

NEW SPECIES AND RECORDS IN MESOAMERICAN LEPANTHES

FRANCO PUPULIN, DIEGO BOGARÍN & DANIEL JIMÉNEZ

IN THE LAST TWO DECADES intensive efforts have been made to complete the inventory of the Costa Rican Orchidaceae. Despite this work, floristic novelties in this family still appear regularly as a result of increased botanical exploration. This is particularly true for the small-sized and often overlooked members of the subtribe Pleurothallidinae, a large and diverse Neotropical group whose species are frequently characterized in Central America by a narrow geographic distribution (Ossenbach et al., 2007). After the early contributions by Reichenbach (1866), Schlechter (1923), and Ames (1923), and the fundamental work by Luer in the last several decades (1987, 2003), which revealed the great diversity of the genus *Lepanthes* Sw. in Costa Rica, this group received little attention by botanists, and only a few new species have been described in recent years (Pupulin 2001, 2003; Pupulin & Bogarín 2004).

The situation is even worse for Panama, which lacks a modern systematic treatment of *Lepanthes* comparable to that done by Luer (2003) for Costa Rica. The catalogue of Panamanian vascular plants by Correa et al. (2004) lists just 32 species in the genus, missing a number of taxa previously published for the country. Ossenbach et al. (2007), on the other hand, recorded 56 species for Panamanian flora, but this is surely an underestimate especially compared with the 104 species documented for Costa Rica, or with species diversity in other groups of Panamanian orchids that have received greater taxonomic attention (e.g., Dressler & Bogarín 2007). On the other hand, efforts by tropical botanists to deal with systematic revisions of *Lepanthes* on a regional scale have been hampered by several factors: the large number of names published in *Lepanthes* (close to 1200 according to Govaerts, 2005); the poor understanding of species concepts often based on badly preserved (when not missing or destroyed) type material; and the difficulty in accessing the scattered scientific literature on the genus.

It is worth noting that the three new species of Costa Rican *Lepanthes* described here were collected during a single field trip to the species-rich and botanically undersampled area of Queverí, located between Macho Gaff and Orosi, in the Tapantí-Macizo de la Muerte National Park. Here they form quite large populations and are locally abundant. Other collections of *Lepanthes* from the same locality are still under study, but it is likely that additional new species from this locality will be described in the near future.

Two species of *Lepanthes* are recorded here for the

flora of Costa Rica for the first time, and four new species from Costa Rica and Panama are described and illustrated:

Lepanthes droseroides Luer, *Lindleyana* 2(4): 188. 1987. TYPE: PANAMA. Chiriquí: Cerro Punta, collected by A. Maduro 19-M., *C. Luer* 11632 (holotype, MO).

Plant epiphytic, caespitose, to 10 cm tall. **Roots** flexuous, ca. 1 mm in diameter. **Ramicaul** suberect to erect, slender, 2-5.5 cm long, enclosed by 3-6 tightly fitting, blackish lepanthiform sheaths, ostia short, with minutely ciliate margins. **Leaf** ovate to orbicular, acute, coriaceous, slightly concave, 1.7-2.7 x 1.8-2.8 cm, the cuneate base contracted into an indistinct petiole. **Inflorescence** a congested, distichous, successively several-flowered raceme borne behind the leaf, sometimes 3-4 inflorescences produced at once per leaf, to 1-2.5 cm long including the slender peduncle to 1.2 cm long. **Floral bracts** broadly ovate, acute, amplexant, to 1 mm long. **Pedicel** terete, to 2 mm long. **Ovary** subclavate, 1 mm long, with low, thin, slightly winged ribs. **Flowers** non resupinate, spreading, with whitish yellow sepals, the petals yellow, the upper lobe blotched with dark orange-red, the lower lobe yellow at apex, the lip orange-red, the column red, the anther whitish. **Dorsal sepal** ovate-triangular, acute, 3-nerved, 2.8 x 1.7 mm, connate to the lateral sepals for 0.5 mm. **Lateral sepals ovate**, acute, abaxially subcarinate toward the apex along the midvein, connate to about the middle into a synsepalum 2.5 x 1.5 mm. **Petals** transversely bilobed, 0.8 x 3.1 mm, the upper lobe ovate, acute, 2.2 x 0.8 mm, the lower lobe ovate, acute, smaller than the upper lobe, 0.7 x 0.5 mm. **Lip** bilaminar, 1.3 x 1.2 mm, the blades narrowly ovate, subacute, the apex subfalcate, the connectives broadly cuneate, the body basally connate to the column, the sinus narrow, with an external, conspicuous, thickly ligulate, upcurved, pubescent appendix. **Column** slender, to 0.7 mm long, with subapical stigma and dorsal anther. **Anther cap** ovate, 2-celled. **Pollinia** 2, pyriform, with viscidium.

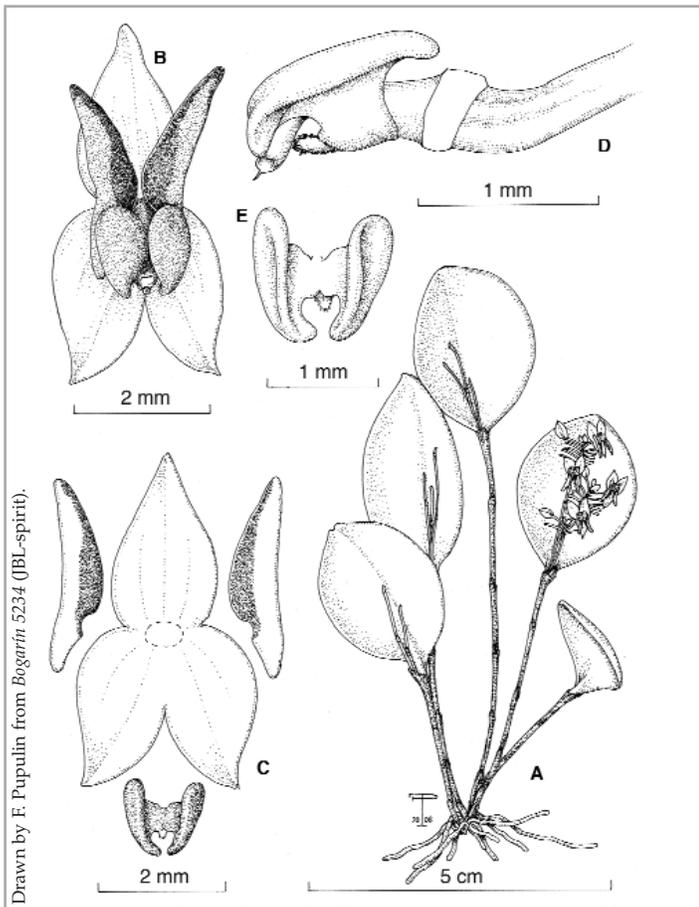
ETYMOLOGY: named for the resemblance of the appendix to a leaf of a sundew in the genus *Drosera* (Droseraceae). From the Greek *droseros*, or "dewy", referring to droplets on the long-pubescent leaves of *Drosera*.

