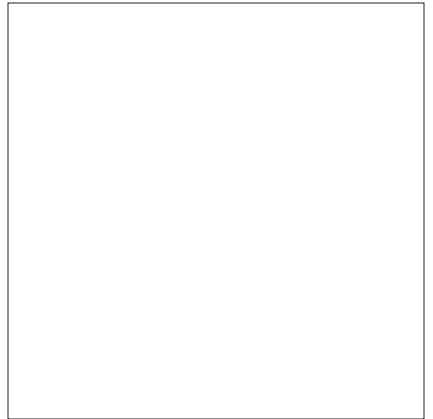
Specklinia brighami



Specklinia exesilabia



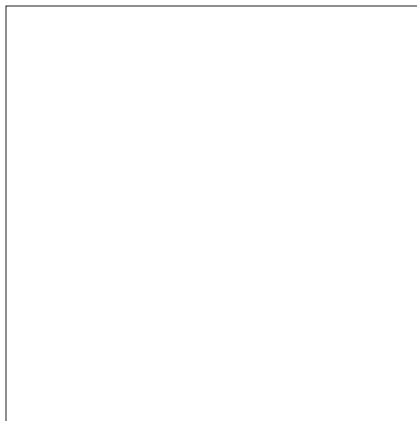
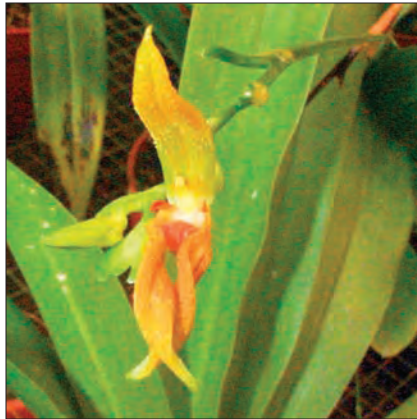
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Specklinia glandulosa



Specklinia grobyi



Specklinia guanacastensis



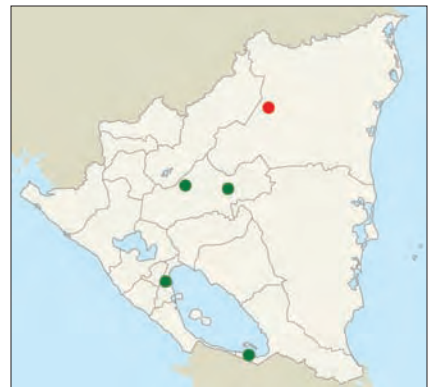
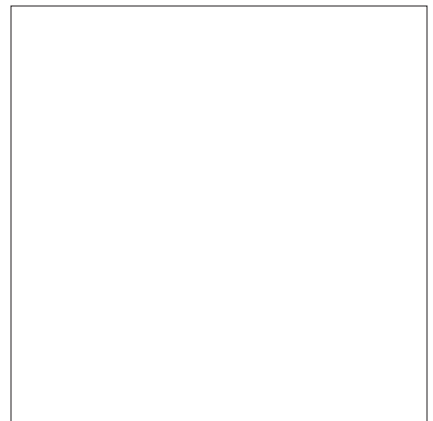
Specklinia hastata



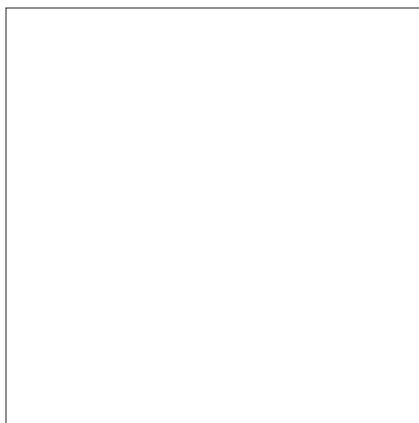
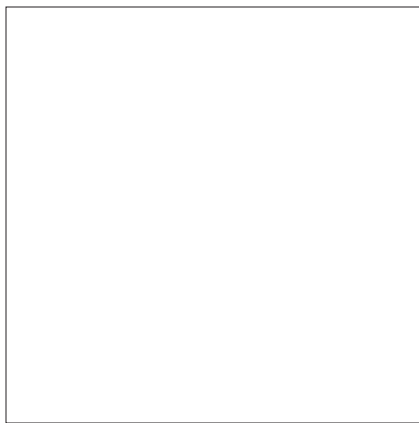
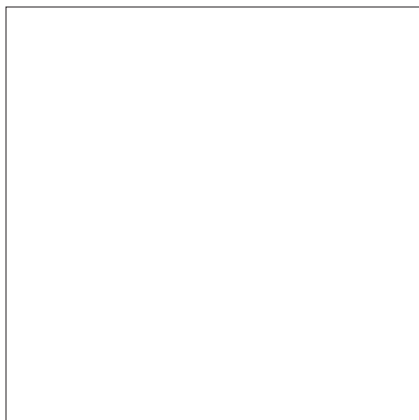
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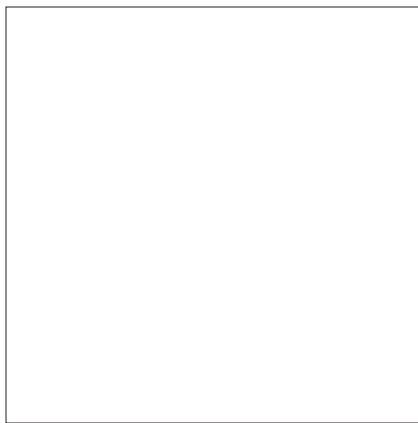
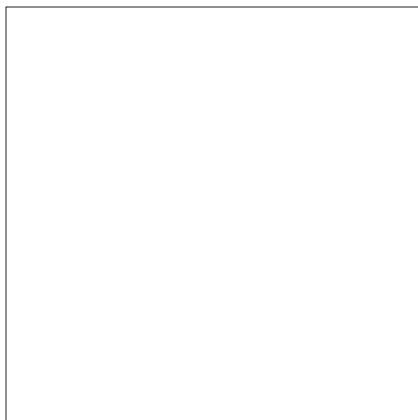
Specklinia tribuloides



Specklinia yucataensis



Spiranthes graminea



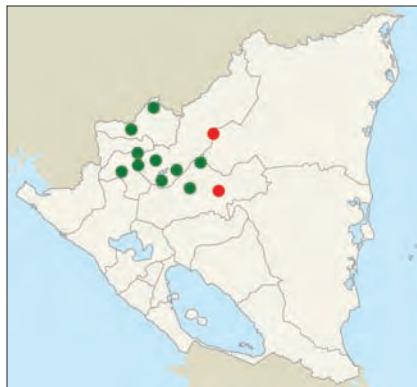
Spiranthes polyantha



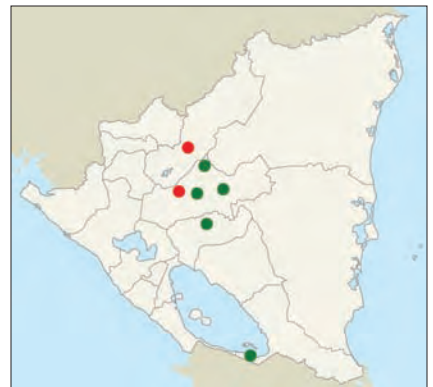
Stanhopea cirrhata



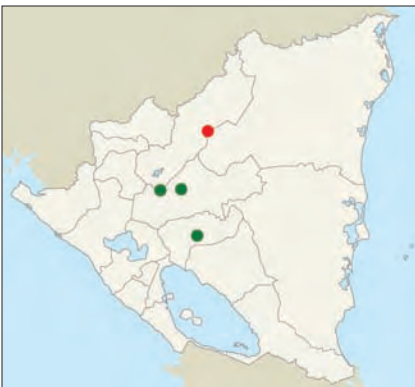
Stanhopea costaricensis



Stanhopea ecornuta



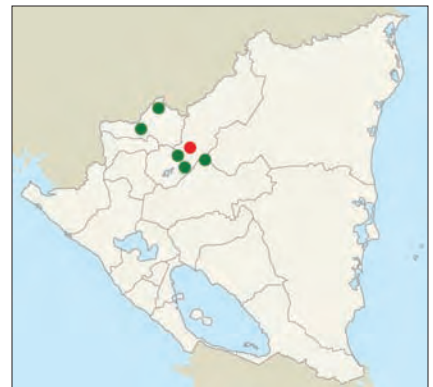
Stanhopea gibbosa



Stanhopea graveolens



Stanhopea confusa



Stanhopea oculata



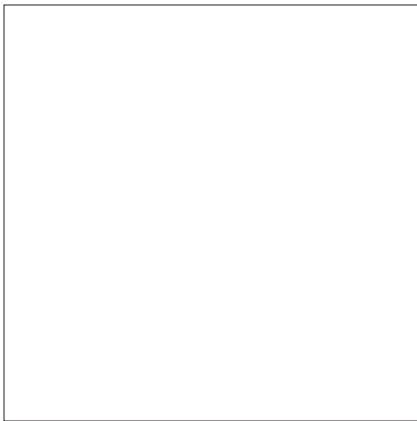
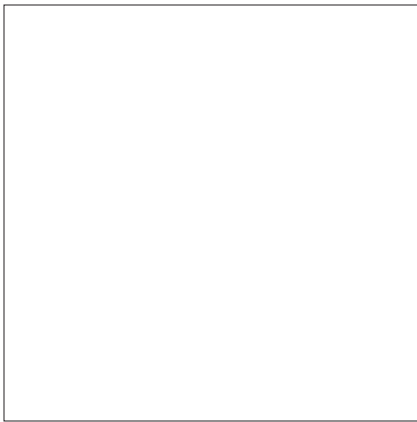
Stanhopea ruckeri



