

MISCELLANEOUS NEW TAXA IN NEOTROPICAL ORCHIDACEAE

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ABSTRACT. Four new orchid species are described and illustrated: *Macroclinium exiguum* Pupulin, *Macroclinium montis-narae* Pupulin, *Prosthechea joaquinae* Pupulin, and *Prosthechea neglecta* Pupulin. *Trichocentrum pfavii* subsp. *dotae* Pupulin also is described and illustrated. *Macroclinium* sections *Aduncaea* Pupulin and *Hirtzae* Dodson & Pupulin, and *Macroclinium* sect. *Macroclinium* subsections *Dalessandrae* Dodson & Pupulin and *Bicolores* Dodson & Pupulin are described. *Trichocentrum* sect. *Lobulatae* Pupulin is proposed to include Mesoamerican taxa with erect lobes at the base of the lip.

Key words: Orchidaceae, *Macroclinium*, *Prosthechea*, *Trichocentrum*

MACROCLINIUM BARB. RODR.

Macroclinium exiguum Pupulin, sp. nov. TYPE: Colombia. Antioquia: Represa del Río Nare (Negro), Mun. Guatapé, 3 Apr. 1967, epiphyte on twigs; flowers pink-straw with violet spots on petals; none open, perhaps autogamous, R.L. Dressler 3010 (Holotype, MO; Isotype, SEL). FIGURE 1.

Inter species generis *Macroclinii* Barb. Rodr. planta parva pseudobulbosa, inflorescentia biflora, floribus magnibus labello trilobato ungue longa auriculis duobus in basi distinguitur.

Plant epiphytic. **Roots** filiform, glabrous. **Pseudobulbs** inconspicuous, subcircular, complanate, closely invested by 2 conduplicate, leaf-bearing sheaths, apically monophyllous, 2.2 mm long, 2.5 mm wide. **Leaves** conduplicate, laterally flattened, subfalcate-elliptic to narrowly elliptic-lanceolate, acute, 0.8–1.2 cm long, 0.2–0.3 cm wide, the basal ones articulate with imbricating sheaths provided with hyaline, scarios margins. **Inflorescence** racemose, 2-flowered, to 1.5 cm long. **Floral bracts** lanceolate, acute, cucullate, shorter than the pedicellate ovary, 2.7 mm long, 1 mm wide. **Ovary** subclavate, 3.8 mm long including the pedicel. **Flowers** small, with pink-straw, hyaline sepals; the petals pink-straw spotted with violet. **Dorsal sepal** narrowly elliptic-lanceolate, attenuate, concave, dorsally carinate, 6.0 mm long, 0.9 mm wide. **Lateral sepals** narrowly linear-lanceolate, attenuate, concave, free, dorsally carinate toward the base, 8.0 mm long, 0.5 mm wide. **Petals** elliptic-lanceolate, attenuate, 6.0 mm long, 0.6 mm wide. **Lip** unguiculate, apically broadly ovate, 3.2 mm long, 1.2 mm wide across the lamina; the claw linear, about 1.4 mm long, arising at the base of the column, free; lamina with a narrow, cuneate isthmus, presenting 2 digitate, deflexed auricles at the base, then abruptly broadly ovate, apically

acuminate, with entire margins. **Column** slender, terete, reflexed at apex, the clinandrium dorsal. **Pollinia** 2. **Fruit** a globose capsule, 4 mm long, 3.3 mm wide.

Distribution. Known only from the type locality in Colombia.

Etymology. From the Latin *exiguus*, “small,” in reference to the diminutive size of the plant.

KEY TO THE COLOMBIAN SPECIES OF MACROCLINIUM

1. Plant without pseudobulbs; leaves not articulate; anther cap adnate to the base of the clinandrium *M. dentiferum*
1. Plant with pseudobulbs; leaves articulate; anther cap free 2
2. Inflorescence 2 flowered *M. exiguum*
2. Inflorescence 3–8 flowered 3
3. Lip basally adnate to the column 4
4. Lip distinctly shorter than column *M. wulschlaegelianum*
4. Lip longer than column 5
5. Claw of the lip shortly adnate to the column; anther cap attenuate, proboscis-like *M. escobarianum*
5. Claw of the lip adnate to the column to over the mid-point; anther cap different *M. junctum*
3. Lip free from the column 6
6. Lip without lateral lobes *M. lineare*
6. Lip with lateral lobes or auricles 7
7. Lamina of lip pandurate; callus glabrous *M. oberonia*
7. Lamina of lip sagittate, with two retrose auricles at the base; callus puberulent *M. xyphophorus*

In the original collection of *Macroclinium exiguum*, no flowers were widely open, and the species is perhaps autogamous (*vide* collector). *Macroclinium exiguum* may be recognized by the diminutive size of the

