

Costa Rica, Land Of Endless Orchids

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WITH ALMOST 1,600 REPORTED species (Karremans et al. 2012), Costa Rica has one of the richest orchid floras in tropical America, currently surpassed in total species number only by Brazil, Colombia, Ecuador and Peru (Govaerts et al. 2011). However, with an area of only 19,691 square miles (51,000 km, Costa Rica is five to 150 times smaller than any of those countries and therefore probably has the highest orchid species-to-area ratio in the world.



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The high number of reported orchid species is clearly a direct result of the combination of high diversity and intense botanical exploration by several of the most renowned figures from the 19th and 20th centuries. The Costa Rican collections of A. Alfaro, A. and C. Brade, A. Brenes, A.R. Endrés, C. Lankester, R. Pfau and P. Standley were studied by the most relevant

orchidaceous authorities of the 19th and 20th centuries, especially O. Ames, H.G. Reichenbach f., R. Schlechter and C. Schweinfurth. More recently J. Atwood, R.L. Dressler, E. Hágsater, R.L. Rodríguez, C.A. Luer and D.E. Mora-Retana explored Costa Rica thoroughly for their own research (Ossenbach 2004). However, coincidentally they never (or rarely) explored the country's South Pacific region.

In the last few years sporadic exploration in the Costa Rican South Pacific, an area that extends (as defined here) from the valley of San Isidro to the hills of Coto Brus to the south and from the coastal plains of Osa in the west to the Amistad International Park in south-central Costa Rica, resulted in the discovery of several impressive new species of orchids. *Brassia suavissima* Pupulin & Bogarín, *Gongora boracayanensis* Jenny, Dalström & W.E. Higgins, *Lycaste bruncana* Bogarín, *Oncidium henning-jensenii* Pupulin & Bogarín, *Polycynis blancoi* G. Gerlach and others have been published recently



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based on material from the Costa Rican South Pacific.

Since 2010, the staff of Lankester Botanical Garden (JBL) of the University of Costa Rica have carried out a series of more intense botanical expeditions to this area with a focus on Orchidaceae. By March 2011 a dozen new species and records in Costa Rican Orchidaceae had been discovered among collected material. In separate newspaper articles, Karremans and Pupulin had suggested that although it was possible to already confirm such a high number of novelties, it was likely that more novelties would be discovered among the plants examined. In fact, we can now say that more than 50 species are being studied intensively by the staff at JBL, most of which (if not all) will turn out to be new species or records for the country. Judging from the fact that no visit by experts to this area turns up empty-handed, it is clear that more novelties will continue to appear with future exploration.

The expeditions were financed by the vice president of research of the University

[1] *Lepanthes antilocapra*, one of the new records for Costa Rica

[2] *Epidendrum alieniferum*, one of the newly described species from the South Pacific region.

[3] *Lepanthes otopetala*, previously known only from Panama

of Costa Rica, supported by JBL's director Jorge Warner and department coordinator Franco Pupulin, and undertaken by a team led by Diego Bogarín and Adam P. Karremans and variously accompanied by Melania Fernández and Christina Smith among others. The plant material was collected under the scientific research permits extended by the Ministry of Environment, Energy and Seas (MINAE) of Costa Rica and is being cultivated at JBL. The permits allowed for exploration in the undisturbed protected areas including Corcovado National Park, La Amistad National Park and Las Tablas Protected Zone.

Among the plant specimens collected are novelties in the subtribes Laeliinae,



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Maxillariinae, Oncidiinae, Sobraliinae and Zygopetalinae, although by far the Pleurothallidinae accounts for the largest group. It is not a coincidence that those are also the six main subtribes of interest for the staff at JBL and therefore it is also likely that novelties in other less-studied subtribes will also turn up with time.