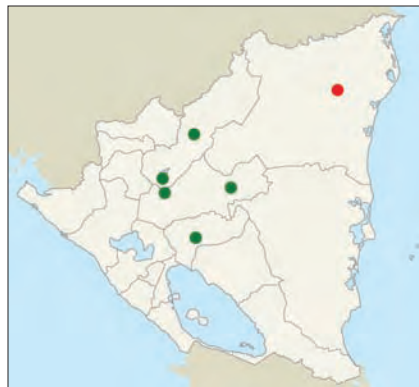
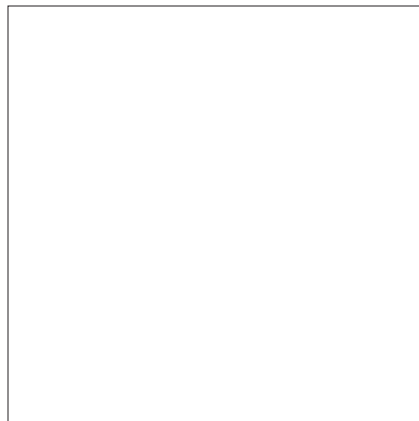
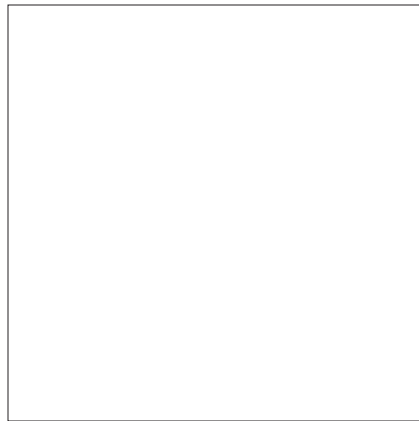
Stanhopea wardii



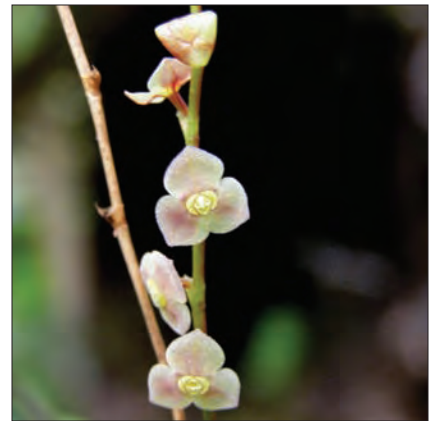
Stelis aemula



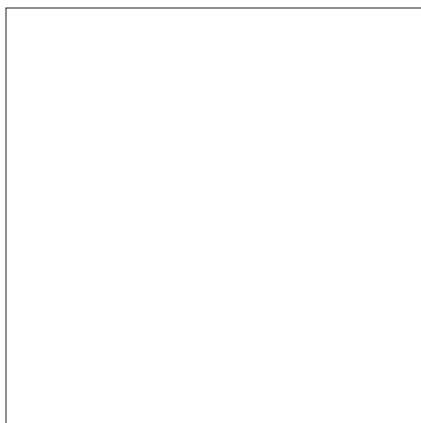
Stelis aprica



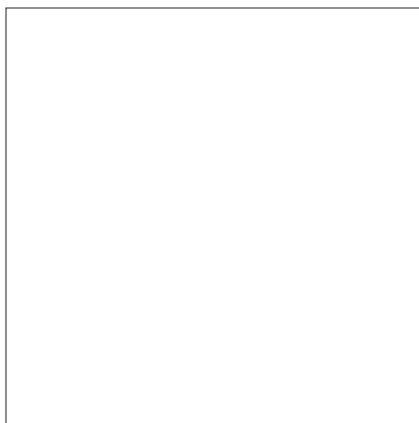
Stelis argentata



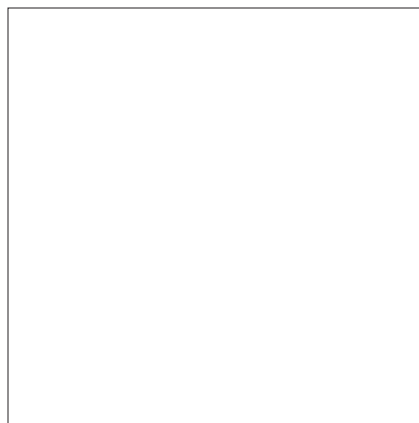
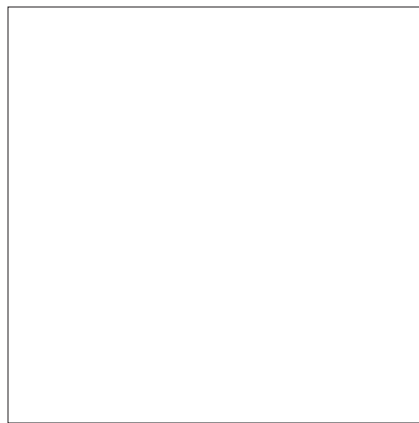
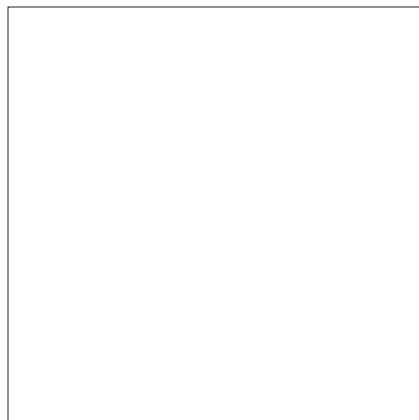
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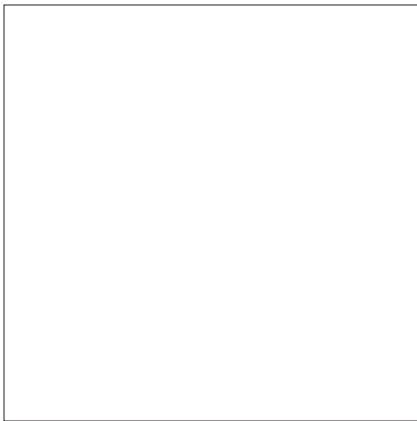
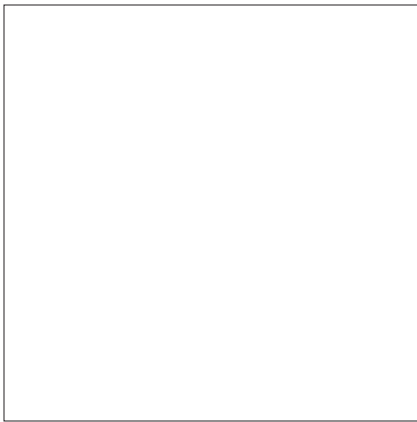
Stelis chihobensis