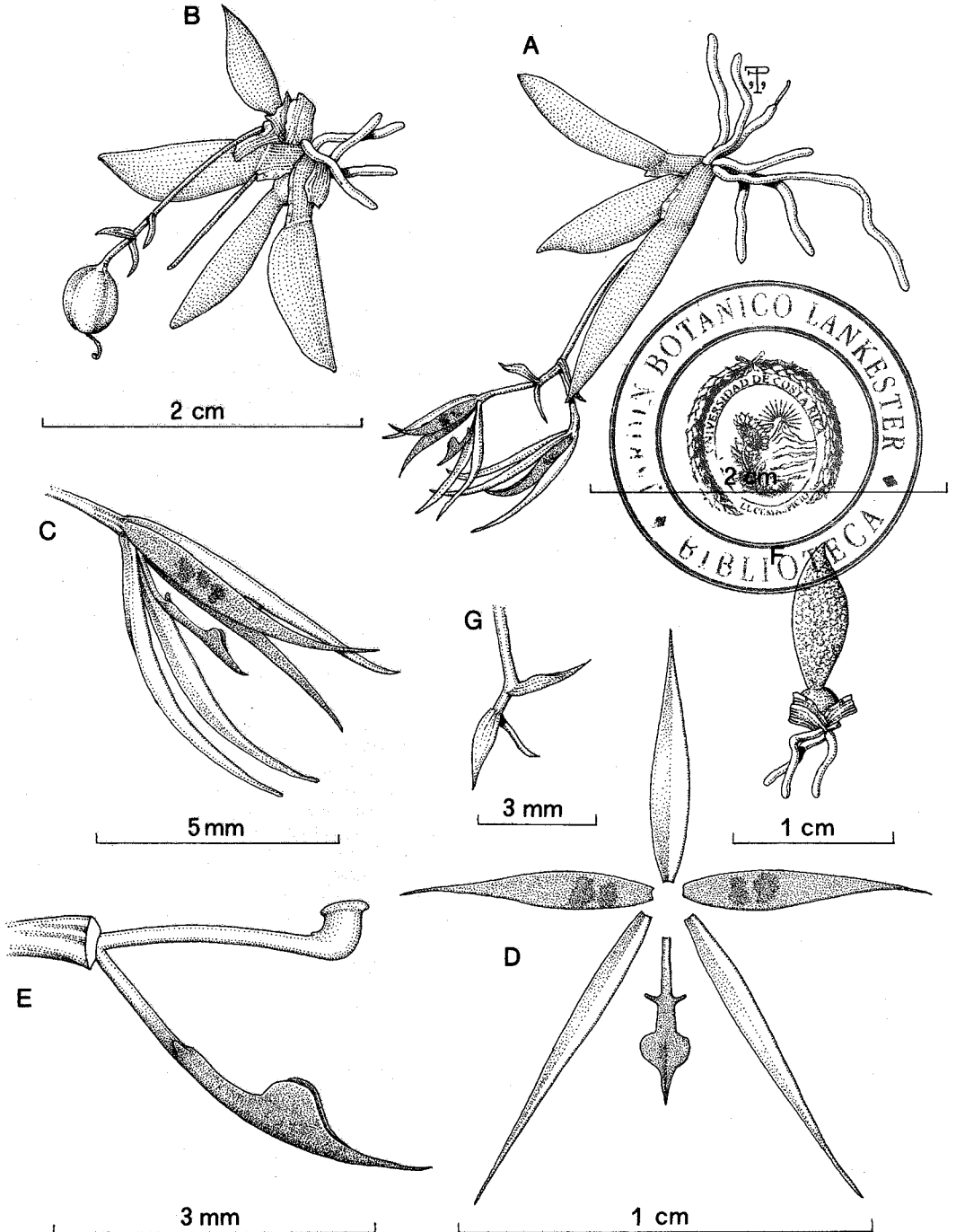


FIGURE 1. *Macroclinium exiguum* Pupulin. A. Habit. B. Fruiting plant. C. Flower. D. Dissected perianth. E. Column and lip, lateral view. F. Pseudobulb and leaf. G. Rachis. Illustration voucher: *R.L. Dressler 3010* (MO). Drawn from the holotype.

TABLE 1. Comparison of members of *Macroclinium* sect. *Aduncae* and sect. *Hirtzae*.

<i>Macroclinium</i>	Pseudobulb	Leaves	Column	Anther	Pollinia
Section <i>Aduncae</i>:					
<i>Macroclinium aduncum</i>	Present	Articulate	Terete, apically bent	Incumbent, free	Obovoid, spherical
Section <i>Hirtzae</i>:					
<i>Macroclinium biflorum</i>	Absent	Not articulate	Apically dilated	Dorsal, adnate	Discoid, complanate
<i>Macroclinium brasiliense</i>	Absent	Not articulate	Apically dilated	Dorsal, adnate	Discoid, complanate
<i>Macroclinium chasei</i>	Absent	Not articulate	Apically dilated	Dorsal, adnate	Discoid, complanate
<i>Macroclinium dentiferum</i>	Absent	Not articulate	Apically dilated	Dorsal, adnate	Subspherical
<i>Macroclinium hirtzii</i>	Absent	Not articulate	Apically dilated	Dorsal, adnate	Discoid, complanate
<i>Macroclinium mirabile</i>	Absent	Not articulate	Apically dilated	Dorsal, adnate	Discoid, complanate

plant, the pseudobulbous stem, and the 2-flowered inflorescences, a character otherwise restricted to the eminently South American species of the section *Hirtzae*. As informally circumscribed by Dodson (1991), the section *Hirtzae* includes *Macroclinium* species presenting only 3–5 leaves and subcapitate, 2-flowered, successive inflorescences (Pupulin 1997b). Following this circumscription, *M. exiguum* might be placed in section *Hirtzae*, except that plant habit (i.e., pseudobulbous stem), lip shape (i.e., presence of small, lateral auricles), and column structure (i.e., column terete and operculum not adnate to the base of the androclinium) suggest treating this species as a member of section *Macroclinium*. This requires an amendment of the diagnostic characters of section *Hirtzae*.