DISTRIBUTION: known only from the Talamanca mountain range in Costa Rica and Panama.

HABITAT: epiphytic in montane wet forest at 2700-2800 m elevation.

COSTA RICAN MATERIAL STUDIED: Cartago: El Guarco, San Isidro, Salsipuedes, road to Dos Amigos, southern Pan-American Highway, km 69-70, 9°38'35.7" N 83°50'44.1" W, 2773 m, epiphytic in montane rain forest, 9 Oct. 2008, *D. Bogarín* 5234, *R. Gómez*, *D. Jiménez*, *F. Pupulin*, & *R. Trejos* (Lankester Botanical Garden-Spirit collection).

Reviewed and approved by two anonymous peers.



Drawn by F. Pupulin from Bogarín 5234 (JBL-spirit).

Figure 1. *Lepanthes droseroides* Luer. A: Habit. B: Flower. C: Dissected perianth. D: Ovary, column, and lip, lateral view. E: Lip, spread.

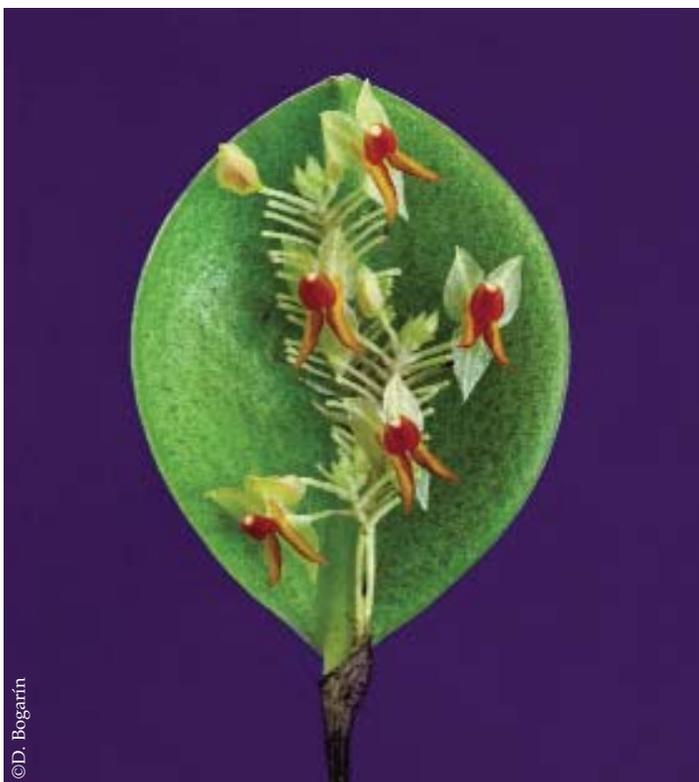
While typical material of *L. droseroides* from Panama presents concolor yellow flowers, in specimens from Costa Rica the petals are orange, with the abaxial portion blotched with a large red band, and the blades of the lip are red. In the type specimen of *L. droseroides* the upper lobe of the petals is somewhat rounder, but other specimens from Panama (i.e., *D. Bogarín* 5695, Lankester Botanical Garden-Spirit collection) agree with the material we observed in Costa Rica. The broadly ovate to orbicular, slightly concave leaf, the tightly fitting, blackish sheaths provided with a short ostia, the three to four inflorescences produced simultaneously beneath the leaf, and the flowers with the upper petal lobe much larger than the lower lobe, easily distinguish *L. droseroides* from other allied species in Costa Rica, namely *L. inornata* Schltr., *L. disticha* Garay & R.E. Schult., and *L. poasensis* Luer.

Lepanthes gratiosa Pupulin & D. Jiménez, *sp. nov.*

TYPE: COSTA RICA. Cartago: El Guarco, San Isidro, Paso Macho (Macho Gaff), after the rangers' headquarters of the Tapantí-Macizo de La Muerte National Park, basin of Río Macho, road to Queverí, 9°43'55.7" N 83°50'02.4" W, 2109 m, epiphytic in rain montane forest, 9 October 2008, F. Pupulin 7350, D. Bogarín, R. Gómez, D. Jiménez & R. Trejos (holotype, CR; isotype, Lankester Botanical Garden-Spirit collection).