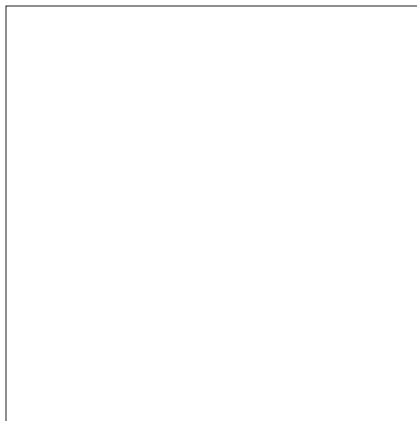
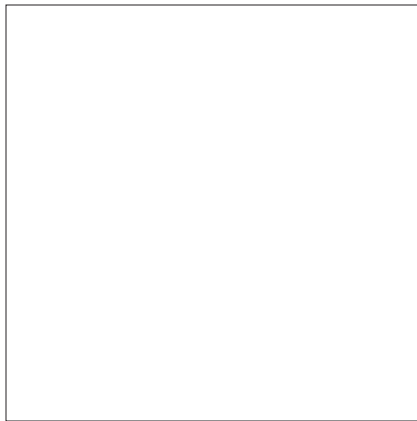
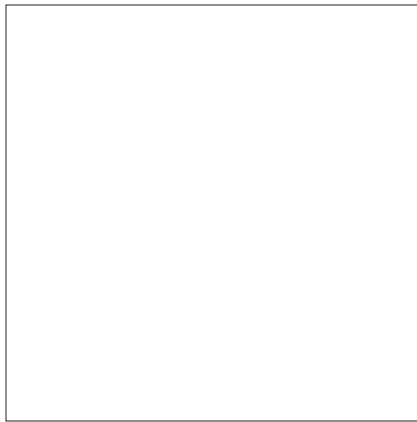
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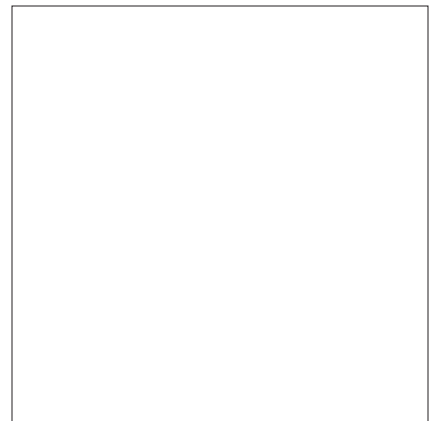
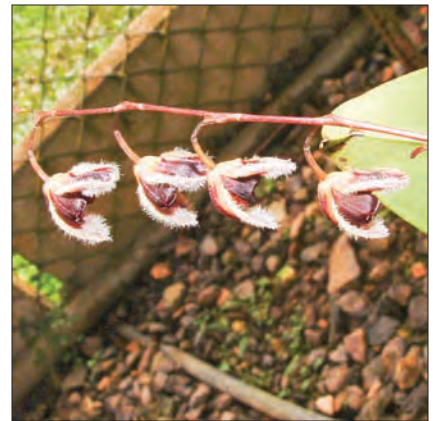
Stelis cobanensis



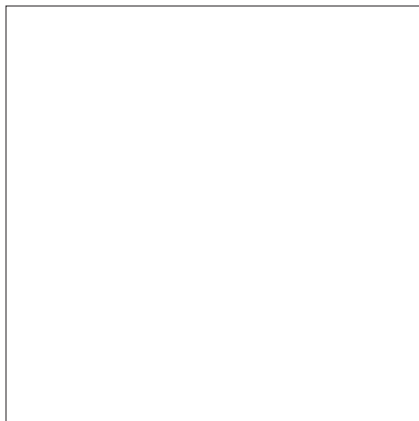
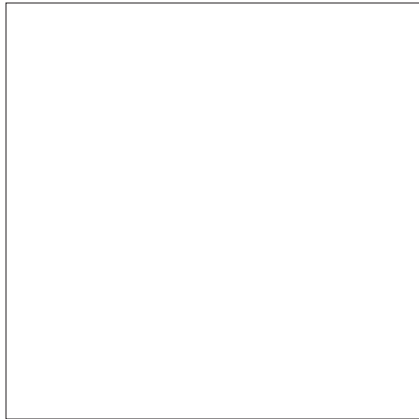
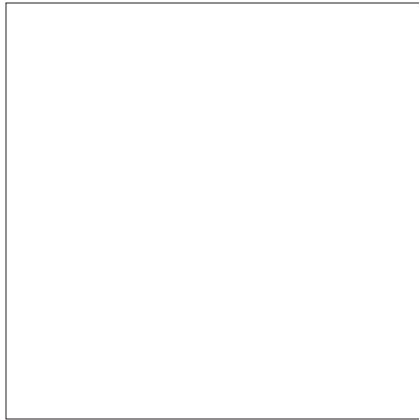
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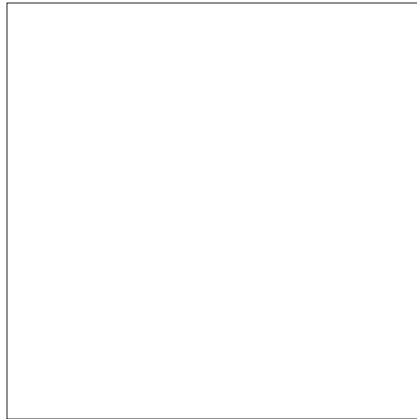
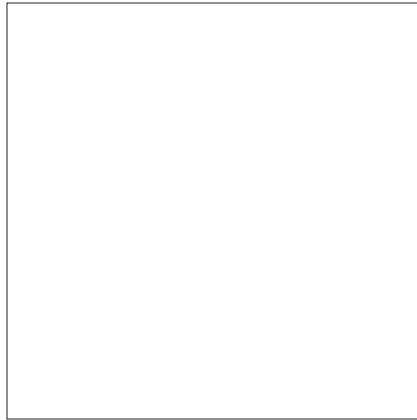
Stelis convallaria



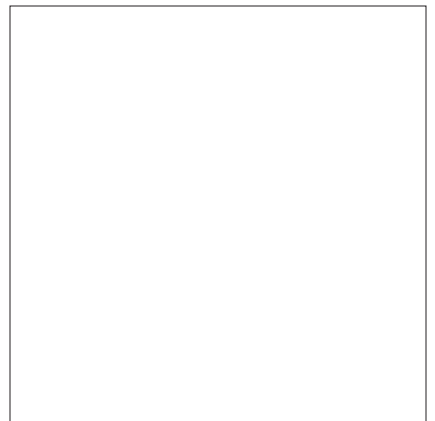
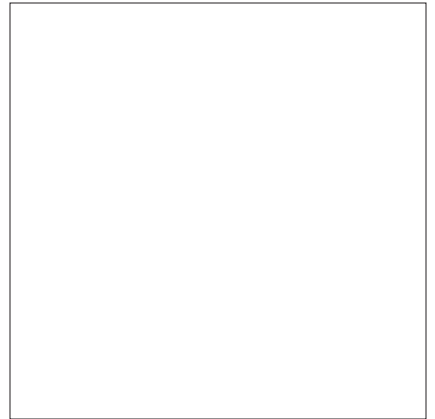
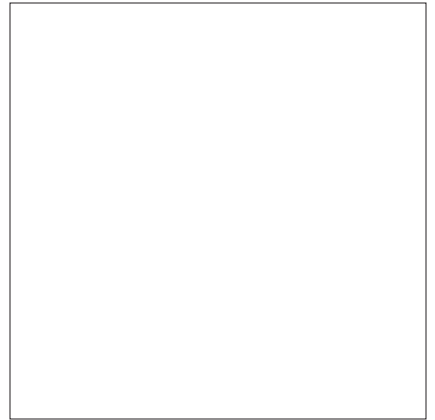
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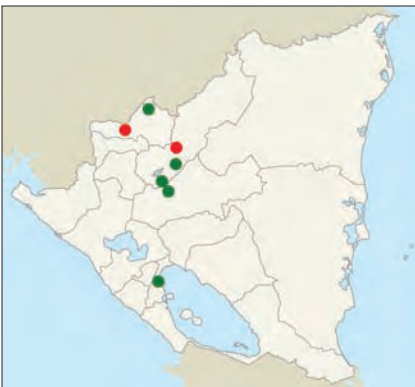
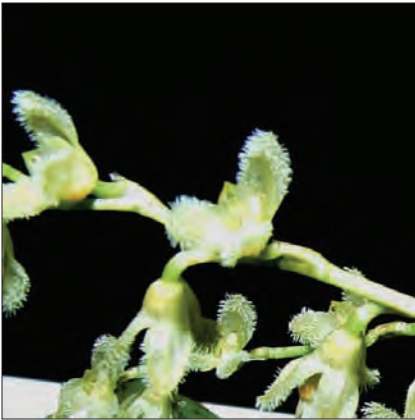
Stelis cucullata