Macroclinium section **Hirtzae** Dodson & Pupulin, sect. nov. TYPE: *Macroclinium hirtzii* Dodson, Icon. Pl. Trop. 10: sub pl. 939. 1984.

Macroclinium Sect. *Hirtzae* Dodson, *nom. nudum*, Nat. Col. Orch. 2: 264. 1991.

Herbae caulibus epseudobulbosis, foliis non articulatis, inflorescentia biflora, columna apice incrassato, anthera dorsalis, operculo affixo, polliniis complanato-discoideis dignoscenda.

Etymology. After *Macroclinium hirtzii*, in honor of Alex Hirtz of Quito, Ecuador, for his outstanding contribution to the knowledge of orchids.

Section *Hirtzae* includes six species mainly restricted to Amazonian South America.

KEY TO THE SPECIES OF MACROCLINIUM SECT. HIRTZAE

- 1. Lip 3-lobed; disc with a multi-digitate callus *M. mirabile*
- 1. Lip simple; disc without a callus, or, with a single tooth 2
- 2. Margins of lip undulate 3

- 3. Claw of the lip with a tooth *M. dentiferum*
- 3. Claw of the lip without tooth *M. biflorum*
- 2. Margins of lip flat 4
- 4. Claw of the lip terete, forming a keel into the blade *M. hirtzii*
- 4. Claw of the lip not terete; blade without keel 5
- 5. Apex of lip acute *M. chasei*
- 5. Apex of lip rounded *M. brasiliense*

Bennett and Christenson (1994) and Thiv (1995) included *Macroclinium aduncum* (Dressler) Dodson in their keys to the informally proposed section *Hirtzae*. *Macroclinium aduncum*, however, differs from typical species of the group, such as *M. biflorum* Bennett & Christenson, *M. brasiliense* (Pabst) Dodson, *M. chasei* Dodson & Bennett, *M. dentiferum* Thiv, *M. hirtzii* Dodson, and *M. mirabile* (C. Schweinf.) Dodson, in a number of features (Dressler 1974). It presents pseudobulbous vs. epseudobulbous stem, articulate vs. non-articulate leaves, terete and apically bent vs. apically dilated column, incumbent vs. dorsal anther, operculum free vs. adnate to the base of the clinandrium, obovoid and spherical vs. discoid and complanate pollinia (subspherical in *M. dentiferum*), (TABLE 1). To maintain monophyly in the section *Hirtzae*, *M. aduncum* thus needs to be removed and assigned to a separate section.

Macroclinium section **Aduncae** Pupulin, sect. nov. TYPE: *Macroclinium aduncum* (Dressler) Dodson & Chase, Icon. Pl. Trop. 10, sub. pl. 937. 1984. Basionym: *Notylia adunca* Dressler, Orquideología 9: 211. 1974.

Herbae caulibus pseudobulbosis, foliis articulatis, inflorescentia biflora, columna tereti adunca, anthera incumbenti, operculo libero, polliniis subsphaerico-obovoideis dignoscenda.

Etymology. From the Latin *aduncus*, “hood-shaped,” referring to the shape of the column.

This monotypic section only includes *M. aduncum*.

Macroclinium section Macroclinium. TYPE: *Macroclinium roseum* Barb. Rodr., Gen. Sp. Orch. Nov. 2: 236. 1882.

Herbs sympodial with pseudobulbous stems or monopodial with elongate stems, leaves articulate, inflorescence few- to many-flowered, column terete with straight to reflexed apex, anther dorsal, anther cap free, pollinia complanate-discoid.

This section includes 33 species.

Macroclinium section Macroclinium subsection Bicolores Dodson & Pupulin, subsect. nov. TYPE: *Macroclinium bicolor* (Lindl.) Dodson, Icon. Pl. Trop. 10: sub pl. 937. 1984. Basionym: *Notylia bicolor* Lindl., Benth. Pl. Hartw. 93: 1842.

SYN.: Group *Bicolor* Dodson, *nom. nudum*, Nat. Col. Orch. 2: 264. 1991.

Herbae sympodiales caulibus pseudobulbosis, inflorescentia racemosa dignoscenda.

Etymology. After *Macroclinium bicolor*, in allusion to the 2-colored segments of the perianth.

This subsection includes five or six eminently Central American species, ranging from Mexico to Panama. The position of *Macroclinium lezarzanum* (Hágsater & Gonzalez) Dodson is rather questionable in this subsection. Flower morphology agrees with that of *M. ramonense* (Schltr.) Dodson, but the inflorescence is subcapitate, the rachis occupying only the distal quarter of the flower scape (Hágsater & Gonzalez 1976).

**KEY TO THE SPECIES OF MACROCLINIUM
SECT. MACROCLINIUM SUBSECTION
BICOLORES**

1. Lamina of the lip without lateral lobes or auricles *M. montis-narae*
1. Lamina of the lip provided with lateral lobes or auricles 2
 2. Claw of the lip short; lamina pandurate *M. bicolor*
 2. Claw of the lip elongate; lamina with a narrow isthmus 3
 3. Claw of the lip terete, about as long as the lamina *M. robustum*
 3. Claw of the lip not terete, distinctly shorter than lamina 4
 4. Callus covered with thick, conical hairs *M. lezarzanum*
 4. Callus smooth 5
 5. Distal portion of the lamina sagittate *M. ramonense*

5. Distal portion of the lamina transversely elliptic *M. confertum*

Macroclinium section Macroclinium subsection Dalessandrae Dodson & Pupulin, subsect. nov. TYPE: *Macroclinium dalessandroi* Dodson, Icon. Pl. Trop. 10: sub pl. 937. 1984.