Although it may not be the first time that some of these species have been collected in Costa Rica, they have never been reported before. Now with material at hand, they can be studied more carefully. Already 12 of these species have been described as new (Table 1). Additionally, among the recently discovered species, 12 more are reported as new records for the country, species that are not new to science but are new to Costa Rica (Table 2). Meanwhile, 32 other

Table 1. Newly Described Species

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| <i>Dracontia lueriana</i> Karremans |
| <i>Dracontia pileata</i> Karremans & Bogarín |
| <i>Dracontia viridi-flava</i> Karremans & Bogarín |
| <i>Epidendrum alieniferum</i> Karremans & Bogarín |
| <i>Epidendrum</i> × <i>sandiorum</i> Hágsater, Karremans & L.Sánchez |
| <i>Lepanthes erubescens</i> Bogarín & Karremans |
| <i>Lepanthes expansilabia</i> Bogarín & C.M.Sm. |
| <i>Lepanthes sandiorum</i> Bogarín & Karremans |
| <i>Lepanthes sanjuanensis</i> Bogarín & Karremans |
| <i>Pleurothallis adventurae</i> Bogarín & Karremans |
| <i>Specklinia remotiflora</i> Pupulin & Karremans |
| <i>Trichocentrum pupulinianum</i> Bogarín & Karremans |

Table 2. Newly Recorded Species

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| <i>Dracula maduroi</i> Luer |
| <i>Epidendrum cystosum</i> Ames |
| <i>Lepanthes ankistra</i> Luer & Dressler |
| <i>Lepanthes antilocapra</i> Luer & Dressler |
| <i>Lepanthes maxonii</i> Schltr. |
| <i>Lepanthes odontolabis</i> Luer |
| <i>Lepanthes otopetala</i> Luer |
| <i>Lepanthes psyche</i> Luer |
| <i>Lepanthes regularis</i> Luer |
| <i>Pleurothallis instar</i> Luer |
| <i>Sobralia suaveolens</i> Rchb.f. |
| <i>Specklinia pfavii</i> (Rchb.f.) Pupulin & Karremans |

species are currently being researched in depth at JBL, including one species each of the genera *Campylocentrum* Benth., *Dichaea* Lindl., *Masdevallia* Ruiz & Pav., *Maxillariella* M.A. Blanco & Carnevali and *Stelis* Sw., a new species and a new variety of *Prosthechea* Knowles & Westc., two species of *Platystele* Schltr., three of *Epidendrum* L., five of *Pleurothallis* R. Br., five of *Specklinia* Lindl. and an astonishing ten species of *Lepanthes* Sw. About half have already been proposed as being new to science and are soon to be published in several different publications.

It is not yet clear how many new discoveries will finally be described from among the plants found, or how many more will be found in additional expeditions; however, considering that large numbers of new discoveries have been found in the last few years from all around the country, it would be quite naive to think that a survey of Costa Rican orchid flora is close to

completion. No time soon will we have the answer to the question of how many species of orchids there are in Costa Rica.

What is important right now is that the joint efforts between the MINAE and JBL promote conservation of the biodiversity of Costa Rica through the establishment of a range of protected areas (in situ) and by stimulating documentation (ex situ).

Acknowledgments

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Adam P. Karremans is a researcher at the Lankester Botanical Gardens of the University of Costa Rica. His areas of interest include systematics and evolution of Orchidaceae, especially in the Pleurothallidinae and Laeliinae. He is working on several projects combining molecular, morphological and geographical evidence to explain evolutionary relationships between species, as well as floristic and monographic work. He is currently a PhD candidate at Universiteit Leiden. Jardín Botánico Lankester, Universidad de Costa Rica, P.O. Box 302-7050 Cartago, Costa Rica or NCB Naturalis, NHN Universiteit Leiden, The Netherlands (email adam.karremans@ucr.ac.cr). Diego Bogarín is particularly interested in the evolution and systematics of Neotropical Orchidaceae. He is developing floristic projects for conservation in Costa Rica and Panama and has participated in research projects on DNA barcoding and orchid conservation with the Royal Botanic Gardens, Kew. He is an orchid taxonomist at Lankester Botanical Gardens and a research associate of the Herbario UCH of the Universidad Autónoma de Chiriquí, Panamá. Bogarín has published a number of scientific

