

ILLUSTRATIONS AND STUDIES IN NEOTROPICAL ORCHIDACEAE. 5.  
THE *LEPANTHES OVALIS* GROUP (PLEUROTHALLIDINAE)  
WITH THREE NEW SPECIES FROM COSTA RICA

<sup>1</sup>Diego Bogarín

*Jardín Botánico Lankester  
Universidad de Costa Rica  
P.O. Box 302-7050  
Cartago, COSTA RICA, A.C.  
diego.bogarín@ucr.ac.cr*

Christina M. Smith

*Jardín Botánico Lankester  
Universidad de Costa Rica  
P.O. Box 302-7050  
Cartago, COSTA RICA, A.C.  
christina.smith@ucr.ac.cr*

Daniel Jiménez

*Jardín Botánico Lankester  
Universidad de Costa Rica  
P.O. Box 302-7050  
Cartago, COSTA RICA, A.C.  
admin@tools.co.cr*

ABSTRACT

We revise and characterize the group of species close to *Lepanthes ovalis*. Three new species from Costa Rica are described and illustrated. ***Lepanthes dikoensis*** Bogarín & C.M. Sm., sp. nov. is similar to *L. viridis* but differs mainly by the smaller leaves (to 4 cm long) and smaller flowers (to 6.5 mm in diameter), the glabrous petals with the lower lobe ovate, falcate, shorter than the lobes of the lip, both lobes yellow with red-orange and scarlet, the lip scarlet, apically yellowish and the appendix oblong. ***Lepanthes expansilabia*** Bogarín & C.M. Sm., sp. nov. is similar to *L. erinacea* but differs by the pendent plants, the petals with the lobes oblong, subsimilar, the lower lobe yellow, the lip spreading with the lobes separated and not touching each other, leaving the appendix exposed. ***Lepanthes tarrazuensis*** Bogarín & D. Jiménez, sp. nov. is similar to *L. seegeri* but differs in the glabrous petals, the lip glabrous with ciliate apices, the upper lobe of petals truncate, without lobules at the inner apical corner, the petals and lip basally red, tinged with yellow-orange at apex, the blades of the lip touching each other above the column and the appendix shorter, not extending far from the column. An illustration of *L. erinacea*, a key to the species of the group and a table summarizing the differences between the Costa Rican taxa are provided.

RESUMEN

Revisamos y caracterizamos el grupo de especies cercanas a *Lepanthes ovalis*. Se describen e ilustran tres especies nuevas de Costa Rica. ***Lepanthes dikoensis*** es similar a *L. viridis*, pero se diferencia principalmente por las hojas más pequeñas (hasta 4 cm de largo) y flores más pequeñas (hasta 6,5 mm de diámetro), los pétalos glabros con el lóbulo inferior ovado, falcado, más corto que los lóbulos del labelo, ambos lóbulos de color amarillo con rojo-anaranjado y escarlata, el labelo escarlata, apicalmente amarillento y el apéndice oblongo. ***Lepanthes expansilabia*** es similar a *L. erinacea* pero se diferencia por las plantas péndulas, los pétalos con los lóbulos oblongos, subsimilares, el lóbulo inferior de color amarillo, el labelo expandido y con los lóbulos separados que no se tocan entre sí, dejando el apéndice expuesto. ***Lepanthes tarrazuensis*** es similar a *L. seegeri* pero difiere en los pétalos y el labelo glabros con los ápices ciliados, el lóbulo superior de los pétalos truncados, sin lóbulos en la esquina interior apical, los pétalos y el labelo basalmente rojos, teñidos de color amarillo-anaranjado en el ápice, las láminas del labelo tocándose entre sí por encima de la columna y el apéndice más corto, que no se extiende lejos de la columna. Se proporciona una clave para las especies del grupo, una ilustración de *L. erinacea* y una tabla que resume las diferencias entre los taxones de Costa Rica.

With about 120 species currently recognized, *Lepanthes* Sw. is one of the most diverse genera of the Pleurothallidinae in Costa Rica (Bogarín & Fernández 2010). As discussed in previous works, the large number of species, their morphological variation and the continuous discovery of new species in less explored areas, have led us to treat the genus in taxonomic informal groups or alliances. In order to complete the taxonomic revision of *Lepanthes* in Costa Rica, we treated preliminarily the following groups: *Lepanthes jimenezii* Schltr. (Pupulin &

<sup>1</sup>Herbario UCH, Universidad Autónoma de Chiriquí, P.O. Box 0427, David, Chiriquí, Panama Centro de Investigación en Orquídeas de los Andes "Ángel Andreetta," Universidad Alfredo Pérez Guerrero, Ecuador

Bogarín 2010); *L. schizocardia* Luer (Pupulin et al. 2010). Two other groups are under review: *L. guatemalensis* Schltr. (Pupulin & Bogarín in prep.) and *L. minutilabia* Ames & C. Schweinf. (Smith et al. in prep.).

In this paper, we studied a group of species related to the Jamaican endemic *Lepanthes ovalis* (Sw.) Fawc. & Rendle, the first species of *Lepanthes* to be described and which was originally placed in *Epidendrum* L. (Swartz 1788). The other species of this group are *L. erinacea* Rchb.f., one of the first species described in Costa Rica (Reichenbach 1855), *L. pan* Luer & Dalström from Ecuador (Luer 1996), *L. seegeri* Luer from Panama (Luer 1987), *L. trichocaulis* Luer & R. Escobar (Luer 1988) and *L. viridis* Pupulin & Bogarín, recently published from Costa Rica (Pupulin & Bogarín 2011). All members share similar plant morphology, having ramicauls with long-ciliate sheaths with markedly dilated, long-ciliate ostia. The leaves are subcoriaceous, always light green without purple stripes or spots. The congested racemes arise under or above the leaves and are shorter than the leaves (rarely larger in some specimens of *L. erinacea*). The sepals are ovate, acute to obtuse, pubescent or glabrous. The upper lobes of the petals are wider and longer than the lower lobes. The lip is triangular, cordate or subcordate, with the sides strongly folded and embracing the column at sides (rarely expanded), the blades are flattened with cuneate connectives, the apex is cleft leaving a narrow space between the apices with a pubescent appendix (Luer 1987; Luer 1996; Pupulin & Bogarín 2011). At the moment the group range includes Costa Rica, Panama, Colombia, Ecuador and Jamaica. We add three species proposed here as new to science. A key to the species of the group is provided. Additional material is provided online at [www.epidendra.org](http://www.epidendra.org)

**1. *Lepanthes dikoensis*** Bogarín & C.M. Sm., sp. nov. (Figs. 1A, 2). TYPE: COSTA RICA. CARTAGO. Jiménez: Pejibaye, Tausito, El Copal Biological Reserve, along Tigre, Mariposa and Gárvula trails, 9°47'02.7"N 83°45'04.3"W, 1020 m, premontane wet forest, epiphytic in secondary forest 18 Jun 2005, *D. Bogarín et al.* 1625 (HOLOTYPE: JBL).