SYN.: Group *Dalessandroi* Dodson, *nom. nudum*, Nat. Col. Orch. 2: 264. 1991.

Herbae monopodiales caulibus elongatis dignoscenda.

Etymology. After *Macroclinium dalessandroi*, in honor of D. D'Alessandro, Ecuador, for his major contribution to the knowledge of Ecuadorean orchids.

This monotypic subsection, restricted to Ecuador, includes only *Macroclinium dalessandroi*.

Macroclinium section Macroclinium subsection Macroclinium. TYPE: *Macroclinium roseum* Barb. Rodr., Gen. Sp. Orch. Nov. 2: 236. 1882.

SYN.: Group *Manabina* Dodson, *nom. nudum*, Nat. Col. Orch. 2: 264. 1991.

Herbs sympodial with pseudobulbous stems, inflorescence subcapitate, 2- or many-flowered.

This subsection includes 26 species.

Macroclinium montis-narae Pupulin, sp. nov.

TYPE: Costa Rica. San José: Dota. Zona Protectora Cerro Nara. Faldas de Cerro Nara. 09°29'40"N 84°00'50"W, 700–800 m, 5 Dec. 1997, toda la flor blanca con punta lila, O. Valverde 517, A. Estrada, E. Valio & G. Mena (Holotype, CR!). FIGURE 2.

Species *Macroclinium lineare* (Ames & C. Schweinf.) Dodson similis, sed inflorescentia racemosa non subcapitata, sepalo postico attenuato et lamina labelli lineari apice abrupte trullato recedit.

Plant epiphytic, small, cespitose, pendent. **Roots** filiform, glabrous. **Pseudobulbs** inconspicuous, elliptic, complanate, closely invested by 4 or 5 conduplicate, leaf-bearing sheaths, apically monophyllous, 5.0 mm long, 2.5 mm wide. **Leaves** conduplicate, laterally flattened, linear-lanceolate to narrowly subfalcate, attenuate, 1.2–3.4 cm long, 0.2 cm wide, the basal ones articulate with imbricating sheaths provided with narrow hyaline, scarios margins. **Inflorescence** racemose, few-flowered, to 2.7 cm long, provided with 4 conspicuous, triangular-lanceolate, concave, acute bracts, 3 mm long, ca. 1 mm wide. **Floral bracts** lanceolate, acute, shorter than the pedicellate ovary, 2 mm long, 1 mm wide. **Ovary** subclavate, 4.5 mm long including the pedicel. **Flowers** small, with white tepals,