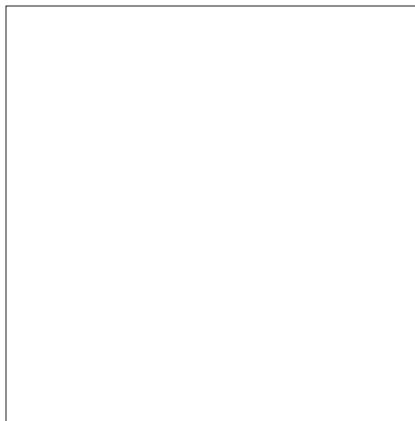
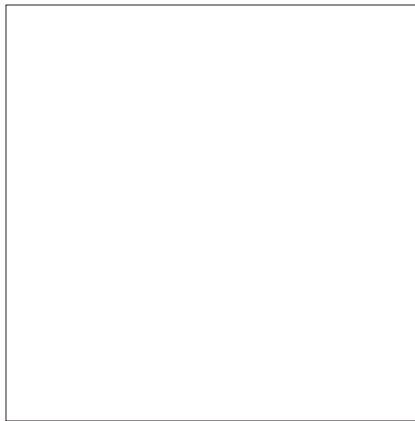
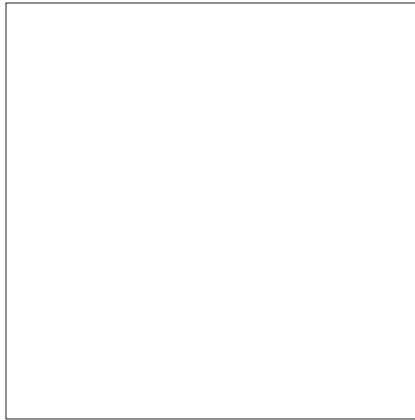
Stelis deregularis



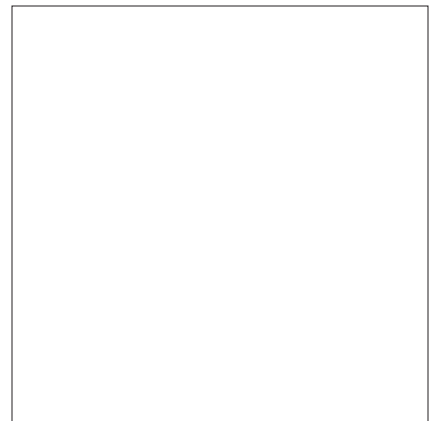
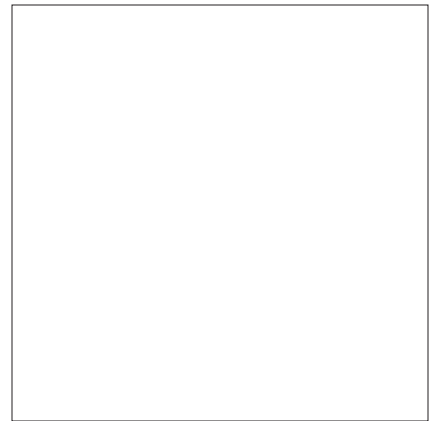
Stelis gelida



Stelis glossula



Stelis gracilis



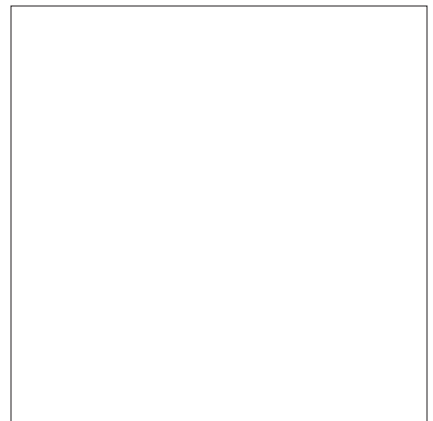
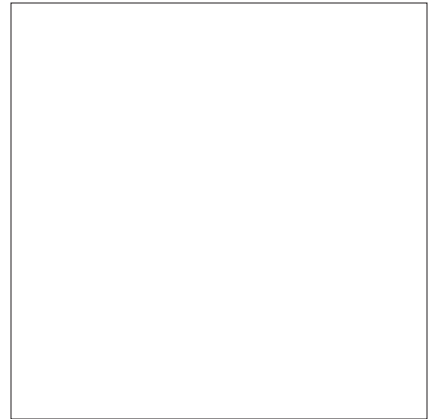
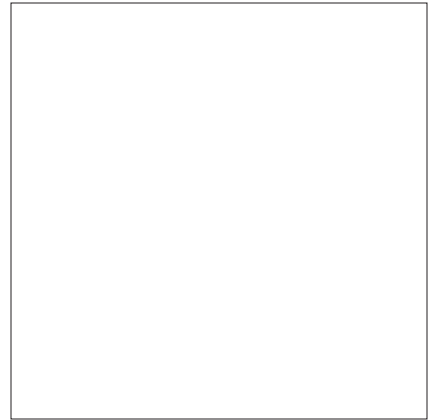
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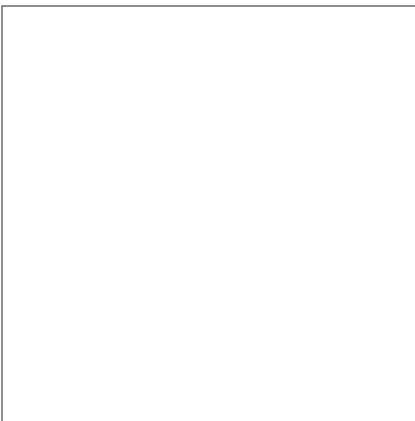
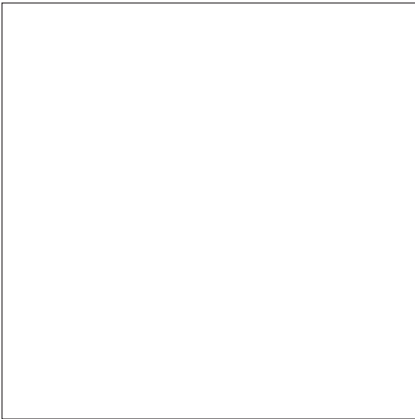
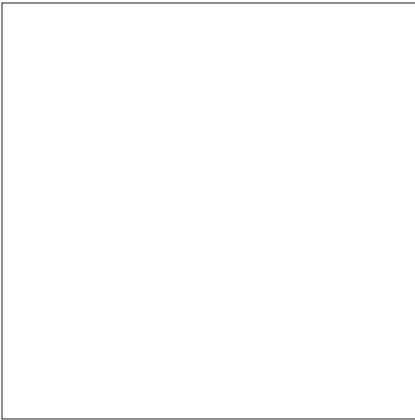
Stelis immersa



Stelis inaequalis



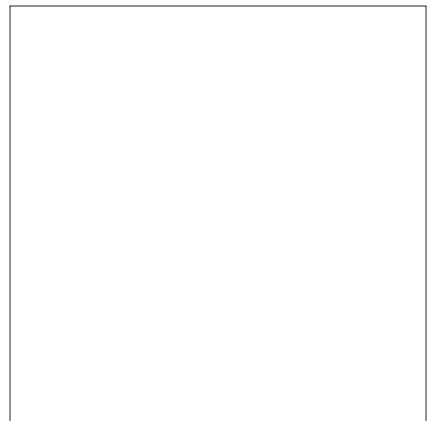
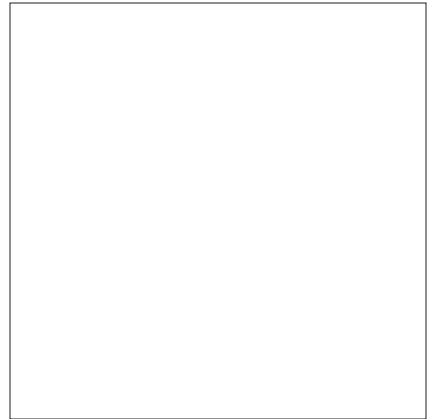
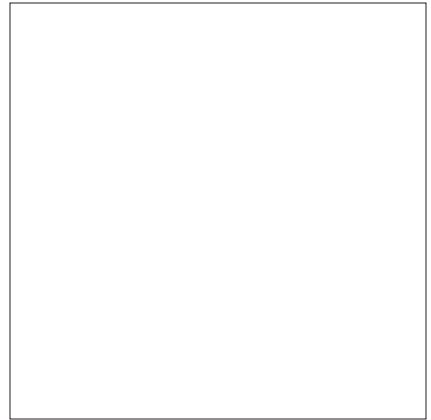
Stelis longipetiolata