*A Lepanthes viridis* Pupulin & Bogarín, foliis brevioribus, floribus in diametro brevioribus, petalis glabris, scarlatis-flavis, lobo inferiore ovato falcato, labello scarlato in apice flavo, lobulis labelli quam lobo inferiore petalorum longioribus et appendice oblonga et a *Lepanthes ovalis* (Sw.) Fawc. & Rendle, stirpe pendente, foliis brevioribus, ostiis vaginarum ciliatis, floribus minoribus, petalis glabris, scarlatis-flavis, lobulo inferiore petalorum lunato, falcato, sepalis aurantiacis, appendice longiora statim dignoscenda.

**Plant** epiphytic, caespitose, pendent herb, up to 15 cm long. **Roots** slender, flexuous, up to 1 mm in diameter. **Ramicaul** more or less descending, up to 10.5 cm, enclosed by 11–21 ciliate, lepanthiform sheaths, lightly ciliate especially on new growth; the ostia markedly dilated, ciliate. **Leaves** coriaceous, green, elliptic, subobovate, acuminate with a short apiculus, 3.0–4.0 × 1.0–1.5 cm; cuneate base narrowing into a petiole ca. 3.5 mm long. **Inflorescence** racemose, distichous, successively flowered, borne above the leaf, shorter than the leaves, up to 3 cm, peduncle 1.5–2 cm long, rachis 0.5–1.0 cm. **Floral bracts** 1 mm long, ciliate. **Pedicel** 1.5 mm long, persistent. **Ovary** up to 1 mm long. **Flowers** light orange, yellow, red-orange and scarlet; sepals light orange; petals yellow with red-orange and scarlet; lip scarlet; column red. **Dorsal sepal** ovate, acute, connate to the lateral sepal for about 1 mm, 3.2 × 2.9 mm. **Lateral sepals** ovate to elliptic, acute, connate for about 1 mm, 2.5 × 2.5 mm. **Petals** essentially glabrous, transversely bilobed, entire, 0.8 × 2.4 mm; the upper lobes broadly uncinatate, rounded, overlapping, the apex broadly rounded; the lower lobes ovate, falcate, with apex broadly rounded, slightly smaller than the upper lobes. **Lip** bilaminatate, adnate to the column, 1.8 × 1.3 mm expanded; blades narrowly oblong, pubescent, with narrowly rounded ends, falcate; connectives broadly cuneate, up to 1 mm long, perpendicular to the column and not leaving it exposed; body broadly oblong, connate to the base of the column; appendix narrowly oblong, pubescent. **Column** cylindrical, 1 mm long; anther apical; stigma ventral. **Pollinia** two, ovoid. **Anther cap** cucullate.

Representative specimens: **COSTA RICA. Cartago. Jiménez:** Pejibaye, between Tausito and Selva, around El Copal Biological Reserve, shores of Taus river and Quebrada Selva, 9°47'5.22"N 83°45'46.1"W, 1197 m, premontane wet forest, epiphytic in secondary forest, 1 May 2008, *D. Bogarín et al.* 4768 (CR); same locality, *D. Bogarín et al.* 4793 (JBL); Selva, El Copal Biological Reserve, 9°47'00"N 83° 45'20" W, 1000–1200 m, 2 Jun 2001, *M. Blanco & R. Narit* 1924 (CR); Taus, elev. aprox. 1000 m, 10 Nov 1984, *R.L. Dressler et al.* 155 (USJ).

**Distribution.**—Only known from Costa Rica.

**Habitat and ecology.**—Epiphyte in secondary premontane wet forest on the Atlantic watershed of Cordillera de Talamanca, between 1000 and 1200 m of elevation.

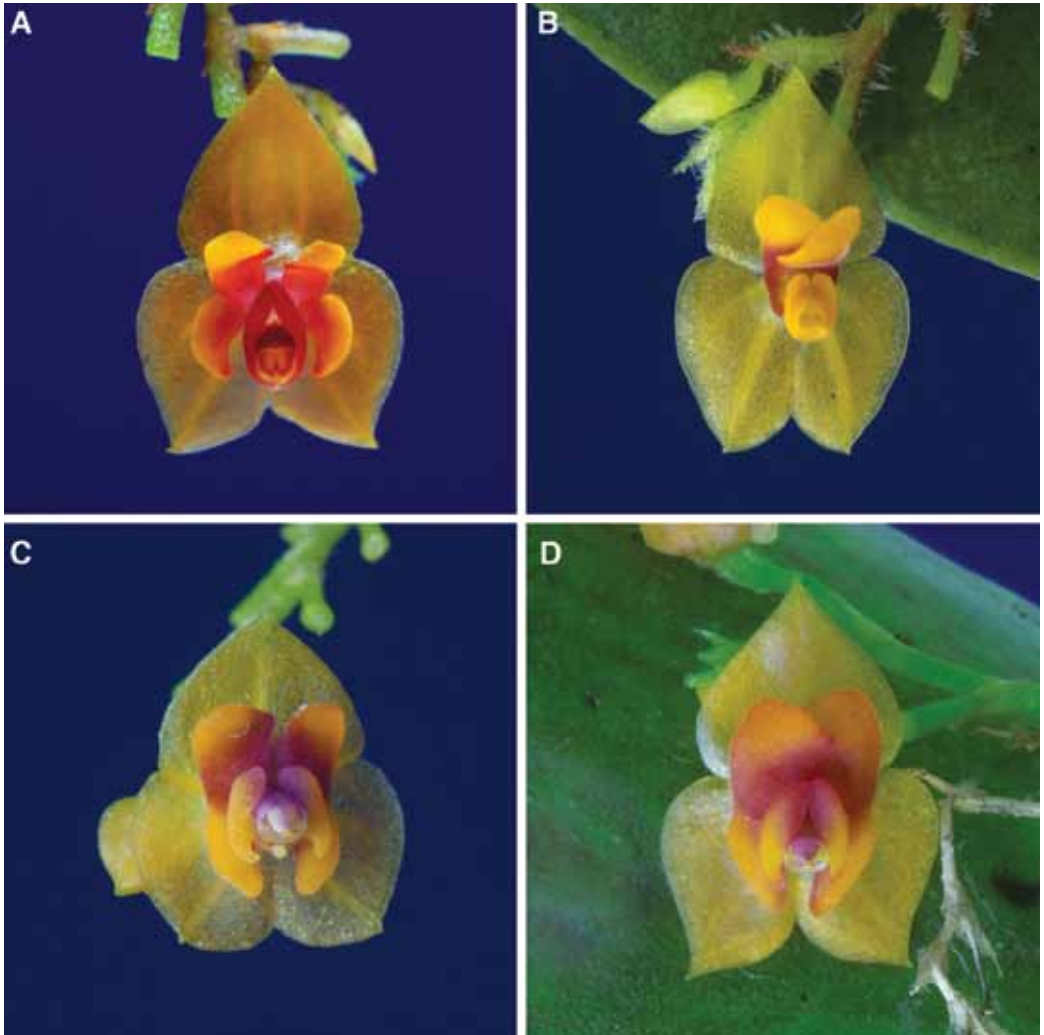


FIG. 1. Floral morphology of species of the *L. ovalis* group in Costa Rica. A) *L. dikoensis*. B) *L. erinacea*. C) *L. expansilabia*. D) *L. tarrazuensis*.