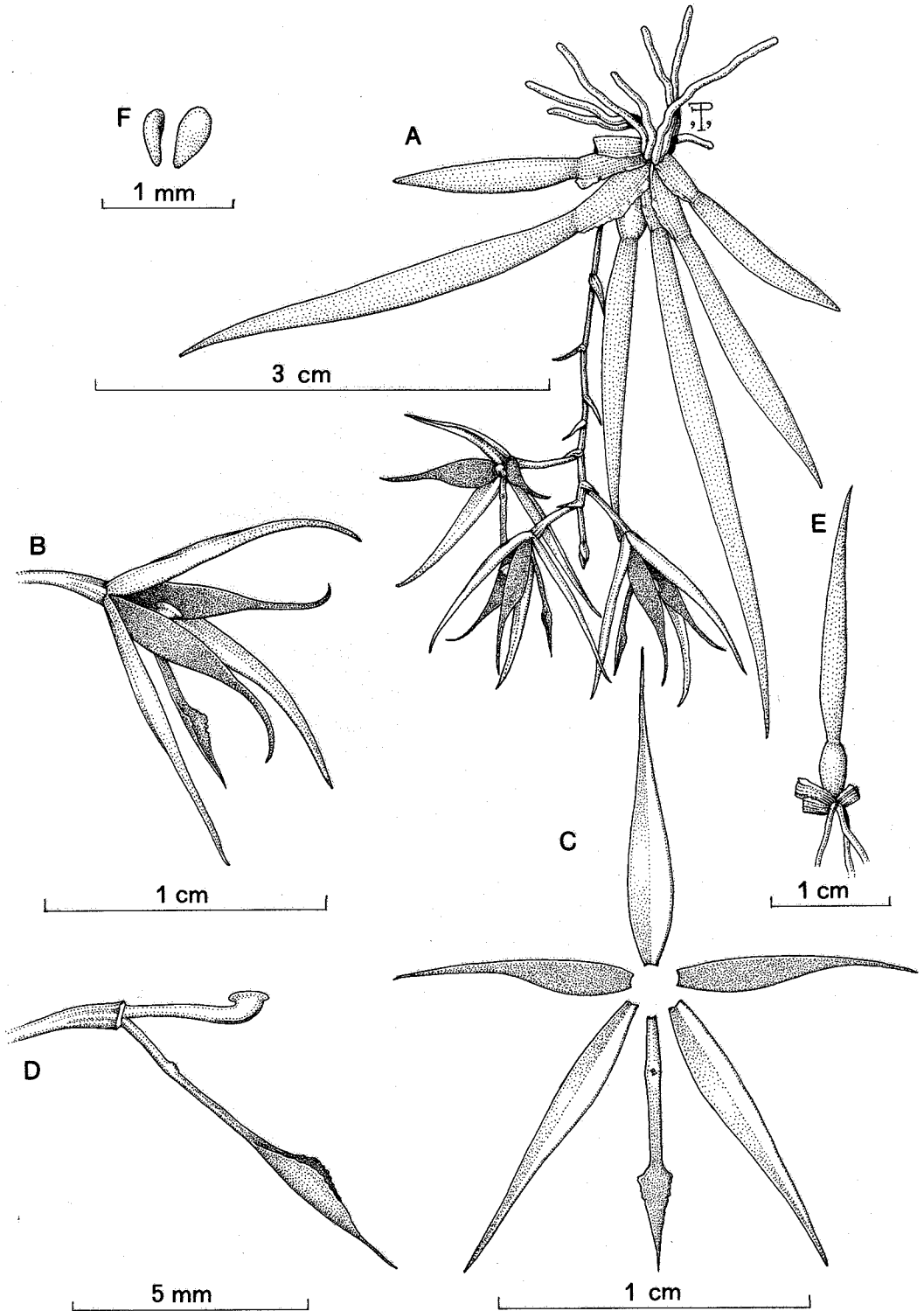


FIGURE 2. *Macroclinium montis-narae* Pupulin. **A.** Habit. **B.** Flower. **C.** Dissected perianth. **D.** Column and lip, lateral view. **E.** Pseudobulb and leaf. **F.** Pollinia. Illustration voucher: *O. Valverde 517, A. Estrada, E. Volio & G. Mena* (CR). Drawn from the holotype.

the column lilac. *Dorsal sepal* lanceolate-elliptic, attenuate, concave, 11.0 mm long, 1.4 mm wide. *Lateral sepals* elliptic-lanceolate, attenuate, concave, free, dorsally carinate toward the base, 10.5 mm long, 1.1 mm wide. *Petals* obliquely lanceolate, abruptly attenuate, 7.7 mm long, 1.1 mm wide. *Lip* unguiculate, apically rhombic-lanceolate, 8.3 mm long, 1.1 mm wide across the lamina; the claw linear, about 1.5 mm long, arising at the base of the column, free; disc obscurely expanded, subcircular, provided with a clump of short papillae; lamina with a narrow, linear isthmus, abruptly expanded into the distal, trullate portion, apically attenuate, with irregularly erose margins. *Column* slender, terete, reflexed at apex, the clinandrium dorsal. *Pollinia* 2, obpyriform, strongly complanate.

Distribution. Known only from the type locality in Costa Rica.

Etymology. Named after the type locality along the slopes of Cerro Nara, in central-Pacific Costa Rica.

Ecology. Epiphytic on twigs in premontane, somewhat seasonal, rain forest, at 700–800 m elevation.

Costa Rican central-Pacific lowlands and medium altitude mountains recently proved to be a very rich and botanically underexplored area, from which many new plant species and new records were reported in the last few years (Hodel et al. 1997, Estrada & Cascante 1998, Pupulin 1998b, 2000a, Sánchez 1998). The Cerro Nara is an isolated mountain reaching 1086 m elevation close to the Pacific coast at some 17 km by air from the mouth of Río Naranjo, Quepos, central Costa Rica. The mountain top and crests host an unusually low-altitude cloud forest, whose botanical exploration is underway. The densely forested northeastern slopes of Cerro Nara were established by the Environmental Ministry as a protected area (“Zona Protectora”).

Considering the small size of *Macroclinium* plants, the recent discovery of so many new species in Costa Rica and elsewhere (Bennett & Christenson 1994, Thiv 1995, Dressler & Pupulin 1996, Pupulin 1996, 2000b, Mora-Retana & Pupulin 1997) is no surprise. *Macroclinium montis-narae* may be easily distinguished from other members of the genus by its racemose inflorescence (a feature found only in Mesoamerican species) and the linear lip ending into the abruptly obtusulate distal portion of the lamina.

The following key is included to emend the key proposed by Pupulin (2000c) in a revision of *Macroclinium* in Costa Rica.

KEY TO THE COSTA RICAN SPECIES OF *MACROCLINIUM*

1. Plant caulescent, the stem to 5 cm long; new growths emerging from upper part of the stem *M. glicensteinii*
1. Plant stemless; new growths emerging from the base of previous pseudobulb 2
 2. Inflorescence a loose raceme 3
 3. Inflorescence <5 cm long; lip linear, then abruptly trullate *M. montis-narae*
 3. Inflorescence >7 cm long; lip not as above 4
 4. Callus of the lip papillose-hirsute *M. robustum*
 4. Callus of the lip glabrous 5
 5. Lateral sepals free; midlobe of lip sagittate *M. ramonense*
 5. Lateral sepals connate; midlobe of lip broadly ovate *M. confertum*
 2. Inflorescence a subcapitate raceme 6
 6. Lip simple *M. lineare*
 6. Lip 3-lobed, the lateral lobes reduced to auricles 7
 7. Lip ecallose *M. doderoi*
 7. Lip with a basal callus 8
 8. Column with abruptly dorsally reflexed apex 9
 9. Lamina of lip cordate, with serrulate margins *M. allenorum*
 9. Lamina of lip narrowly rhombic, with crenulate margins *M. generalense*
 8. Column without dorsally reflexed apex 10
 10. Pseudobulbs >1 cm long *M. cordesii*
 10. Pseudobulbs <1 cm long *M. paniculatum*