Stelis megachlamys



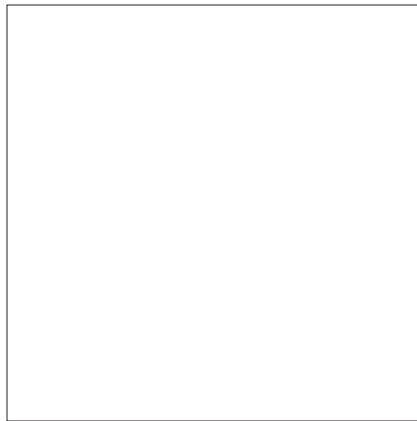
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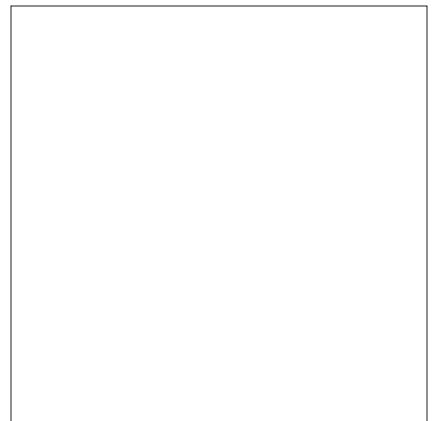
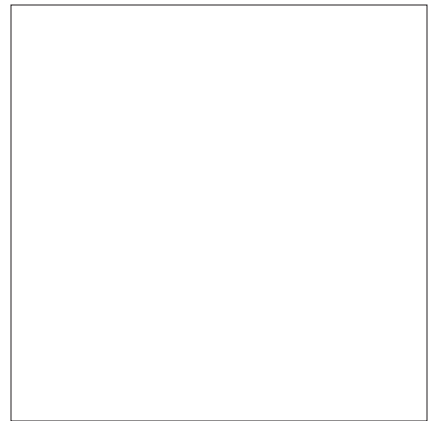
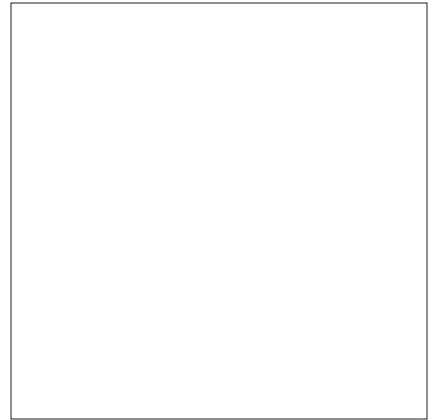
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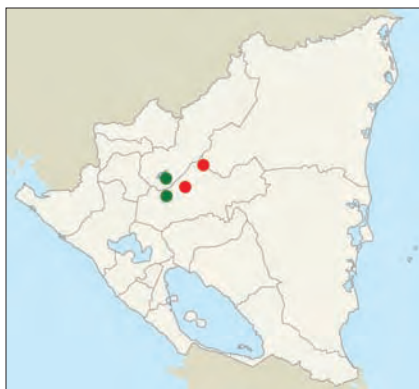
Stelis powellii



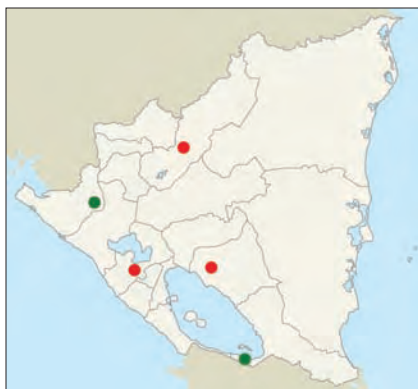
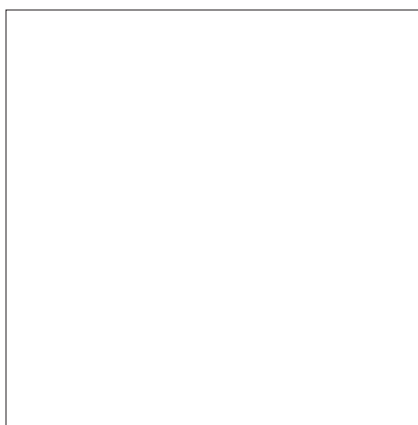
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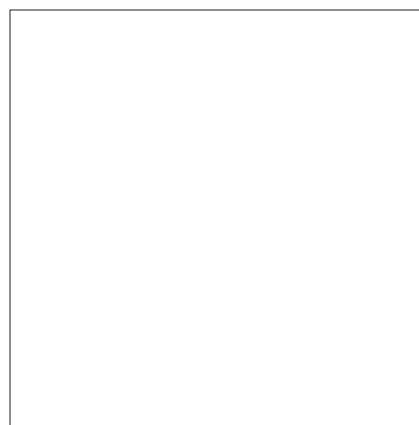
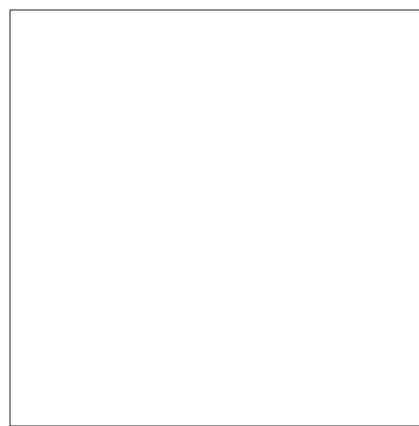
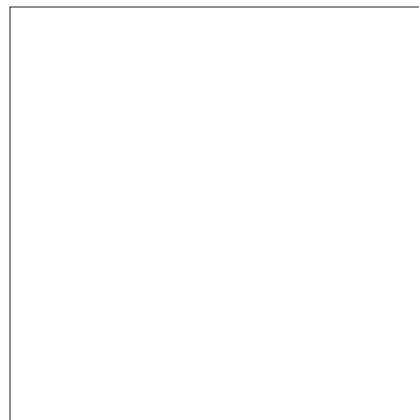
Stelis purporascens



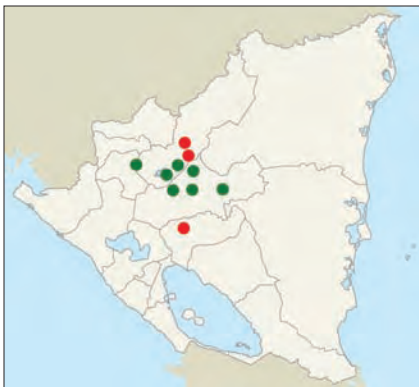
Stelis quadrifida



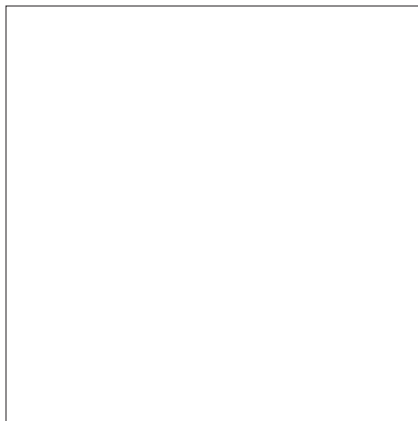
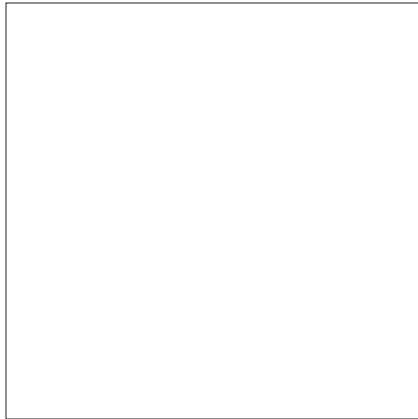
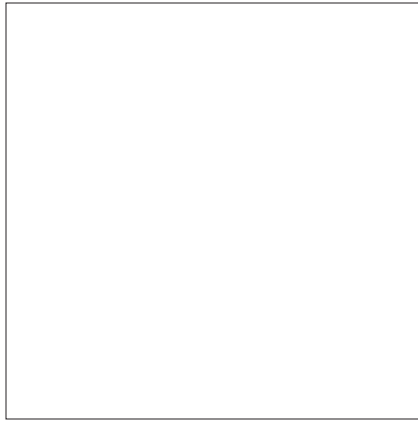
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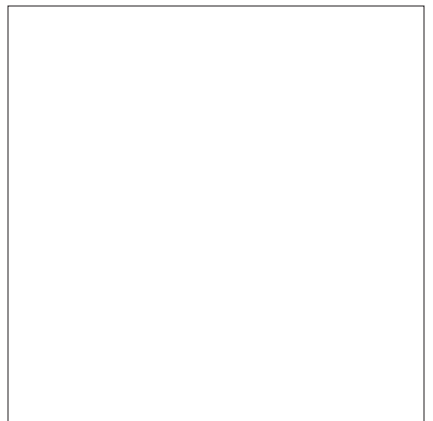
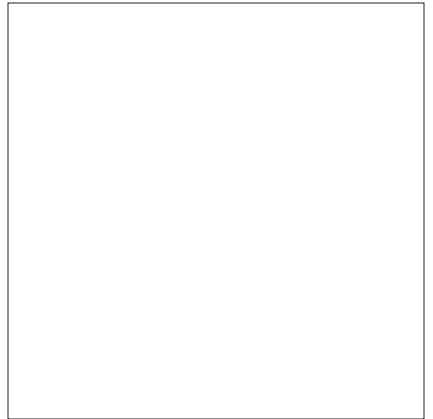
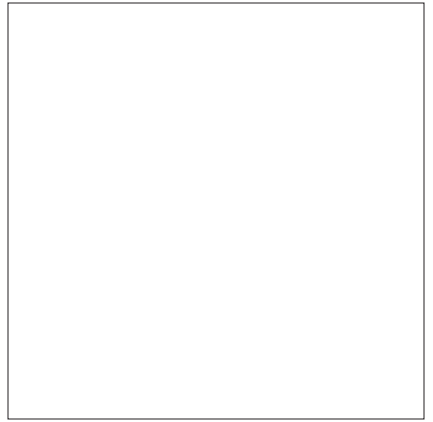
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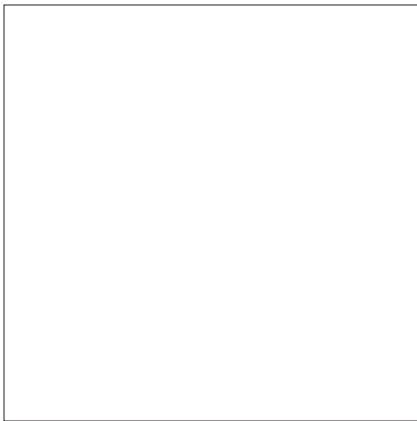
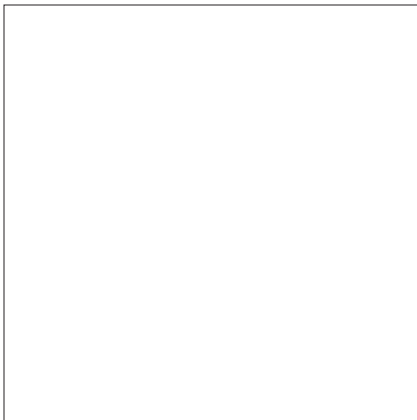
Stelis wercklei