*Etymology*.—From the Costa Rican indigenous language Bribri *Dikö* and the Cabécar *Diká*, “pejibaye” or “peach-palm” (*Bactris gasipaes* Kunth), after the name of the district of Pejibaye de Jiménez, Cartago, where all the specimens of this *Lepanthes* were collected.

*Phenology*.—Plants have been recorded in flower from June to November.

*Discussion*.—It is similar to *L. viridis* but differs in the smaller leaves up to 4 cm long (vs. longer, to 6 cm long), smaller flowers to 5.7 mm in diameter (vs. to 12 mm), petals glabrous-minutely pubescent (vs. ciliate-hispid), the lower lobe ovate, falcate, shorter than the lobes of the lip (vs. lanceolate, subfalcate, as long as the lobes of the lip), both lobes yellow with red-orange and scarlet (vs. green with red at base) the lip scarlet, apically yellowish (vs. green with dark red at the base of each lobe), the appendix oblong (vs. rounded). It is also similar to *L. ovalis* but differs in the pendent plants (vs. erect to suberect), smaller mature leaves 4 × 1.5 cm (vs. 6 × 2.3 cm), ramicauls with ciliate sheaths and ostia (vs. minutely ciliate-scabrous), the petals glabrous (vs. the upper lobe glabrous, the lower minutely pubescent), the upper lobe oblong, apically rounded (vs. suborbicular),

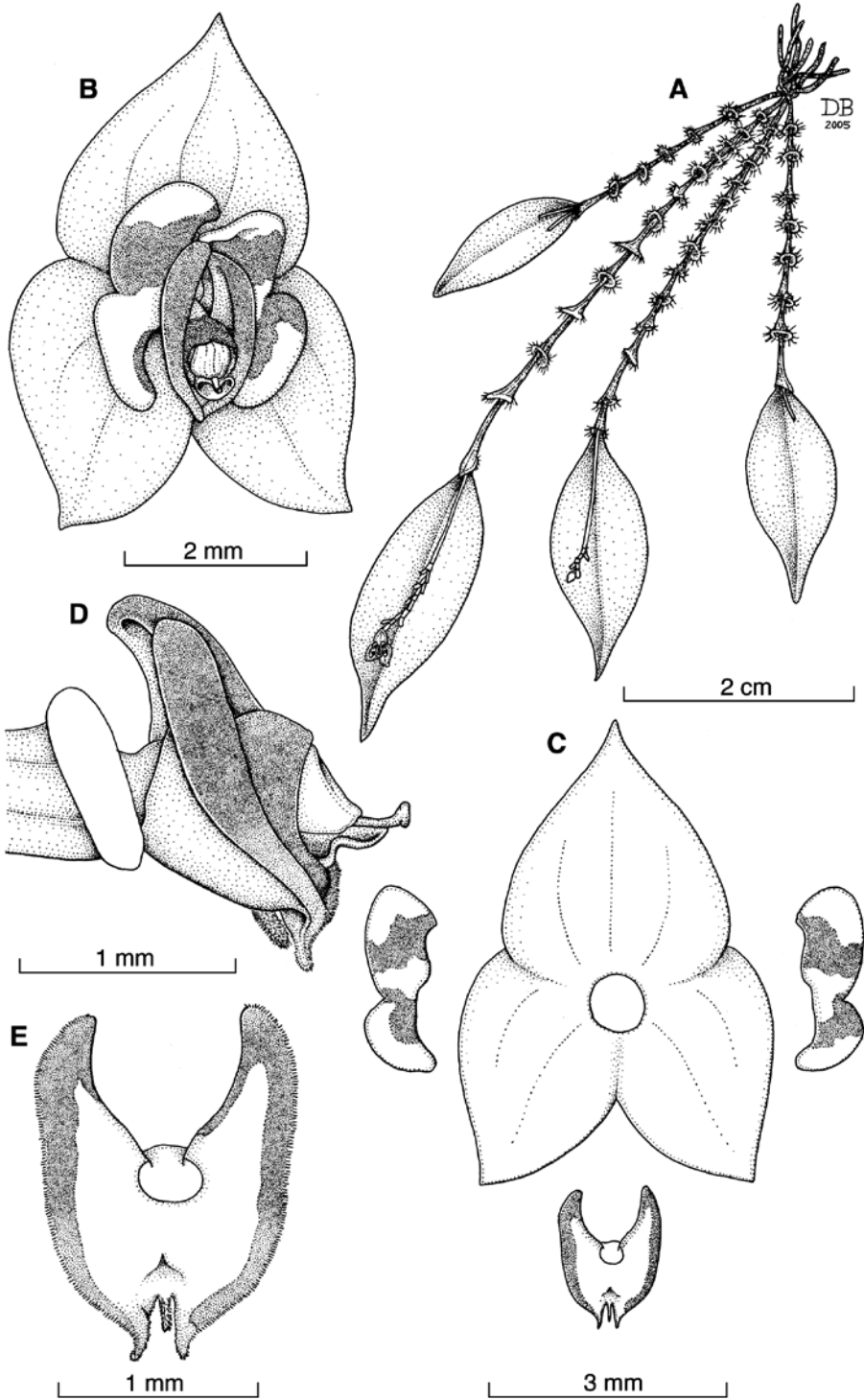


FIG. 2. *Lepanthes dikoensis* Bogarín & C.M. Sm. A) Habit. B) Flower. C) Dissected perianth. D) Column and lip, lateral view. E) Lip, spread. Drawn by D. Bogarín from the holotype (JBL-Spirit).

lower lobe of the petals lunate, strongly falcate (vs. narrowly triangular, subfalcate), the color of flowers, the sepals orange (vs. yellow), the lower lobe of petals basally scarlet with the apex yellow-orange (vs. yellow-orange, without the scarlet stain), and the appendix narrowly oblong (vs. a small, rounded lobule) (Fig.1). The differences between Costa Rican taxa are summarized in Table 1.

**2. *Lepanthes erinacea*** Rchb.f., *Bonplandia* (Hanover) 3(15–16):225. 1855. (Figs. 1B, 3). TYPE: COSTA RICA. [CARTAGO. Turrialba]: Turrialva in Costarica, A. Oersted s.n. (HOLOTYPE: W).

*Lepanthes apiculifera* Schltr., Repert. Spec. Nov. Regni Veg. Beih.19:177. 1923. TYPE: COSTA RICA. [ALAJUELA]: Bois humides, San Pedro de San Ramón, alt. 1100 m, Jul 1921, A.M. Brenes 72 (HOLOTYPE: B, destroyed; lectotype designated by Barringer, Fieldiana, Bot., n.s., 17:8. 1986, AMES, drawings of type, AMES).

*Lepanthes endresii* Luer, Lindleyana 7:106. 1992. TYPE: COSTA RICA. CARTAGO: heights above El Tejar south of Cartago, Jun, ca. 1867, A.R. Endres 509 (HOLOTYPE: W).