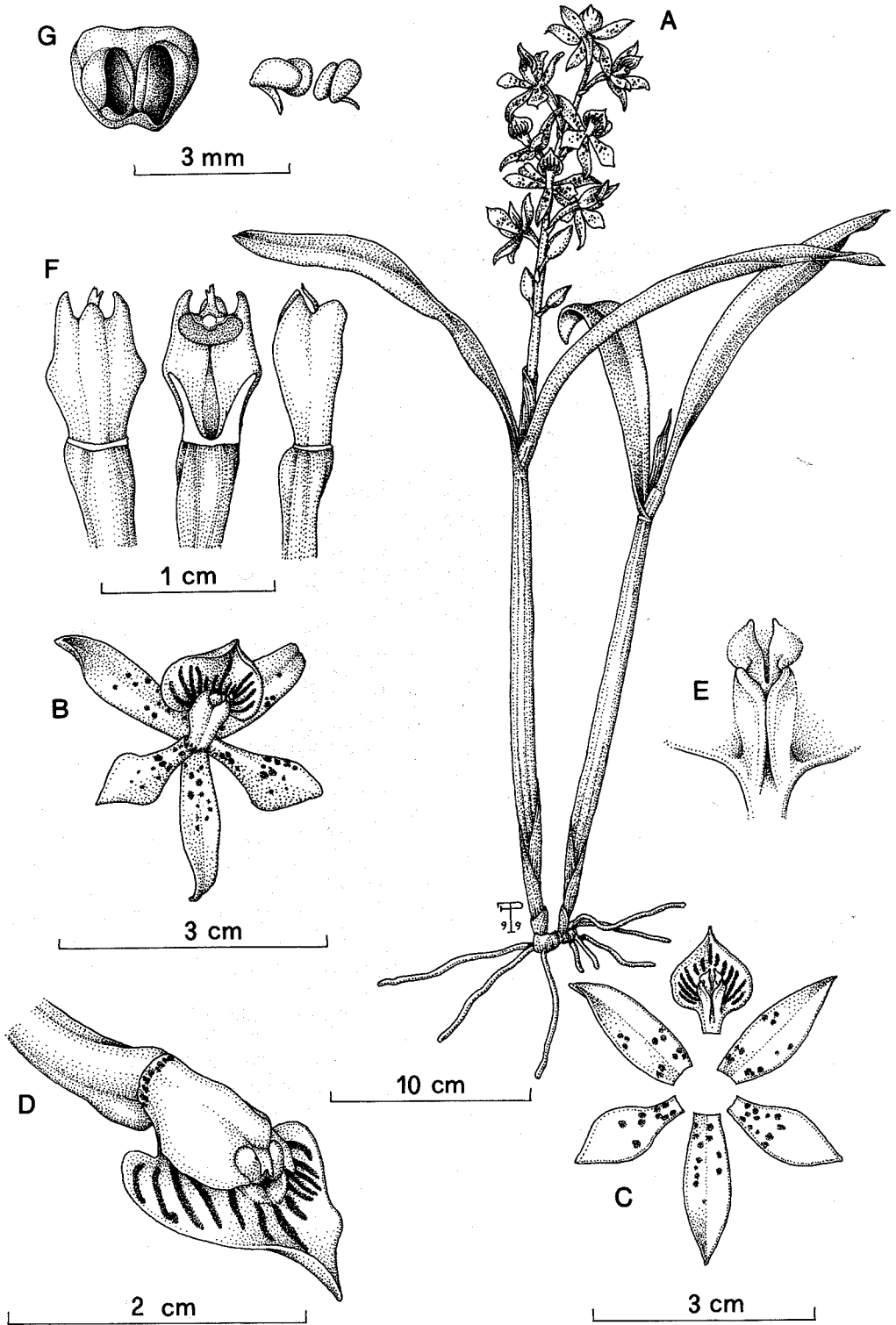
PROSTHECHEA KNOWLES & WESTC.

Prosthechea joaquina Pupulin, sp. nov.

TYPE: Costa Rica. Heredia: Varablanca, ca. 1800 m, collected by Zayda Rodríguez, 1997, flowered in cultivation at El Roble de Alajuela, 4 Dec. 1999, *F. Pupulin 1865* (Holotype, USJ). FIGURE 3.

Inter species generis *Prosthechea* Knowles & Westc. planta pseudobulbis linearibus, inflorescentia racemosa multiflora, floribus magnibus, labello cochleato callis duobus superpositis in basi dignoscenda.