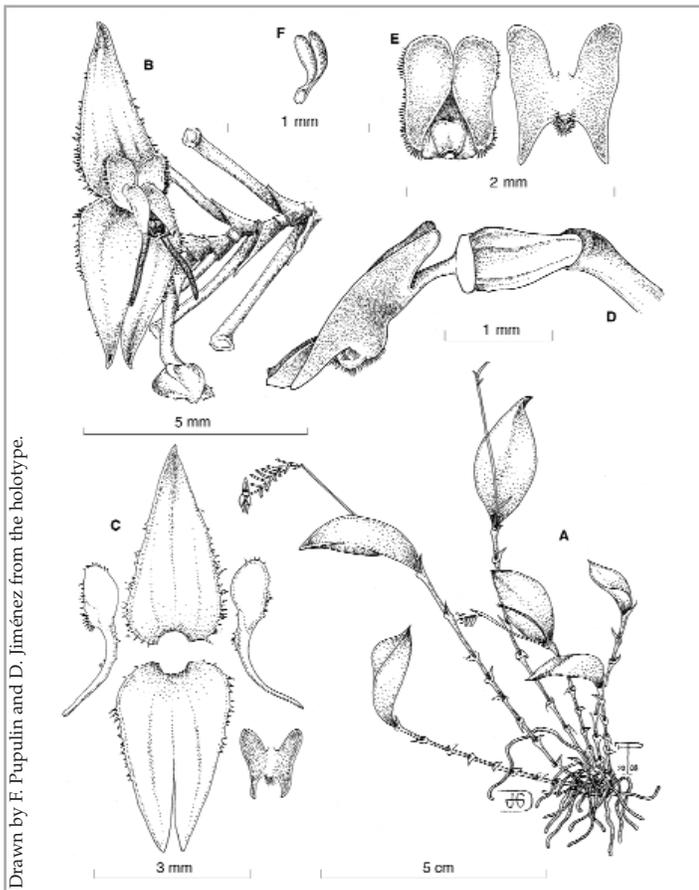
Species Lepanthes sigsigensi Luer et Hirtz similis, inflorescentia congesta, marginibus sepalorum distincte glandularidenticulatis, lobulo inferno petalorum anguste lineare-falcate attenuato, laminis labelli apice minute papilloso differt.

Plant epiphytic, caespitose, to 12 cm tall. **Roots** flexuous, ca. 0.5 mm in diameter. **Ramical** suberect to erect, slender, 3-8 cm long, enclosed by 6-10 lepanthiform sheaths, slightly dilated at the acute, glabrous ostia. **Leaf** elliptic, acute, sometimes minutely emarginate, thinly subcoriaceous, 2.3-3 x 1.1-1.5 cm, the cuneate base contracted into an indistinct petiole. **Inflorescence** a congested, distichous, successively several-flowered raceme borne in front of the leaf, to 5 cm long including the slender peduncle to 3.5 cm long. **Floral bracts** broadly ovate, acuminate, amplexent, sparsely glandular, to 1.2 mm long. **Pedicel** terete, to 3.5 mm long. **Ovary** subclavate, 1 mm long, with low, thin, slightly undulate wings. **Flowers** resupinate, spreading, with greenish yellow sepals, the petals yellow, the upper lobe blotched with dark orange-red, the lower lobe bright yellow at apex, the lip orange-red, flushed dark purple toward the apex of the blades, 0.3 x 3 mm. **Dorsal sepal** ovate-triangular, acute, 3-nerved, the margins glandular-denticulate, 3.8 x 1.9 mm, connate to the lateral sepals for 0.5 mm. **Lateral sepals** narrowly triangular, acute, abaxially subcarinate toward the apex along the midvein, the external margins glandular-denticulate, connate to about the middle into a synsepalum 3.5 x 2.2 mm. **Petals** transversely bilobed, 0.6 x 3.5 mm, the upper lobe elliptic-obovate, densely ciliate along the margins, 0.6 x 1.2 mm, the lower lobe narrowly linear-falcate, attenuate, sparsely ciliate along the margins, 0.3 x 3 mm. **Lip** bilaminar, 1.3 x 1.1 mm, the blades narrowly ovate, subacute, minutely pubescent, the connectives broadly cuneate,



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Figure 2. Multiple inflorescences are often produced in *Lepanthes droseroides*, which bears many flowers at a time. This plant was photographed at Lankester Botanical Garden (Pupulin 7180, no voucher).



Drawn by F. Pupulin and D. Jiménez from the holotype.

Figure 3. *Lepanthes gratiosa* Pupulin & D. Jiménez. A: Habit. B: Rachis and flower. C: Dissected perianth. D: Ovary, column, and lip, lateral view. E: Lip, in natural position surrounding column (left) and spread (right). F: Pollinarium.

the body basally connate to the column, the sinus broad, obtuse, with an external, conspicuous, thickly ligulate, upcurved, pubescent-tomentose appendix. **Column** slender, to 1.6 mm long, with subapical stigma and dorsal anther. **Anther cap** ovate, 2-celled. **Pollinia** 2, pyriform, with viscidium.

ETYMOLOGY: from the Latin *gratiosus*, “agreeable”, “delightful”, for the charming shape of the flower.

DISTRIBUTION: known only from the type locality, on the Caribbean watershed of the Talamanca mountain range in Costa Rica.

HABITAT: epiphytic and locally abundant in montane wet forest in Costa Rica at 2100 m elevation.

PARATYPES: same locality and collecting date of the holotype, *F. Pupulin et al.* 7344 (Lankester Botanical Garden-Spirit collection); *F. Pupulin et al.* 7345 (Lankester Botanical Garden-Spirit collection); *F. Pupulin et al.* 7348 (Lankester Botanical Garden-Spirit collection); *D. Bogarín et al.* 5278 (Lankester Botanical Garden-Spirit collection).

Lepanthes gratiosa is most similar to *L. sigsigensis* Luer & Hirtz, from southern Ecuador, and to other species of *Lepanthes* with flowers borne on a long inflorescence much longer than the leaf. It differs from *L. sigsigensis* by the congested (vs. loose) raceme, the distinctly glandular-denticulate (vs. entire) sepal margins, the narrowly linear-falcate, attenuate (vs. oblong, obtuse) lower lobe of the petals, and the minutely papillose (vs. glabrous) blades of the lip. Like *L. sigsigensis*, *L. gratiosa* is apparently restricted to cold and



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Figure 4. The flowers of *Lepanthes gratiosa* are borne on a relatively long inflorescence that surpasses the leaf (Pupulin 7344).