*Lepanthes wercklei* Schltr., Repert. Spec. Nov. Regni Veg. 10(257–259):396. 1912. TYPE: COSTA RICA. [CARTAGO]: Bei Pacugao [Pacayas], c. 2000 m, blühend im Mai 1901, K. Wercklé 16173 (HOLOTYPE: B, destroyed; LECTOTYPE designated by Pupulin, Bot. J. Linnean Soc. 163:137. 2010, US-578037, digital photograph; drawing of type, AMES-100728)

**Plant** epiphytic, caespitose, erect to suberect herb, up to 15 cm tall. **Roots** slender, flexuous, up to 1 mm in diameter. **Ramical** erect to suberect, up to 10.5 cm long; enclosed by 9–14 heavily ciliate, lepanthiform sheaths, the ostia markedly dilated, heavily ciliate. **Leaves** coriaceous, green, ovate to orbicular, slightly conduplicate, emarginated, subacuminate with a short apiculus, 2.5–5.0 × 1.0–2.3 cm; the rounded base narrowing into a petiole to 3 mm long. **Inflorescence** racemose, distichous, successively flowered, borne below the leaf, can be longer than the leaves, up to 4.5 cm; peduncle 1.2–1.4 cm long; rachis 0.8–3.2 cm. **Floral bracts** 1 mm long, ciliate. **Pedicel** 1.5–2.0 mm long, persistent. **Ovary** up to 2 mm long. **Flowers** yellow with red-orange; the sepals yellow, petals yellow with red-orange, lip yellow and lightly tinged with orange, column yellow. **Dorsal sepal** ovate, acute, connate to the lateral sepal for about 1 mm, 3.0 × 2.5 mm. **Lateral sepals** ovate to elliptic, acute, connate for about 1 mm, 2.5–3.0 × 2.5–3.0 mm. **Petals** minutely pubescent, transversely bilobed, entire, 1.5 × 2.0 mm; upper lobes with shortly ciliate margins, flabellate, overlapping, apex broadly rounded, with an obtuse angle in the inner margin; lower lobes oblong, oblique, much smaller than the upper lobes. **Lip** bilaminate, adnate to the column, 1.4 × 1.3 mm expanded; blades ovate, falcate, pubescent, with rounded ends, connectives broadly cuneate, up to 1 mm long, perpendicular to the column and not leaving it exposed; body oblong, connate to the base of the column; appendix oblong, pedunculate, pubescent. **Column** cylindrical, 1 mm long; anther apical; stigma ventral. **Pollinia** two, ovoid. **Anther cap** cucullate.

*Distribution*.—Only known from Costa Rica.

*Phenology*.—Plants were recorded in flower from June to December.

*Habitat and ecology*.—Growing as an epiphyte in primary and secondary premontane wet forest, between 1000 and 1500 m of elevation mostly along the Cordillera Volcánica Central and Cordillera de Talamanca.

*Discussion*.—It is distinguished by the erect plants with ramicauls with long ciliate sheaths, the yellow sepals and column and the red petals with the apex orange-red. The most important feature is the upper lobe of the petals, which is flabellate with the broadly rounded apices overlapping, and the oblong, oblique lower lobes, much smaller than the upper lobes and shorter than the blades of the lip. The blades of the lip are widened basally and the appendix is oblong and pubescent (Fig.1). Table 1 summarizes other differences between the Costa Rican taxa belonging to this group.

The species was described three additional times as *Lepanthes apiculifera* Schltr. (Schlechter 1923), *L. endresii* Luer (Luer 1992), and *L. wercklei* Schltr. (Schlechter 1912). However, the unmistakable shape of the petals in the type material of the latter three species matches the drawing and description presented for *L. erinacea* (Reichenbach 1855). The illustration published in *Xenia Orchidacea* 1: Tab. 49 (Reichenbach 1858) is somewhat schematic but shows a plant with stiff ramicauls with long ciliate sheaths and several inflorescences developed from below the leaf. The depicted flower had widened upper lobes of the petals and the lip was spread, hiding the tiny lower lobes of the petals.

Representative specimens: **COSTA RICA. Cartago**: Zona Protectora La Carpintera Cordillera Central, primary and secondary forest near the summit of the hill, 09°53'31"N 83°58'12"W, 1500 m, epiphytic, 30 Jun 1995, J.F. Morales 4723 (INB); Paraíso, Orosi, Muñeco de Navarro,