Stelis williamsii



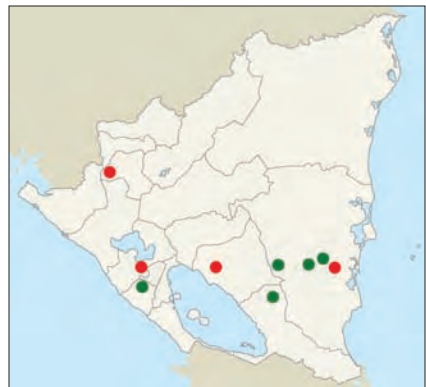
Stellilabium helleri



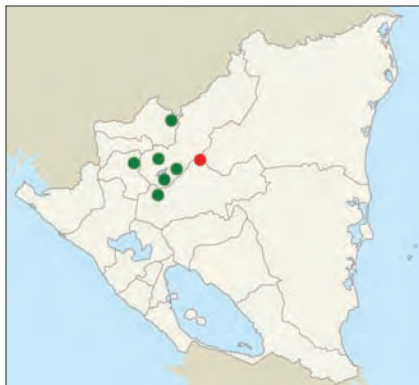
Stenorrhynchos aurantiacum



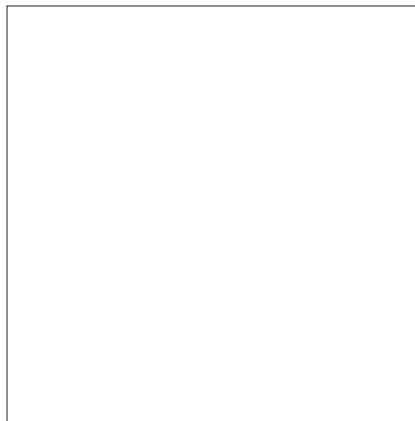
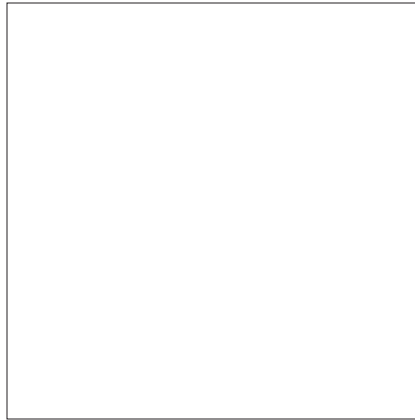
Stenorrhynchos lanceolata



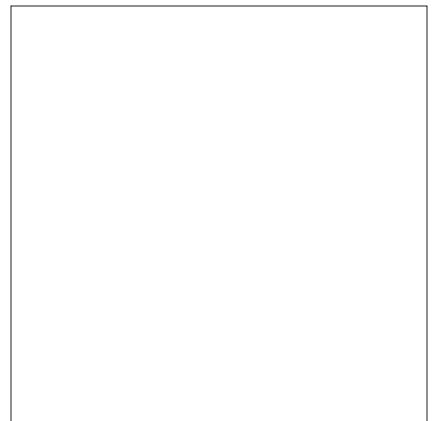
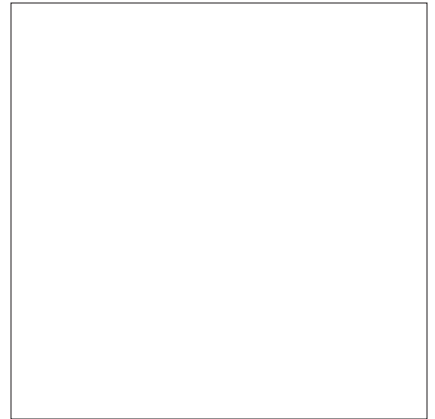
Stenorrhynchos speciosum



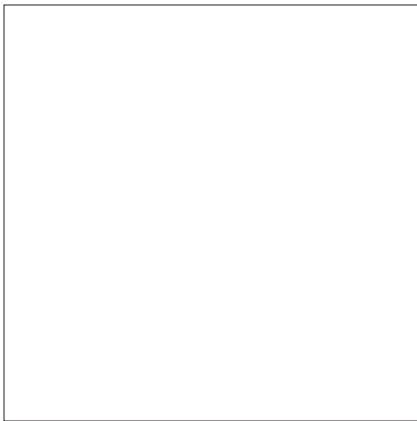
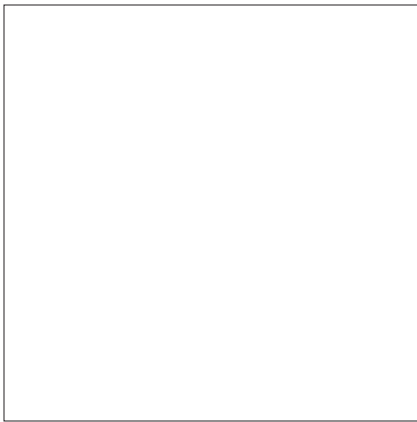
Stenotyla helleri



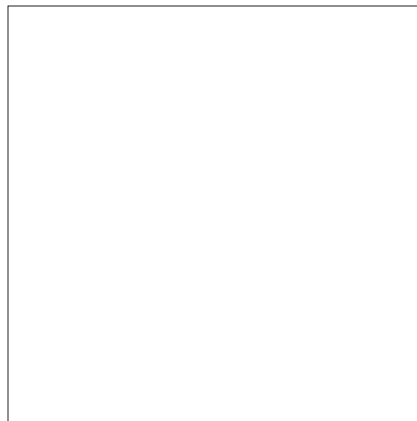
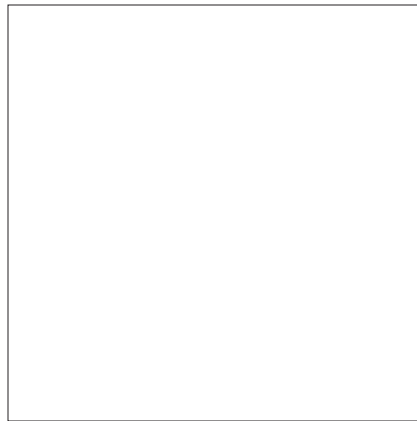
Stenotyla lendyana