©F. Pupulin

Figure 5. The narrow, linear lower lobes of the petals are characteristic of *Lepanthes gratiosa* (Pupulin 7344).

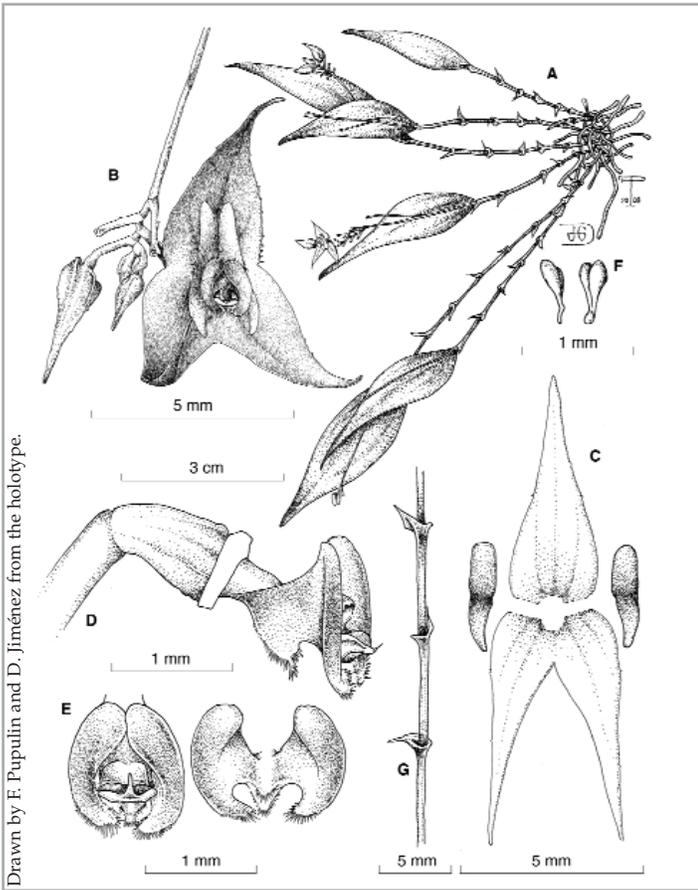
constantly wet cloud forests at high elevations.

Lepanthes machogaffensis Pupulin & D. Jiménez, *sp. nov.*

TYPE: COSTA RICA. Cartago: El Guarco, San Isidro, Paso Macho (Macho Gaff), after the rangers' headquarters of the Tapantí-Macizo de La Muerte National Park, basin of Río Macho, road to Queverí, 9°43'18.3"N 83°50'29.7"W, 2234 m, epiphytic in rain montane forest, 9 October 2008, F. Pupulin 7308, D. Bogarín, R. Gómez, D. Jiménez & R. Trejos (holotype, CR; isotype, Lankester Botanical Garden-Spirit collection).

A Lepanthe glabella Luer et Hirtz *colore florum, sepalis marginibus sparse ciliatis, lobulo infero petalorum anguste ovato, laminis labelli reniformi-subfalcatis apicibus uncinatis, appendice externa recedit.*

Plant epiphytic, caespitose, to 12 cm tall. **Roots** flexuous, ca. 1 mm in diameter. **Ramicaul** suberect to gently pendent, slender, to 7.5 cm long, enclosed by 7-10 lepanthiform sheaths, the apex dilated into an acuminate ostium, minutely ciliate along the margins. **Leaf** narrowly ovate, acute-subacuminate, subcoriaceous, green above, flushed with purple beneath, 3.5-4.5 x 0.7-1.5 cm, the cuneate base contracted into an indistinct petole. **Inflorescence** a congested, distichous, successively several-flowered raceme borne above the leaf, to 4.5 cm long including the filiform peduncle to 3 cm long. **Floral bracts** triangular, acute, amplexent, sparsely glandular, to 1 mm long. **Pedicel** terete, to 4 mm long. **Ovary** subclavate, ca. 1 mm long, with low, thin, distally undulate wings. **Flowers** resupinate, subspreading, with purple-red sepals on a dull



Drawn by F. Pupulin and D. Jiménez from the holotype.

Figure 6. *Lepanthes machogaffensis* Pupulin & D. Jiménez. A: Habit. B: Flower. C: Dissected perianth. D: Ovary, column, and lip, lateral view. E: Lip, in natural position surrounding column (left) and spread (right). F: Pollinarium (two views). G: Detail of the ramicaul and the imbricating sheaths.



©F. Pupulin

Figure 7. The purple flowers with orange-red petals are typical of *Lepanthes machogaffensis* (Pupulin 7307).



©F. Pupulin

Figure 8. The acuminate leaf of *L. machogaffensis*, with the inflorescence reaching the leaf apex. Photo of the plant that served as the holotype.

yellow background, the petals yellow, blotched orange-red along the midline and flushed orange on the adaxial portion of the lobes, the column purple, the anther white. **Dorsal sepal** ovate, acuminate-attenuate, 3-nerved, the margins sparsely ciliate, 7 x 2.5 mm, connate to the lateral sepals for ca. 1 mm. **Lateral sepals** narrowly ovate, attenuate, 3-nerved, with sparsely ciliate margins, 7 x 1.9 mm, connate at the base for ca. 1 mm. **Petals** transversely bilobed, 0.7 x 2.5 mm, the upper lobe subrectangular, rounded-truncate, 0.7 x 1.2 mm, the lower lobe narrowly ovate-subfalcate, subacute, 0.5 x 1.3 mm. **Lip** bilaminate, 1 x 1.2 mm, the blades ovate, concave, slightly carinate along the inner margins, the apex recurved-uncinate, minutely rounded, with longer, stiff hairs, the connectives broadly cuneate, the body basally connate to the column, the sinus protuberant, rounded-subcallose, pubescent, the appendix external, broadly triangular, truncate, pubescent. **Column** terete, stout, to 1.3 mm long, with apical stigma and dorsal anther. **Anther cap** transversely elliptic, 2-celled. **Pollinia** 2, pyriform, with viscidium.