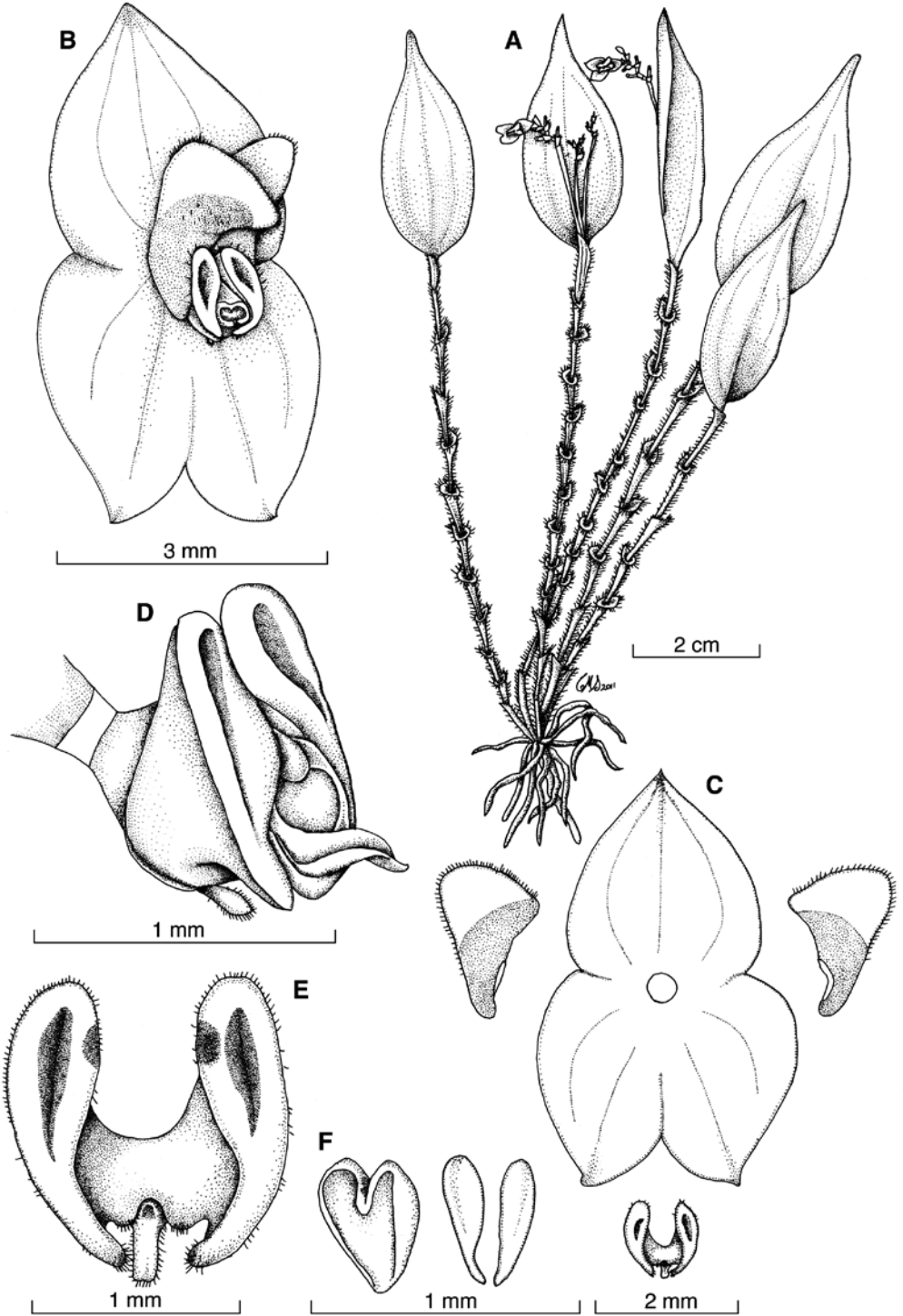


FIG. 3. *Lepanthes erinacea* Rchb.f. A) Habit. B) Flower. C) Dissected perianth. D) Column and lip, lateral view. E) Lip, spread. F) Pollinarium anther cap. Drawn by C.M. Smith from *F. Pupulin* 7477 (JBL-Spirit).

TABLE 1. Comparison of the species of *L. ovalis* group in Costa Rica.

Character	<i>L. erinacea</i>	<i>L. expansilabia</i>	<i>L. dikoensis</i>	<i>L. tarrazuensis</i>	<i>L. viridis</i>
Habit	Erect to suberect	pendent	pendent	erect	pendent
Ramicaul sheaths	heavily ciliate	lightly ciliate especially on new	lightly ciliate especially on new growth	heavily ciliate growth	heavily ciliate
Ostia	heavily ciliate	less ciliate than <i>L. erinacea</i>	less ciliate than <i>L. erinacea</i>	heavily ciliate	heavily ciliate
Leaves	ovate to orbicular, subacuminate, rounded base	elliptic, subobovate, acuminate, cuneate base	elliptic, subobovate, acuminate, cuneate base	elliptic to oblong, acute to acuminate, cuneate base	oblanceolate to obovate, acuminate, cuneate base
Inflorescence	borne below the leaf, can be longer than the leaves	borne above or behind the leaf, shorter than the leaves	borne above the leaf, shorter than the leaves	borne below (rarely above) the leaf, shorter than the leaves	borne above the leaf, shorter than the leaves
Sepal color	yellow	yellowish	light orange	light orange	orange-yellow
Petal color	yellow with red-orange	lower lobe yellow upper red-orange and scarlet	both lobes yellow with red-orange and scarlet	scarlet red with orange apices	green with red at base
Lower petal lobe	oblong, oblique, much smaller than the upper lobes	oblong, subfalcate, obtuse, slightly smaller than the upper lobes	ovate, falcate, rounded, slightly smaller than the upper lobes	oblong to narrowly triangular, smaller than the upper lobes	lanceolate, subfalcate, obtuse, slightly smaller than the upper lobes
Lip color	yellow, lightly tinged with orange	yellow with the bases of lobes lavender	scarlet, apically yellowish	orange tinged with scarlet red at bases	green with dark red at the base of each lobe
Lip blades	ovate, widened basally and touching each other	ovate, slightly widened basally and not touching each other	narrowly oblong and touching each other	ovate, widened and touching each other basally	subfalcate-lanceolate, apices approximate
Column color	yellow	purplish-lavender	red	purplish-pinkish	dark red

1300 m, 12 Apr 1998, *M. Blanco 824 & L. G. Espinoza* (USJ); Paraíso, Cachí, Peñas Blancas, 9°49'51.3"N 83°46'13.1"W, 1400 m, premontane wet forest, epiphytic on trees in pastures and secondary mature vegetation, 13 Nov 2008, *F. Pupulin et al. 7477* (JBL). **Heredia**: near Varablanca, 5 Dec 1984, *R.L. Dressler et al. 256* (USJ).

**3. *Lepanthes expansilabia*** Bogarín & C.M. Sm., sp. nov. (Figs. 1C, 4). TYPE: COSTA RICA. PUNTARENAS: COTO BRUS, Limoncito, Unión, ca. 800 m, invenit William Chacón, flowered in cultivation at Orquidario Happy Garden, 20 Apr 2011, *D. Bogarín 8766* (HOLOTYPE: JBL; ISOTYPE: CR).

Habitu *Lepanthes erinaceae* Rchb.f. et affinis similis praecipue differt stirpe pendente, ramicaulis vaginis cum ostiis minute ciliatis, lobulis petalorum oblongis subsimilaribus, lobo inferiore flavo, labello expanso lobulis separatis et appendice exposita.

**Plants** epiphytic, caespitose, pendent herb, up to 11 cm long. **Roots** slender, flexuous, up to 1 mm in diameter. **Ramicauls** more or less descending, up to 7 cm; enclosed by 6–12 ciliate, lepanthiform sheaths, lightly ciliate especially on new growth, the ostia markedly dilated, ciliate. **Leaves** coriaceous, green, elliptic, subobovate, acuminate with a short apiculus, 2.5–4.3 × 1.7–2.2 cm; the cuneate base narrowing into a petiole ca. 3 mm long. **Inflorescence** racemose, distichous, successively flowered, borne above or behind the leaf, shorter than the leaves, up to 2 cm; peduncle 1.7 cm long; rachis 4–5 mm. **Floral bracts** 1 mm long, lightly ciliate. **Pedicel** 1.5 mm long, persistent. **Ovary** up to 1 mm long. **Flowers** yellow, orange, red and purple; sepals light yellow, petals yellow with the upper lobe stained with scarlet, the lip yellow, basally lavender, the column lavender at