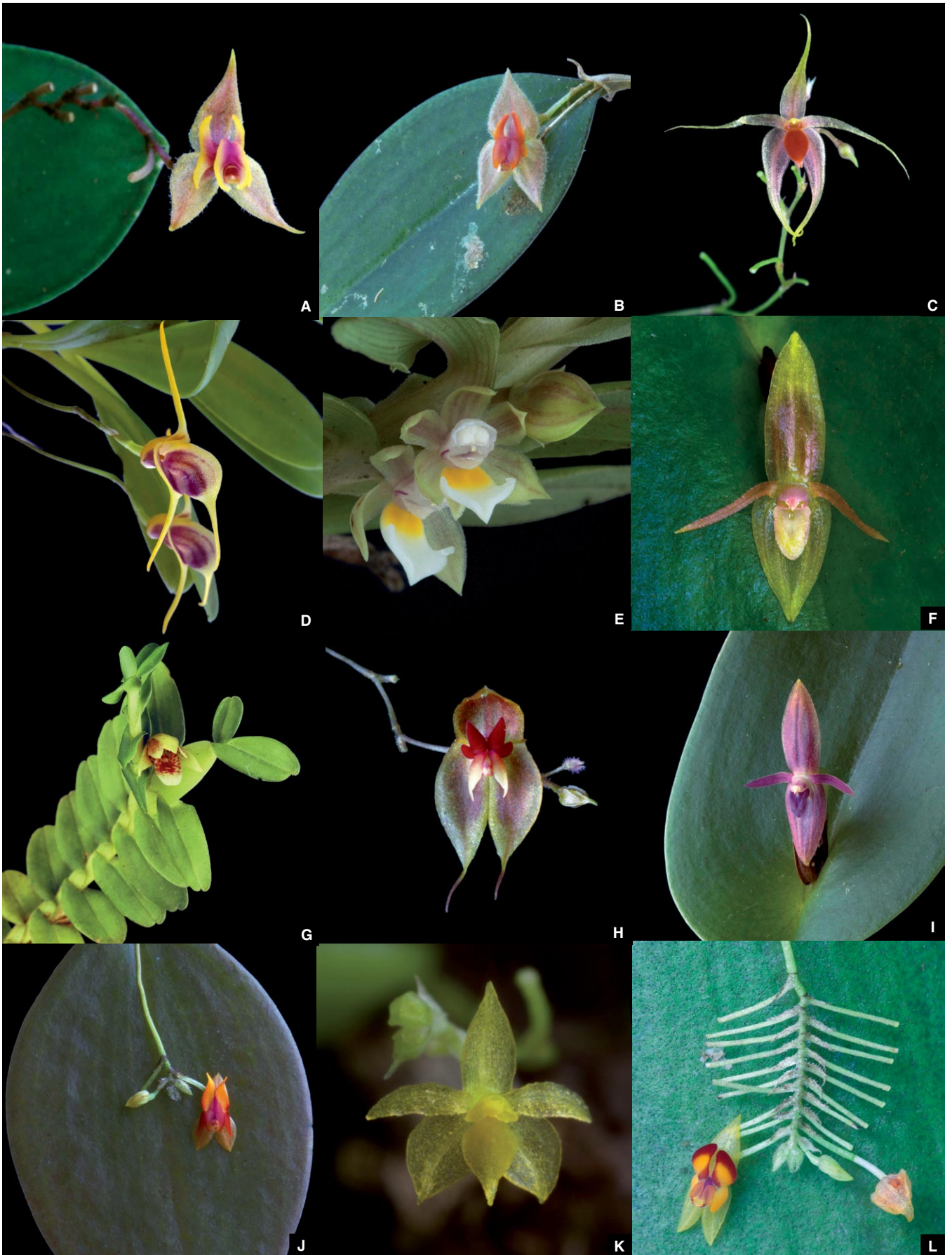


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papers on the orchid flora of Costa Rica and other Neotropical regions. NCB Naturalis, NHN Universiteit Leiden, The Netherlands (email diego.bogarín@ucr.ac.cr)

- [4] An unusual albinistic form of *Prosthechea campylostalix*, widespread in Central America
- [5] *Specklinia pfavii*, previously unknown from Costa Rica
- [6] *Pleurothallis adventurae*, another of the newly described species from this study



[7] A montage of some of the many, to be named, novelties recently found in the Costa Rican south-pacific region. Photograph 7D courtesy of C.M. Smith, all others of D. Bogarín and A.P. Karremans