ETYMOLOGY: named from the type locality, Macho Gaff.

DISTRIBUTION: known only from Costa Rica, on the Macizo de la Muerte, part of the Talamanca mountain range.

HABITAT: epiphytic and apparently uncommon in the montane wet forests of the Caribbean watershed in the Talamanca mountain range, Costa Rica, at 2200-2300 m elevation.

PARATYPE: same locality and collecting date as the holotype, *F. Pupulin et al.* 7309 (CR).

Lepanthes machogaffensis can be compared with the

Ecuadoran *L. glabella* Luer&Hirtz, from which it differs by the almost concolor purple flowers (vs. purple dorsal sepal and yellow lateral sepals), the sparsely ciliate (vs. entire) sepal margins, the narrowly ovate, rounded lower lobe of the petals (triangular, narrowly obtuse in *L. glabella*), and the lip provided with rheniform-subfalcate blades, uncinata at the apices (vs. oblong with rounded ends) and an external appendix (apical on the sinus in *L. glabella*).

Lepanthes mariposa Luer, *Phytologia* 55: 187. 1984.

TYPE: PANAMA. Prov. of Chiriquí: epiphytic in scrubby trees near Volcan, alt. 1350 m, 7 Dec 1983, *C. Luer, J. Luer & H. Butcher* 9278 (holotype, SEL).

Plant epiphytic, caespitose, pendulous to suberect, to 4 cm tall. **Roots** flexuous, ca. 1 mm in diameter. **Ramicaul** erect, slender, to 0.7-2.5 cm long, enclosed by 2-4 lepanthiform sheaths, the ostia short, minutely ciliate along the margins. **Leaf** elliptic, obtuse, emarginate with an abaxial apicule, conduplicate, coriaceous, 1-1.5 x 0.5-0.8 mm, the cuneate base contracted into a short petiole less than 2 mm long. **Inflorescence** a congested, distichous, successively several-flowered raceme borne above the leaf, to 3-4 mm long including the filiform peduncle to 2-3 mm long. **Floral bracts** triangular, acute, amplexant, to 1 mm long. **Pedicel** terete, to 1 mm long. **Ovary** subclavate, ca. 1 mm long, smooth. **Flowers** resupinate, spreading, with yellowish sepals, the petals yellow, basally blotched with red, the lip reddish-pink. **Dorsal sepal** elliptic, subacute to acute, 3-nerved, the margins entire, 1.6 x 1.3 mm, connate to the lateral sepals for ca. 1.5 mm. **Lateral sepals**, ovate, acute, 3-nerved, with entire margins, 1.3 x 1 mm, connate at the base for ca. 1 mm. **Petals** transversely bilobed, 1.8 x 0.7 mm, as large as sepals, the lobes subequal, the upper lobe ovate, rounded, 0.9 x 0.7 mm, the lower lobe ovate, rounded, 0.9 x 0.7 mm, ciliate. **Lip** bilaminate, 1 x 0.7 mm, the blades ovate, truncate, arching, enclosing the column, the connectives cuneate, parallel to the column in natural position, the body basally connate to the column, the appendix external, ligulate, hairy. **Column** terete, stout, to 1.5 mm long, with apical stigma and dorsal anther. **Anther cap** cucullate, 2-celled. **Pollinia** 2, pyriform, with viscidium.

ETYMOLOGY: from the Spanish *mariposa*, or "butterfly", alluding to the shape of petals that spread like the wings of a butterfly.

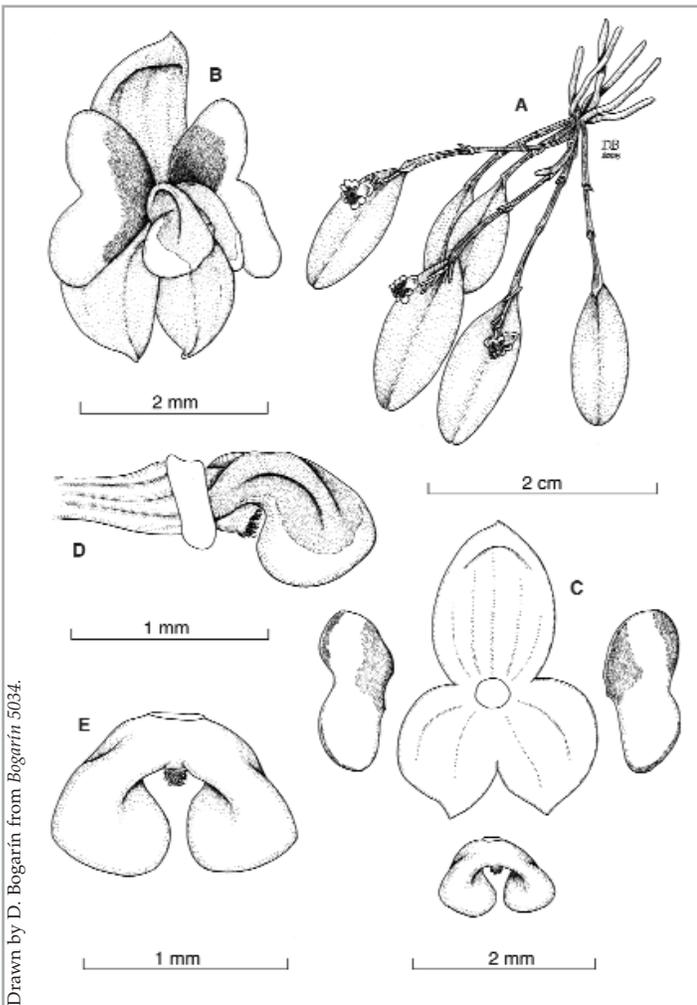
DISTRIBUTION: known only from the Talamanca mountain range of Costa Rica and Panama.

HABITAT: epiphytic in premontane wet forest at 1300-1500 m elevation.