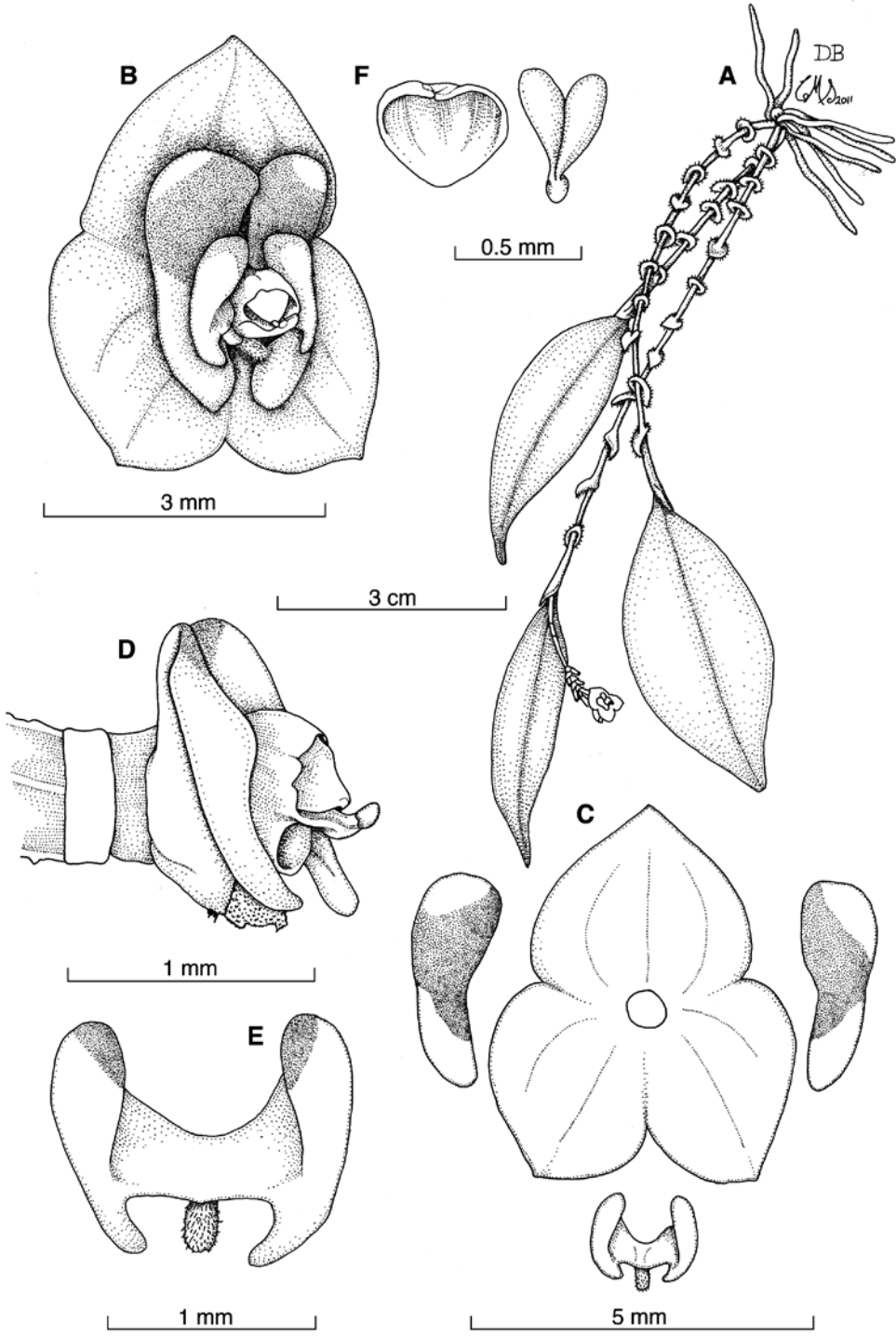


FIG. 4. *Lepanthes expansilabia* Bogarín & C.M. Sm. A) Habit. B) Flower. C) Dissected perianth. D) Column and lip, lateral view. E) Lip, spread. F) Pollinarium anther cap. Drawn by D. Bogarín and C. Smith from the holotype (JBL-Spirit).



apex. **Dorsal sepal** broadly ovate, obtuse or subacute, connate to the lateral sepal for about 1.3 mm, 3.3 mm × 2.8 mm. **Lateral sepals** ovate to elliptic, obtuse, connate for about 1.4 mm, 2.9 mm × 2.7 mm. **Petals** minutely pubescent, transversely bilobed, entire, 1.2 × 3.2 mm; the upper lobes oblong-obovate, truncate, not overlapping, the apex broadly rounded; the lower lobes oblong, obtuse, subfalcate, the apex broadly rounded, smaller than the upper lobes. **Lip** bilobate, spreading, adnate to the column, 1.2 mm × 1.5 mm, expanded; the blades ovate, with rounded ends, falcate; the connectives cuneate, up to 0.5 mm long, perpendicular to the column leaving the appendix exposed; the body oblong, connate to the base of the column; the appendix oblong, pubescent. **Column** cylindrical, 1 mm long; the anther apical; the stigma ventral. **Pollinia** two, ovoid. **Anther cap** cucullate.

*Distribution*.—Only known from the southern Pacific region of Costa Rica.

*Habitat and ecology*.—Epiphytic in tropical wet forest, premontane belt transition at 800 m of elevation along the Pacific watershed of Cordillera de Talamanca in southern Costa Rica.

*Etymology*.—From the Latin *expansus* “spread” and *labium* “lip,” in reference to the spreading lip with the lobes not touching each other, leaving the appendix exposed.

*Phenology*.—Plants have been recorded in flower in April.

*Discussion*.—It is similar to *L. erinacea* but differs mainly by the pendent plants (vs. erect) with ramicauls with sparsely ciliate sheaths (vs. heavily ciliate), the petals with the lobes oblong, subsimilar (vs. the upper flabellate, the lower minute, oblique), the lower lobe yellow (vs. red), the lip spreading with the lobes separated and not touching each other, leaving the appendix exposed (vs. the apices of the blades approximate, hiding the appendix) (Fig. 1). Other differences are summarized in Table 1.

**4. *Lepanthes ovalis*** (Sw.) Fawc. & Rendle, Fl. Jamaica 1:71. 1910. *Epidendrum ovale* Sw., Prod. 125. 1788. *Lepanthes concinna* Sw., Nova Acta Regiae Soc. Sci. Upsal. 6:85. 1799; emend. in Fl. Ind. Occ. 1557–1558. 1806, nom. illeg. *Epidendrum concinnum* (Sw.) Steud., Nomen. Bot. ed. 1:299. 1821. TYPE: JAMAICA: “Habitat in Montibus altis caeruleis Jamaicae, parasitica arborum,” O. Swartz s.n. (HOLOTYPE: not located; ISOTYPES: BM, K, S, W).

*Lepanthes crassifolia* Rchb.f., Linnaea 41:47. 1877. TYPE: JAMAICA: Vivam vidi in horto Kewensi, Sep 1873, concedente ill. Oliver. ex Jamaica missa dicebatur a hortulanis (HOLOTYPE: W).

As noted by Pupulin (2009), there is no way to assume that any of the specimens at BM is the holotype. The species should be lectotypified after a more detailed study of the available material; drawing of type, W). For a complete description and illustration see Luer (2009).

*Distribution*.—Only known from Jamaica.

*Habitat and ecology*.—Epiphytic in cloud forest along the Blue Mountains.

*Discussion*.—Plants are recognized by the erect to suberect arching habit, the inflorescences developed above the leaf, the upper lobe of petals suborbicular, rounded, yellow with red-purple base, the lower lobe yellow, pubescent and the inconspicuous appendix.

**5. *Lepanthes pan*** Luer & Dalström, Monogr. Syst. Bot. Missouri Bot. Gard. 61:133–134, f. 178. 1996. TYPE: EC-UADOR. IMBABURA: Los Cedros Reserve, wet forest near Rio Los Cedros, alt. 1200–1300 m, 24 Mar 1996, S. Dalström, S. Ingram & K. Ingram-Ferrell 2200 (HOLOTYPE: MO). For a complete description and illustration see Luer (1996).

*Distribution*.—Only known from Ecuador.

*Habitat and ecology*.—Epiphytic in wet forest at around 1200–1300 m of elevation.

*Discussion*.—It is distinguished by the erect plants with inflorescences developed behind the leaf, the lateral sepals acute, pubescent, the upper lobe of petals with a lobule at the inner apical corner, the lower lobe long-ciliate, pubescent, the apex of the lip is shallowly cleft with apiculate apices in apposition with a small triangular appendix.