Teuscheria pickiana



Ticoglossum krameri



Ticoglossum krameri var *alba*



Trevoria glumacea



Trevoria zahlbruckneriana



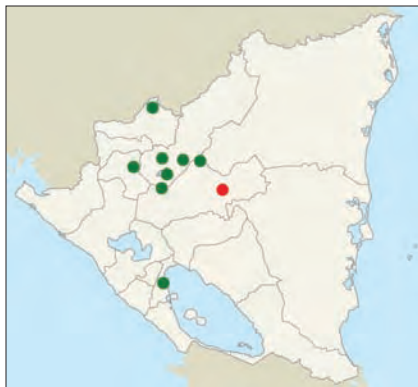
Trichopilia galeottiana



Trichopilia marginata



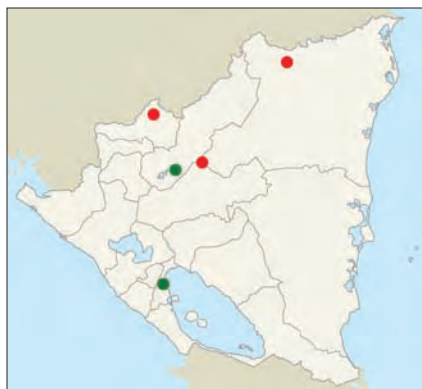
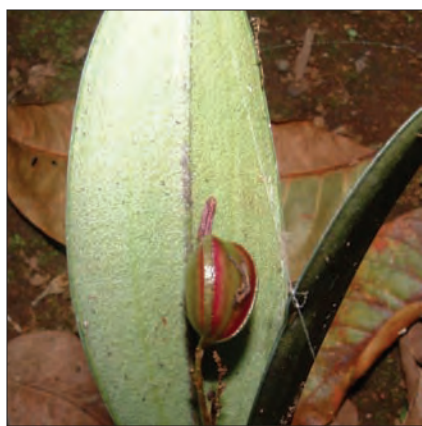
Trichopilia tortilis



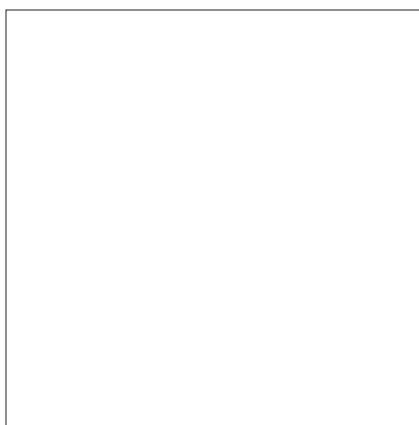
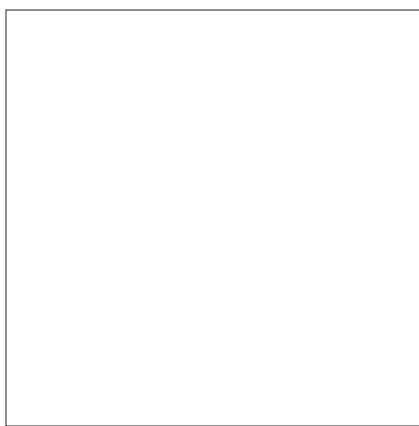
Trichopilia turrialvae



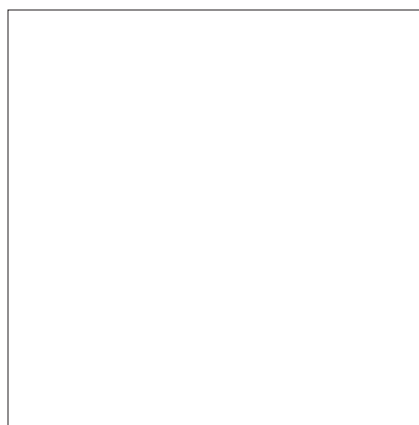
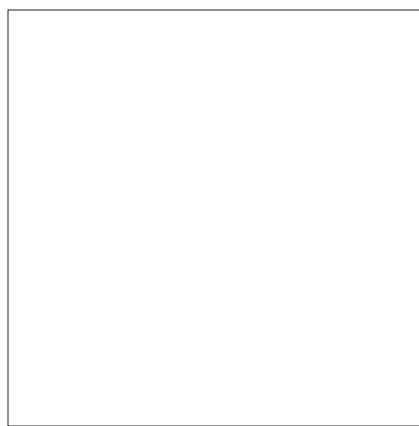
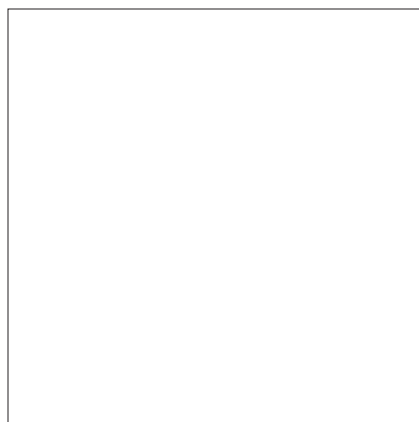
Trichosalpinx blaisdellii



Trichosalpinx cedralensis



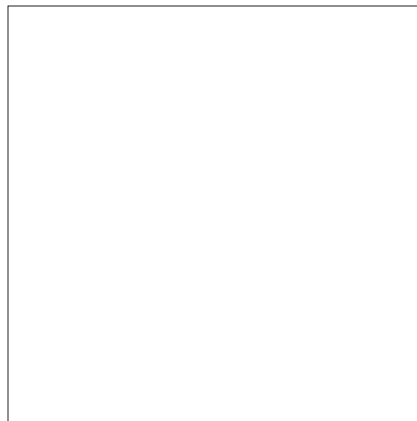
Trichosalpinx dura



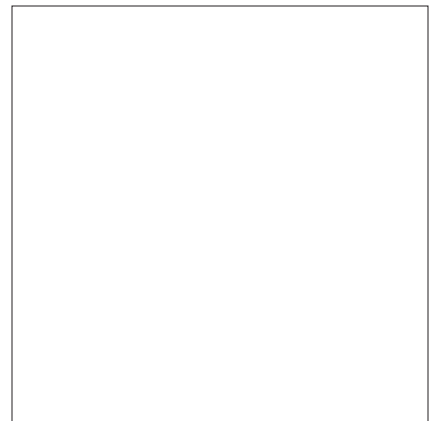
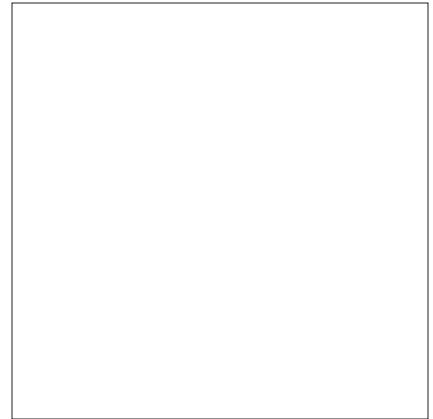
Trichosalpinx foliata



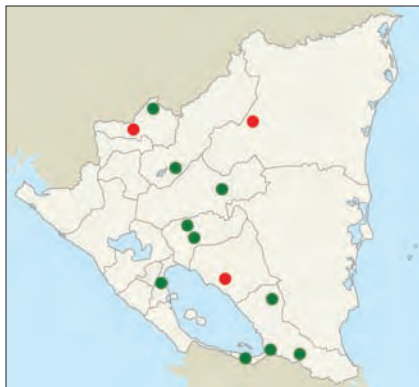
Trichosalpinx memor



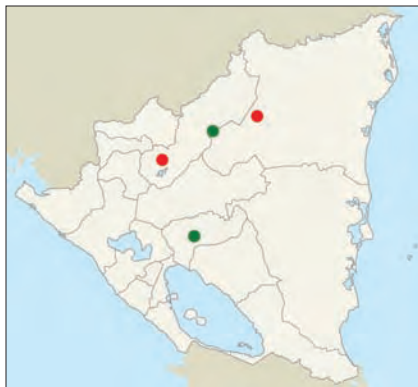
Trichosalpinx orbicularis



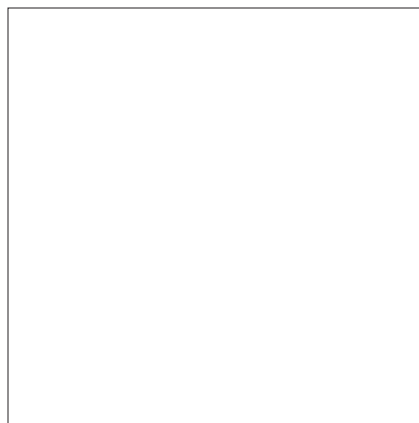
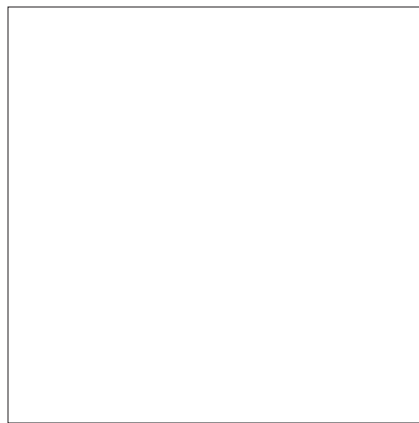
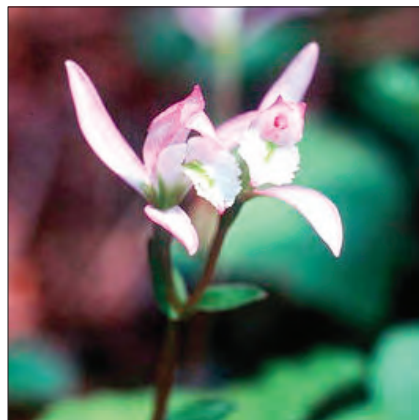
Trigonidium egertonianum