COSTA RICAN MATERIAL STUDIED: San José: Tarrazú, San Lorenzo, ca. 4 km southeast of Santa Marta, road to Bajo Reyes, 9°36'38.2"N 84°00'52.1"W, 1475 m, premontane wet forest, epiphytic in pasture fences along the roadside, 20 Nov. 2008, *D. Bogarín* 5644, *R.L. Dressler, M. Fernández, R. Gómez & R. Trejos* (Lankester Botanical Garden-Spirit collection). Dota-Tarrazú, San Marcos, San Lorenzo, 9°36'23.7"N



Figure 9. The lateral sepals of *Lepanthes machogaffensis* can be almost completely straight. (*Pupulin* 7309).



Drawn by D. Bogarín from Bogarín 5034.

Figure 10. *Lepanthes mariposa* Luer. A: Habit. B: Flower. C: Dissected perianth. D: Ovary, column, and lip, lateral view. E: Lip, spread.



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Figure 11. Plants of *Lepanthes mariposa* are compact and floriferous (Bogarín et al. 5034).

83°59'36.5"W, 1370 m, premontane rain forest, epiphytic on "Poró" (*Erythrina* sp.) fences in exposed spots, collected by D. Jiménez, flowered in cultivation at Lankester Botanical Garden, 5 Jul. 2008, D. Bogarín 5034 (Lankester Botanical Garden-Spirit collection).

Lepanthes mariposa is similar to *L. lindleyana* Oerst. & Rchb. f. and *L. exasperata* Ames & C. Schweinf.; however, its smaller habit with ovate leaves, the inflorescences produced on short racemes on top of the leaves and the shape of petals that spread like butterfly wings to either side of the lip and column easily distinguish this species. Plants were found growing in exposed conditions on fences and roadside trees. This species is recorded here for the first time for Costa Rica.

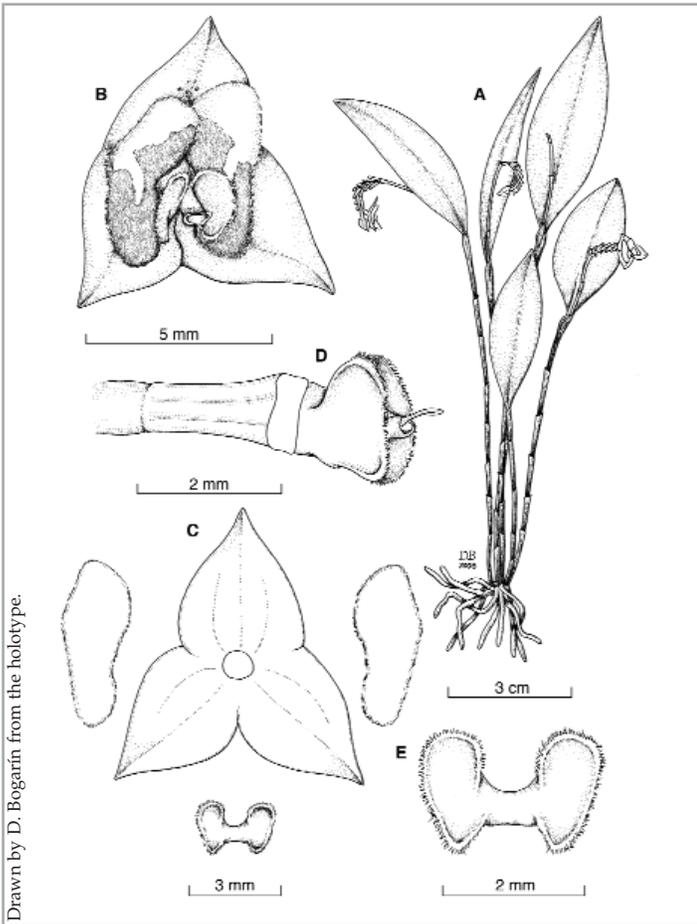
Lepanthes olmosii Bogarín, sp. nov.

TYPE: PANAMA. Chiriquí: Boquete, Bajo Chorro, Alto Chiquero, collected by Erick Olmos, without further locality data, flowered in cultivation at Finca Drácula, Cerro Punta, Guadalupe, 12 December 2006, D. Bogarín 3005 (holotype, PMA; isotypes, CR, Lankester Botanical Garden-Spirit collection).

Species Lepanthes poasensi Luer similis, inflorescentia arcuata, ovario parviore, floribus majoribus, marginibus petalorum distincte ciliatis, lobulo infero petalorum oblongo, labello majore differt.

Plant epiphytic, caespitose, to 19 cm tall. **Roots** flexuous, ca. 1 mm in diameter. **Ramical** erect, slender, to 5-11 cm long, enclosed by 5-8 tightly fitting, blackish lepanthiform sheaths, the ostia narrow, minutely ciliate along the margins. **Leaf** elliptic, acute to shortly acuminate, conduplicate, subcoriaceous, 3-7 x 1.6-2 cm, the cuneate base contracted into a short petiole less than 1 mm long. **Inflorescence** a congested, distichous, successively several-flowered raceme borne above or beneath the leaf, to 3-6.5 cm long including the filiform peduncle to 3.5 cm long, the rachis arcuate. **Floral bracts** triangular, acute, amplexent, to 1 mm long. **Pedicel** terete, to 4 mm long. **Ovary** subclavate, ca. 2 mm long, smooth. **Flowers** spreading, with yellow-orange sepals, the petals orange, stained with scarlet red, the lip orange-red. **Dorsal sepal** ovate, acute to subacuminate, 3-nerved, the margins entire, 4.8 x 4 mm, connate to the lateral sepals for ca. 1.5 mm. **Lateral sepals** subequal to the dorsal sepal, ovate, acute, 3-nerved, with entire margins, 4.8 x 4 mm, connate at the base for ca. 1 mm. **Petals** transversely bilobed, 4 x 2 mm, the upper lobe ovate, rounded-truncate, 2.5 x 2 mm, the lower lobe subrectangular, obtuse, 2 x 2 mm, ciliate. **Lip** bilaminar, 3 x 1 mm, the blades perpendicular to the column, ovate, ear-shaped, slightly carinate along the inner margins, ciliate, the apex subacute or slightly rounded, the connectives cuneate, the body basally connate to the column, the appendix external, inconspicuous, vestigial. **Column** terete, stout, to 1.5 mm long, with apical stigma and dorsal anther. **Anther cap** cucullate, 2-celled. **Pollinia** 2, pyriform, with viscidium.