**6. *Lepanthes seegeri*** Luer, Orchidee (Hamburg) 38:60. 1987. TYPE: PANAMA. CHIRIQUI: epiphytic in forest above Boquete, alt. 1600–1700 m, Apr 1985, collected by H. Seeger 678A, flowered in cultivation at Heidelberg University 16 Oct. 1985, C. Luer 11424 (HOLOTYPE: MO). For a complete description and illustration see Luer (1987).

*Distribution*.—Only known from Panama.

*Habitat and ecology.*—Epiphytic in cloud forest at around 1600–1700 m of elevation along the Cordillera de Talamanca in western Panama.

*Discussion.*—It is recognized by the erect plants with inflorescences developed behind the leaf, the lateral sepals obtuse, glabrous the upper lobe of petals with a lobule at the inner apical corner, the lower lobe long-ciliate, pubescent and the lip with a long, slender, descending, pubescent appendix that protrudes from a shallow sinus beneath the stigma.

**7. *Lepanthes tarrazuensis*** Bogarín & D. Jiménez, sp. nov. (**Figs. 1D, 5**). TYPE: COSTA RICA. SAN JOSÉ: Dota, Santa María, between Santa María and Naranjillo de Tarrazú, 9°35'33.35"N 83°58'26.74"W, 1615 m, epiphytic, legit Daniel Jiménez, flowered in cultivation at Jardín Botánico Lankester, 14 Feb 2012, *D. Bogarín 9471* (HOLOTYPE: JBL; ISOTYPE: CR).

*A Lepanthes seegeri* Luer, petalis labelloque glabris in apice ciliatis, flavis aurantiacis in base scarlatis, lobo superiore petalorum truncato non lobato, lobulis labelli conniventibus et appendice minore, a *Lepanthes dikoensis* Bogarín & C.M. Sm. stirpe erecta, lobo superiore petalorum trapeziformi, truncato, statim dignoscenda.

**Plant** epiphytic, caespitose, erect herb, up to 14 cm tall. **Roots** slender, flexuous, up to 1 mm in diameter. **Ramicauls** erect to suberect, 3.5–9.0 cm long, enclosed by 7–10 ciliate, lepanthiform sheaths, ciliate especially on new growth; ostia markedly dilated, ciliate. **Leaves** coriaceous, green, elliptic to oblong, acute to acuminate with a short apiculus, 3-veined, 3.2–5.3 × 1.1–2.5 cm; cuneate base narrowing into a petiole ca. 7 mm long. **Inflorescence** racemose, distichous, successively flowered, beneath (rarely above) the leaf, shorter than the leaves, up to 2.5 cm long; peduncle 1.3 cm long; rachis 1.2 cm. **Floral bracts** 1 mm long, ciliate. **Pedicel** 2 mm long, persistent. **Ovary** up to 1 mm long. **Flowers** sepals light orange, petals and lip with the bases scarlet-red and the apices yellowish-orange, the column pinkish-purplish. **Dorsal sepal** broadly ovate, acute, glabrous, connate to the lateral sepals for about 1.2 mm, 3.7 × 3.6 mm. **Lateral sepals** broadly ovate, acute, glabrous, connate for about 1 mm, 3.9 × 2.5 mm. **Petals** transversely bilobed, 1.8 × 4.2 mm, slightly ciliate along the margins; upper lobes oblong-trapeziform, overlapping, apex broadly rounded or truncate; lower lobes smaller than the upper lobes, oblong to narrowly triangular, oblique, apex rounded. **Lip** bilobate, adnate to the column, 1.5 × 2.2 mm expanded; blades ovate, glabrous with ciliate, rounded apices, subfalcate; connectives cuneate, up to 0.7 mm long, perpendicular to the column and not leaving it exposed; body oblong, connate to the base of the column; the appendix oblong, shortly pubescent. **Column** cylindric, 1.2 cm long; anther apical; stigma subapical. **Pollinia** two, ovoid. **Anther cap** cucullate.

*Distribution.*—Only known from the central-southern Pacific region of Costa Rica.

*Habitat and ecology.*—Epiphytic in premontane and lower montane rain forest along the Pacific watershed of Cordillera de Talamanca.

*Etymology.*—From the locality of Tarrazú in San José province. Tarrazú comes from an indigenous Huetar word of unknown meaning.

*Phenology.*—Plants were recorded in flower from February to March.

*Discussion.*—It is similar to *L. seegeri* but differs mainly by the glabrous petals and the lip glabrous with ciliate apices (vs. long ciliate-pubescent), the upper lobe of petals truncate, without lobules at the inner apical corner (vs. oblong, rounded, with lobule at the inner apical corner), the petals and lip basally red, tinged with yellow-orange at apex (vs. completely red without stains), the blades of the lip touching each other above the column (vs. slightly expanded and not touching each other), the appendix shorter, a small triangular lobule, not extending far from the apex of the column (vs. appendix longer, descending, extending far from the apex of the column) (Fig. 1). Other differences are summarized in Table 1.

**8. *Lepanthes trichocaulis*** Luer & R. Escobar, *Orquideología* 17:224–226. 1988. TYPE: COLOMBIA. ANTIOQUIA: Munic. of Yarumal, Briceño, Quebrada El Oro, alt. 1820 m, collected by R. Escobar & E. Valencia, 14 Feb 1984, flowered in cultivation by L. & J. Posada at Colomborquideas 26 Mar 1984, *R. Escobar 3245* (HOLOTYPE: MO). For a complete description and illustration see Luer (1988).

*Distribution.*—Only known from Colombia.

*Habitat and ecology.*—Epiphytic around 1820 m of elevation (Luer 1988).

*Discussion.*—It is recognized by the erect plants, the inflorescences developed behind the leaf, the upper