Plant epiphytic, with somewhat elongate rhizome covered by papyraceous bracts. **Roots** flexuous, glabrous. **Pseudobulbs** cylindrical, linear to subfusiform, elongate, sulcate, to 24 cm long, 1.2 cm wide, covered at the base by 3 imbricat-



ing, acuminate bracts, 2-foliate at apex. **Leaves** separated by an internode to 2 cm long, linear-elliptic to narrowly elliptic, fleshy, obtuse, narrowed to the subsessile base, 18.0–22.0 cm long, 2.2–2.5 cm wide. **Inflorescence** terminal, a many-flowered raceme to 19 cm long including the peduncle, emerging from a green spathe to 4 cm long; the flowers opening in succession from the apex. **Ovaries** triquetrous, ca. 1.2 cm long including the pedicel. **Flowers** rather large, fleshy, with sepals and petals free, spreading, brownish yellow, the sepals and petals spotted with brown, the lip white-striped purple. **Dorsal sepal** elliptic-oblancheolate, acute, concave toward the apex, somewhat reflexed at the base, adaxially carinate, 20 mm long, 7 mm wide. **Lateral sepals** obliquely elliptic-lanceolate, acute to subacuminate, slightly concave, adaxially carinate, 20 mm long, 7 mm wide. **Petals** oblanceolate, acute, 16.0 mm long, 7.5 mm wide. **Lip** entire, shortly clawed, basally adnate to the column, 13.5 mm long, 11.2 mm wide; the lamina widely ovate, acute, concave toward the apex; disc with a pair of superposed calli formed by 2 membranous keels uniting centrally and diverging at apex. **Column** stout, dilated at the middle, 10 mm long, provided at the apex with a pair of fleshy, lateral, triangular-subfalcate teeth, and a central 2-dentate projection. **Anther** incumbent, operculate, ovate, bilobed at the rounded apex, 4-celled. **Pollinia** 4, waxy, obovate-complanate, on a short, linear, shortly bifid caudicle.

Paratype. Costa Rica. Without collection data, a plant flowered at the Orchid Exhibition of Alajuela, 29 Oct. 1999, *F. Pupulin 1707* (USJ).

Distribution. Known only from Costa Rica.

Etymology. Named in honor of Joaquín B. García Castro, preeminent student of the Costa Rican orchid flora and well-known teacher of many serious “aficionados” in that country.

Ecology. This species grows as an epiphyte in lower montane and montane wet forests at 1800–2000 m elevation.

Floral morphology indicates relationships with *Prosthechea radiata* (Lindl.) W.E. Higgins, from which the new species differs for the spotted tepals, the widely ovate lip (vs. cordate-subrhenniferiform in *P. radiata*) and the superposed pair of basal calli. Moreover, pseudobulbs are

conical-pyriform in *P. radiata*, whereas they are linear and subterete in *P. joaquinarciana*. Subterete pseudobulbs are also found in *P. baculus* (Rchb.f.) W.E. Higgins and *Epidendrum baculibulbum* Schltr.; however, *P. baculus* regularly produces a very short, 2-flowered inflorescence, the large flowers “back to back” vs. the elongate, many-flowered raceme of *P. joaquinarciana*. On the other hand, *E. baculibulbum* usually has 3-leaved, longer pseudobulbs (>30 cm vs. <25 cm), widely oblong sepals, tepals 12 mm long, and an inconspicuous lip not much longer than the column, characteristics that easily differentiate the two species.

Prosthechea neglecta Pupulin, sp. nov. TYPE: Costa Rica. San José: Dota, San Pedro, ca. 1900 m, flowered in cultivation at Gaia Botanical Garden in Quepos, May 1999, *M. Flores s.n.* (Holotype, USJ). FIGURE 4.

Species *Prosthechea prismatocarpae* (Rchb.f.) W.E. Higgins similis, sed planta plerumque lithophytica pseudobulbis pyriformibus multo longioribus, inflorescentia laxa, ovario ampullaceo, floribus omnino minoribus inodoribusque, sepalibus dorsaliter verruculosus recedit.

Plant lithophytic, with elongate rhizome covered by papyraceous, brown bracts, the internodes to 5 cm long. **Roots** flexuous, glabrous. **Pseudobulbs** narrowly ovate to linear-conic, elongate, to 26.5 cm long, 3.2 cm wide, 2-foliate at apex. **Leaves** separated by an internode to 2.5 cm long, oblong-elliptic to narrowly elliptic, fleshy, obtuse to retuse, narrowed to a conduplicate, subsessile base, 26.0–32.0 cm long, 3.2–3.8 cm wide. **Inflorescence** terminal, a loose raceme to 33 cm long including the peduncle, many-flowered, emerging from a papery spathe to 10 cm long. **Ovaries** subglobose, about 2 cm long including the pedicel. **Flowers** rather large, with sepals and petals free, spreading, yellowish cream; the sepals and petals spotted with purple, the lip rose-purple. **Dorsal sepal** elliptic-lanceolate, acute, somewhat reflexed at the base, adaxially verruculose, to 19.0 mm long, 4.5 mm wide. **Lateral sepals** obliquely linear-lanceolate, acute, subcarinate, slightly concave, adaxially verruculose, 19 mm long, 4 mm wide. **Petals** subfalcate, narrowly lanceolate, acute, 18.0 mm long, 3.5 mm wide. **Lip** 3-lobed, shortly clawed, basally adnate to the column, 15 mm long, 6 mm wide; the lateral lobes rounded, slightly reflexed; the midlobe sagittate, concave, acuminate; disc

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FIGURE 3. *Prosthechea joaquinarciana* Pupulin. A. Habit. B. Flower. C. Dissected perianth. D. Column and lip. E. Callus. F. Column, dorsal, ventral, and lateral views. G. Anther and pollinaria. Illustration voucher: *F. Pupulin 1865* (USJ). Drawn from the holotype.