PARATYPE: PANAMA. Chiriquí: Boquete, Jaramillo, Cerro La Estrella, Finca Bruña, 8°47'11.5"N 82°21'28.7"W, 2100 m, cultivated by Steve & Marjorie Sarner, N. 1438, Boquete, Panamá, 18 Dec. 2008, D.



Drawn by D. Bogarín from the holotype.

Figure 12. *Lepanthes olmosii* Bogarín. A: Habit. B: Flower. C: Dissected perianth. D: Ovary, column, and lip, lateral view. E: Lip, spread.



©F. Pupulin.

Figure 13. *Lepanthes olmosii* has large flowers with broad segments, and the margins of the petals are distinctly ciliate. Photo of flower from the plant that served as the holotype.

Bogarín 5948 (PMA; Lankester Botanical Garden-Spirit collection).

EPONYMY: dedicated to Erick Olmos of Finca Dracula, Guadalupe, Panama who discovered the first plant known of this species.

DISTRIBUTION: known only from the western Cordillera Central in Chiriquí province, Panama.

HABITAT: epiphytic in premontane rain forest at 2100 m elevation.

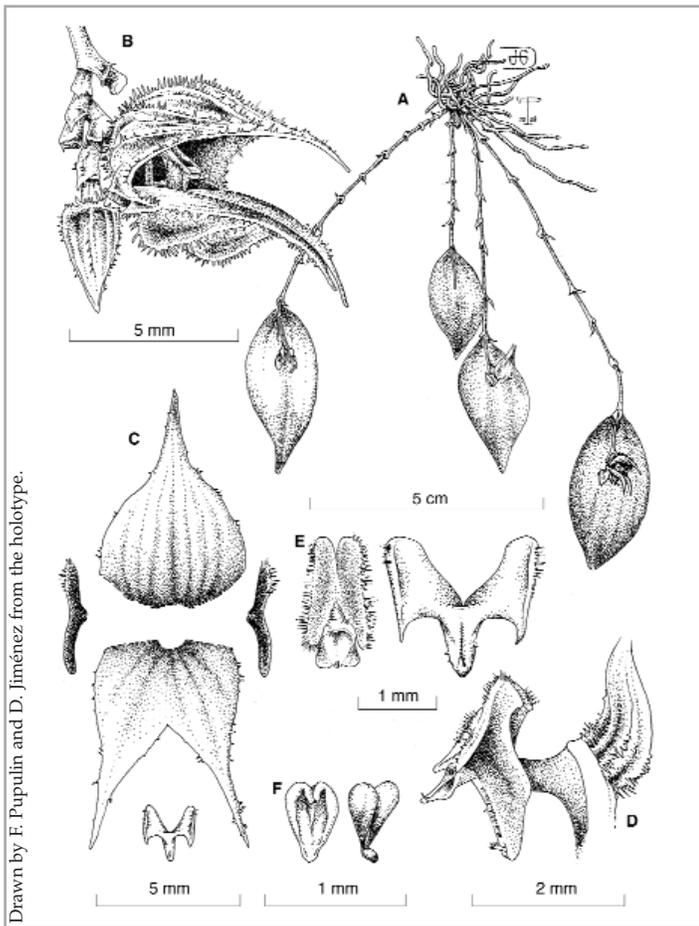
Lepanthes olmosii belongs to the *Lepanthes disticha-complex* characterized by the erect ramicauls with blackish, amplexant lepanthiform sheaths with narrow ostia and the coriaceous, ovate, acute to acuminate leaves. Although similar in habit to *L. poasensis* Luer, *L. olmosii* can be recognized by the arcuate inflorescences (unique among the *L. disticha-complex*), the smaller ovaries less than 2 mm long (up to 4 mm in *L. poasensis*), the larger flowers (less than 8 mm long in *L. poasensis*), the petals with ciliate margins and the lower lobe oblong and rounded, and the lip blades ear-shaped and perpendicular to the column. The sepals are golden colored and the petals suffused with scarlet red.

***Lepanthes pelvis* Pupulin & D. Jiménez, sp. nov.**

TYPE: COSTA RICA. Cartago: El Guarco, San Isidro, Paso Macho (Macho Gaff), after the rangers' headquarters of the Tapantí-Macizo de La Muerte National Park, basin of Río Macho, road to Queverí, 9°43'55.7" N 83°50'02.4" W, 2109 m, epiphytic in rain montane forest, 9 October 2008, F. Pupulin 7336, D. Bogarín, R. Gómez, D. Jiménez & R. Trejos (holotype, CR; isotypes, CR, Lankester Botanical Garden-Spirit collection). Figs. 14–16.

Species Lepanthes satyricae Luer similis, foliis ellipticis, ovario alato-denticulato, sepalis acuminatis costatis cristatis, lobulis petalorum subequalis apiculi destitutis, colore floribus recedit.