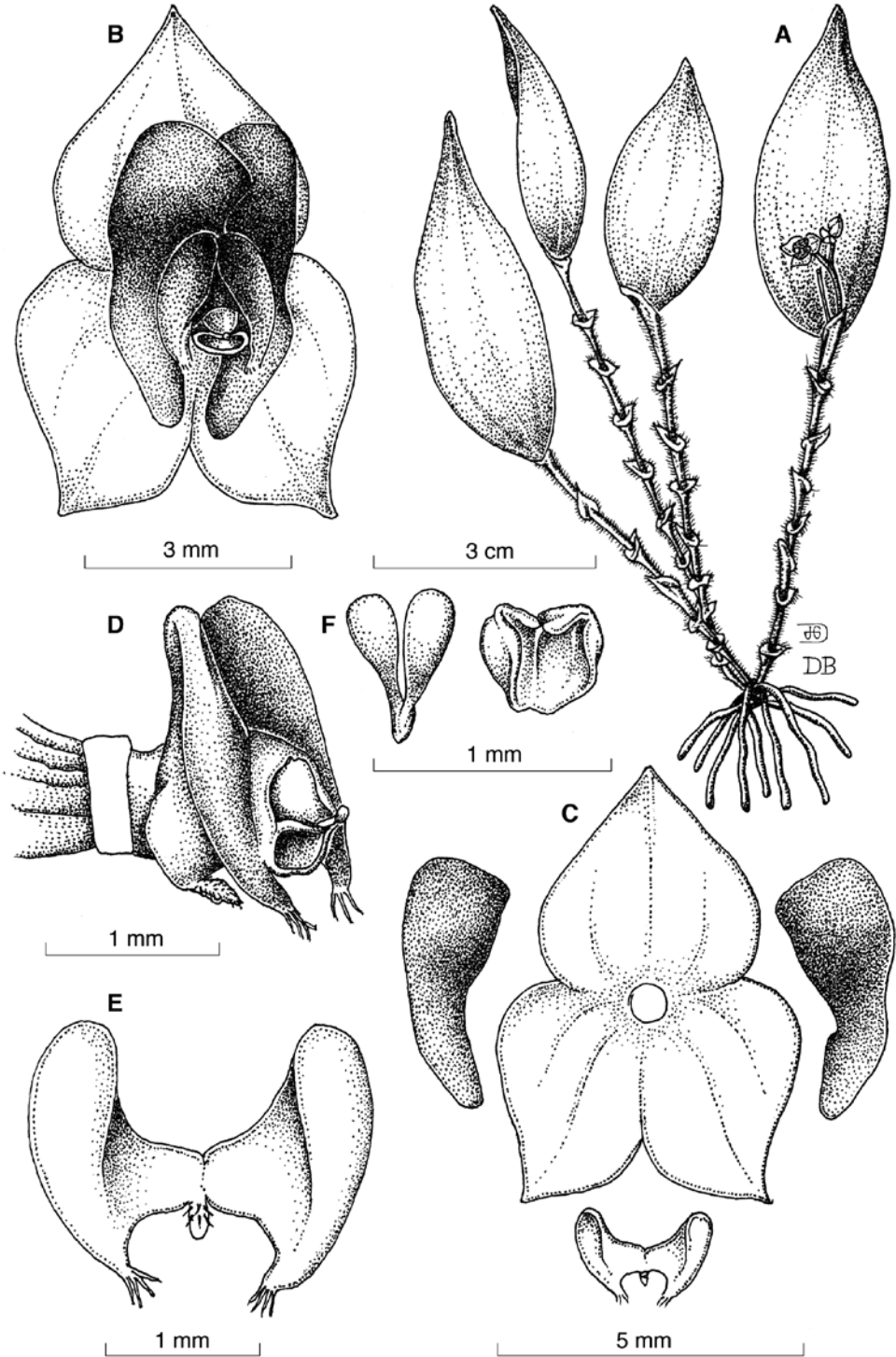


FIG. 5. *Lepanthes tarrazuensis* Bogarín & D. Jiménez. A) Habit. B) Flower. C) Dissected perianth. D) Column and lip, lateral view. E) Lip, spread. F) Pollinarium anther cap. Drawn by D. Bogarín and D. Jiménez from the holotype (JBL-Spirit).

lobe of petals oblong, rounded and not overlapping each other, the lower lobe longer or as long as the blades of the lip a couple of longer hairs in place of an appendix.

**9. *Lepanthes viridis*** Pupulin & Bogarín, *Lindleyana in Orchids, Mag. Amer. Orch. Soc.* 80:179. 2011. TYPE: COSTA RICA. TURRIALBA: Tuis, Cien Manzanas, 9°51'25"N 83°33'47"W, ca. 3,117 ft (950 m), along a minor tributary of Río Pacuare, premontane wet forest, secondary vegetation and remnants of primary, 26 May 2003, F. Pupulin 4801, R. and K. Dressler, J. Aguilar, G. Gerlach, P. Kindlmann, H. León-Paéz, S. Pugh-Jones & E. Serrano (HOLOTYPE: JBL). For a complete description and illustration see Pupulin and Bogarín (2011).

*Distribution.*—Only known from Costa Rica.

*Habitat and ecology.*—Epiphytic in premontane wet forest on the caribbean slopes of Cordillera de Talamanca.

*Discussion.*—It is superficially similar to *L. pan*, from which it mainly differs by the distinctly obovate leaves (vs. orbicular and shortly acuminate), the yellow flowers with bright green petals (vs. peach and red), the lateral sepals shorter than the dorsal sepal (vs. equal in length), the densely villose petals (vs. upper lobe pubescent, lower lobe pubescent on the outer half), with the upper lobe rounded (vs. truncate), and the apices of the lateral lobes of the lip acute (vs. obtuse).

#### KEY TO THE SPECIES OF THE *LEPANTHES OVALIS* GROUP

1. Plants erect to suberect to arching.
  2. Inflorescences developed above the leaf.
    3. Upper lobe of petals suborbicular, rounded, yellow with red-purple base, the lower lobe yellow, pubescent, appendix inconspicuous \_\_\_\_\_ ***L. ovalis*** (Sw.) Fawc. & Rendle (Jamaica)
    3. Upper lobe of petals oblong-trapeziform, truncate, red with orange apex, the lower lobe orange with scarlet at base, glabrous with slightly ciliate margins, appendix conspicuous \_\_\_\_\_ ***L. tarrazuensis*** Bogarín & D. Jiménez (Costa Rica)
  2. Inflorescences developed behind the leaf.
    4. Upper lobe of petals flabellate, lower lobe shorter than the blades of the lip \_\_\_\_\_ ***L. erinacea*** Rchb.f. (Costa Rica)
    4. Upper lobe of petals oblong or dolabriform, lower lobe longer than the blades of the lip.
      5. Upper lobe of petals rounded or truncate without lobules at the inner apical corner, lower lobe glabrous or with slightly ciliate margins \_\_\_\_\_ **6**
      6. Upper lobes of petals and bases of the blades of the lip touching one another \_\_\_\_\_ ***L. tarrazuensis***  
Bogarín & D. Jiménez (Costa Rica)
      6. Upper lobes of petals and blades of the lip approximate \_\_\_\_\_ ***L. trichocaulis*** Luer & R. Escobar (Colombia)
    5. Upper lobe of petals with a lobule at the inner apical corner, lower lobe long-ciliate, pubescent.
      7. Lateral sepals obtuse, glabrous; appendix long, descending \_\_\_\_\_ ***L. seegeri*** Luer (Panama)
      7. Lateral sepals acute, pubescent; appendix a minute, triangular lobule \_\_\_\_\_ ***L. pan*** Luer & Dalström (Ecuador)
1. Plants pendent.
  8. Lip expanded, with the lobes distant from each other, leaving the appendix exposed \_\_\_\_\_ ***L. expansilabia***  
Bogarín & C.M. Sm. (Costa Rica)
  8. Lip not expanded, with the lobes approximate, hiding the appendix.
    9. Petals glabrous to minutely pubescent, the lower lobe shorter than the lobes of the lip, apex orange-yellow, lip red \_\_\_\_\_ ***L. dikoensis*** Bogarín & C.M. Sm. (Costa Rica)
    9. Petals ciliate-hispid, the lower lobe as long as the lobes of the lip \_\_\_\_\_ ***L. viridis*** Pupulin & Bogarín (Costa Rica)

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