Trigonidium seemanni



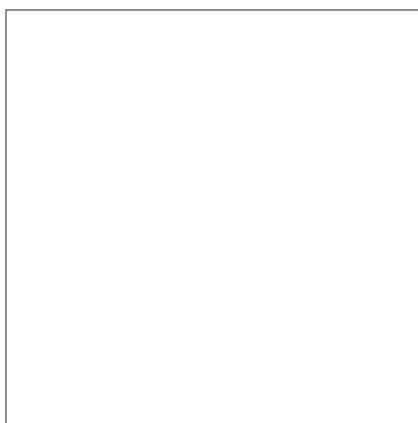
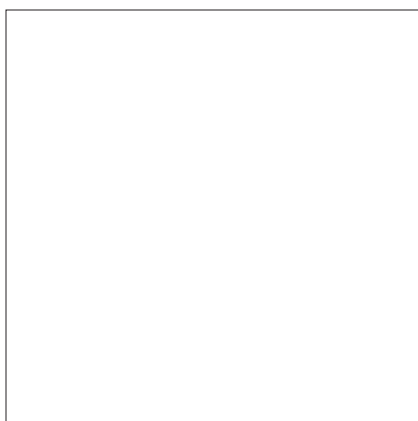
Triphora trianthophora



Tropidia polystachya



Vanilla helleri



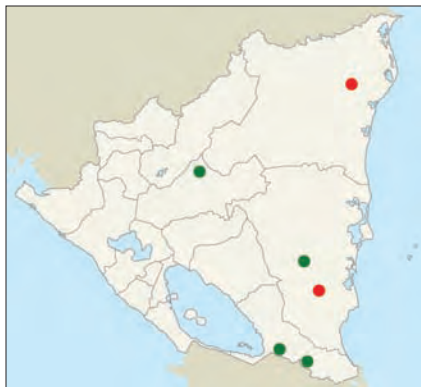
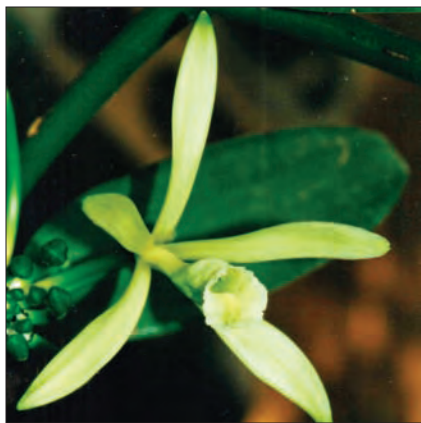
Vanilla inodora



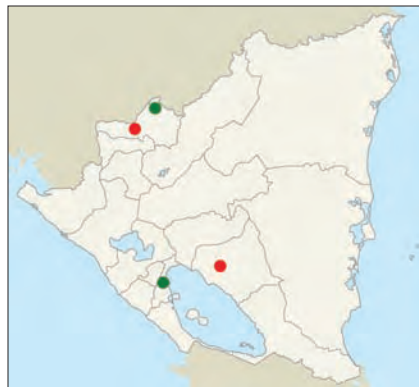
Vanilla odorata



Vanilla planifolia



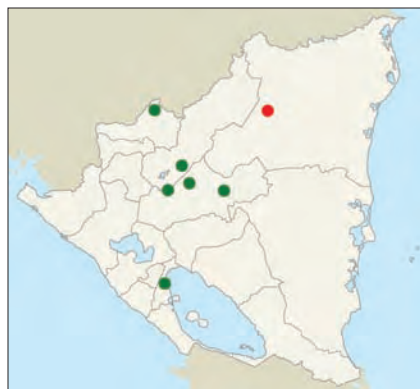
Vanilla pompona



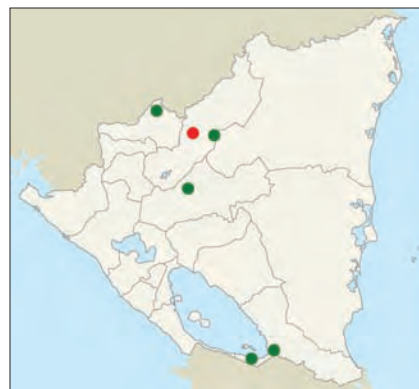
Warrea costaricensis



Xylobium elongatum



Xylobium foveatum



Xylobium pallidiflorum



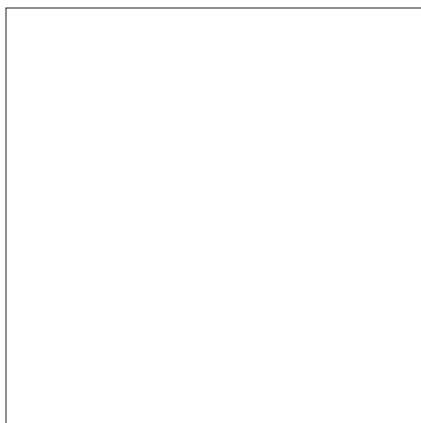
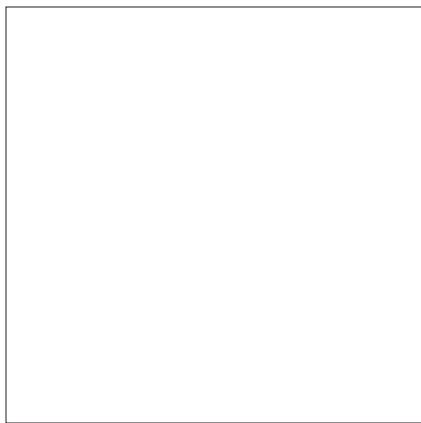
Xylobium sulfurinum



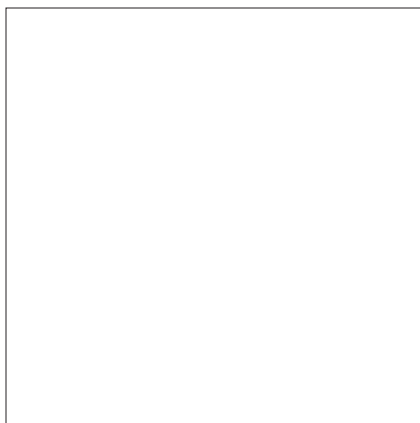
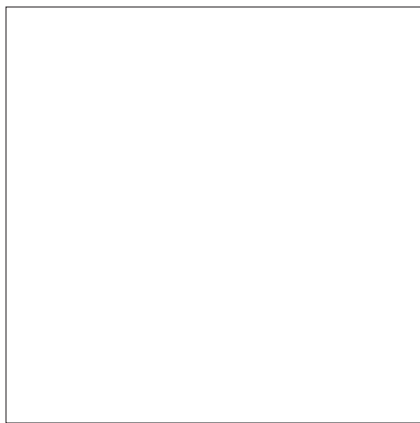
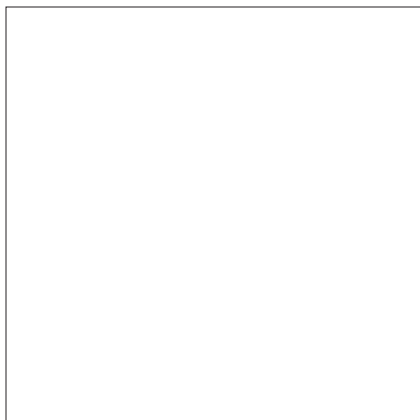
Zootrophion endresianus



Zootrophion gracilentus



Zootrophion moorei



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Lepanthes helleri (1,2)
Malaxis histionantha (1)
Maxillaria tigrina (1)
Mormodes skinneri (2)
Pleurothallis lewisae (2,3)
Pleurothallis pruinosa(1,2)
Pleurothallis seratularoides(2,3)
Specklinia glandulosa (1,2,3)
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Trichopilia galeottiana

Enoc Pineda

Dichaea graminoides

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