Plant epiphytic, caespitose, to 15 cm tall. **Roots** flexuous, ca. 1 mm in diameter, pale purple. **Ramicaul** patent to arching (rarely suberect), becoming pendent with age, slender, 3.7-9.5 cm long, enclosed by 4-9 tightly fitting, lepanthiform sheaths, the ostia dilated, ovate-acuminate, the margins provided with triangular, flattened cilia. **Leaf** elliptic to elliptic-lanceolate, acute to shortly acuminate, apically minutely bilobed, abaxially mucronate, subcoriaceous, 2.5-6 x 1.2-2.5 cm, the rounded base contracted into an inconspicuous petiole. **Inflorescence** a congested, distichous, successively few-flowered raceme borne above the leaf, to 15 mm long including the filiform peduncle 6-10 long. **Floral bracts** triangular-ovate, acute, amplexant, to 1.5 mm long. **Pedice** terete, to 2 mm long. **Ovary** clavate, ca. 2 mm long, the apical portion winged, provided with glandular hairs along the carpels' divisions. **Flowers** resupinate, ringent, the sepals yellow, tinged purple between nerves, the petals red, the lip orange, tinged with dark red. **Dorsal sepal** broadly ovate, acuminate, 7-nerved, deeply concave, the margins sparsely cellular-cili-



Drawn by F. Pupulin and D. Jiménez from the holotype.

Figure 14. *Lepanthes pelvis* Pupulin & D. Jiménez. A: Habit. B: Flower. C: Dissected perianth. D: Ovary, column, and lip, lateral view. E: Lip, in natural position and spread. F: Anther cap and pollinarium.

ate, abaxially costate, provided with dense tufts of trichomes along the nerves, 7.5 x 5 mm, connate to the lateral sepals for ca. 2.5 mm. **Lateral sepals** ovate, acuminate, 3-nerved, the margins sparsely ciliate, abaxially costate, ciliate along the nerves, 7.5 x 3 mm, connate at the base for ca. 2.5 mm. **Petals** transversely bilobed, 0.5 x 4 mm, the lobes subequal, linear, rounded, the upper lobe ovate, rounded-truncate, provided with long cilia along the outer margin, the lower lobe subfalcate. **Lip** bilaminate, 2 x 2 mm, the blades narrowly elliptic-lanceolate, erect, slightly carinate along the apex of the inner margins, abaxially ciliate, the apex acute-subfalcate, the connectives broadly cuneate, the body basally connate to the column, thick, conic, with a central groove, the appendix inconspicuous, hirsute. **Column** terete, slender, 2.2 mm long, with apical stigma and dorsal anther. **Anther cap** cucullate, triangular-ovate, 2-celled. **Pollinia** 2, pyriform, with viscidium.

ETYMOLOGY: from the Latin “*pelvis*”, the bony structure located at the base of the spine, in allusion to the pelvis-shaped lip when flattened.

DISTRIBUTION: known only from the Caribbean drainage of the Talamanca mountain range of Costa Rica.

HABITAT: epiphytic in montane wet forests at 2100 m elevation, where it forms large populations.

PARATYPES: same locality and collecting date as the holotype, *D. Bogarín et al.* 5273 (JBL-Spirit); *F. Pupulin et al.* 7338 (Lankester Botanical Garden-Spirit collection); *F. Pupulin et al.* 7340 (Lankester Botanical Garden-Spirit collection); *F. Pupulin et al.* 7341 (Lankester Botanical Garden-Spirit collection).

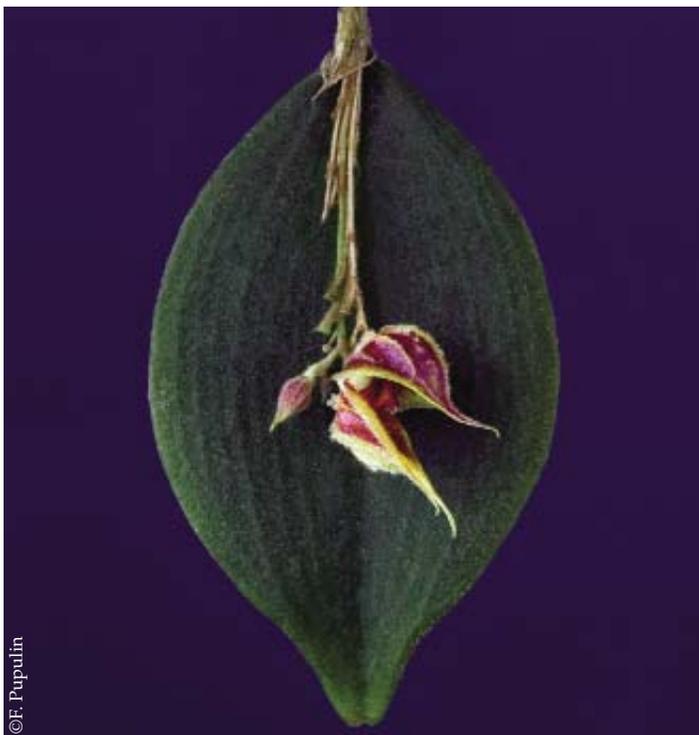


Figure 15. *Lepanthes pelvis* is unusual among species from Mesoamerica in the comparatively large, ringent flower (Pupulin 7336).



Figure 16. The sepals of *Lepanthes pelvis* are dorsally costate-cristate, and the long connectives of the lip bear the blades high over the column. Photo of flower from the plant that served as the holotype.

Lepanthes pelvis has no close relatives in Costa Rica and Central America. Its affinities are with mainly Andean species, among which are *L. cassidea* Rchb.f., *L. elephantina* Luer & Escobar, *L. flexuosa* Luer, and *L. satyrica* Luer, characterized by a deeply concave dorsal sepal and somewhat ringent flowers. It is most similar to *L. satyrica*, with which it shares the short inflorescence borne on top of the leaf and the general structure of the lip, with long connectives that bear the narrow blades well above the column, and the long process that descends from the body, with an apical appendix. However, *L. pelvis* may be distinguished from *L. satyrica* by the green, elliptic leaves, broader than 1.2 cm (vs. purple-striped, very narrowly ovate, up to 5 mm wide), the winged, denticulate ovary (vs. round, glabrous), the acuminate sepals (vs. obtuse, the lateral sepals connate into a shortly bifid synsepal), distinctly costate and cristate-ciliate along the nerves (vs. glabrous), and the petals with subequal lobes (vs. the lower lobe longer, narrowly linear-triangular) and without an apiculum on the margin between the lobes (present in *L. satyrica*). *

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