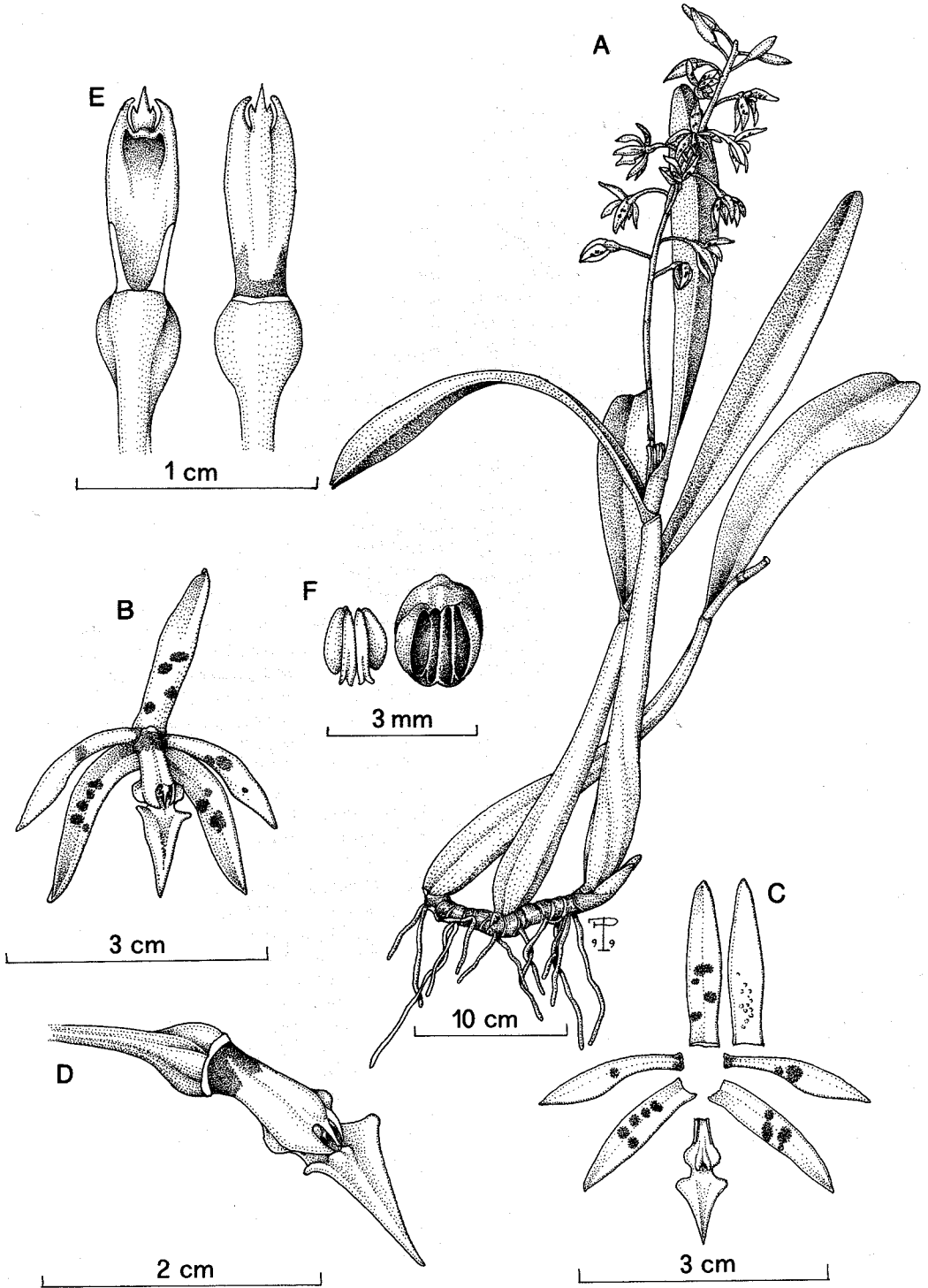


FIGURE 4. *Prosthechea neglecta* Pupulin. A. Habit. B. Flower. C. Dissected perianth, the dorsal sepal in ventral and dorsal views. D. Column and lip. E. Column, ventral and dorsal views. F. Pollinarium and anther. Illustration voucher: M. Flores s.n. (USJ). Drawn from the holotype.

with a callus formed by 2 fleshy keels uniting centrally and diverging at apex. **Column** stout, semiterete, 8.5 mm long, provided at the apex with a pair of fleshy, lateral teeth, and a central, 3-dentate projection. **Anther** incumbent, operculate, subspherical, 4-celled. **Pollinia** 4, waxy, obovate-complanate, on a short, linear, shortly bifid caudicle.

Distribution. Known only from the type locality in Costa Rica.

Etymology. From the Latin *neglectus*, "neglected," alluding to the long time this species has been in cultivation without specific recognition.

Ecology. Lithophytic, usually forming very large clumps in submontane forests at ca. 2000 m elevation.

A close relative of *Prosthechea prismatocarpa* (Rchb.f.) W.E. Higgins, *P. neglecta* may be distinguished from this species by the usually lithophytic habit, the distinctly longer pyriform pseudobulbs (>25 cm vs. <18 cm), the lax inflorescence, the apically swollen ovary, and the smaller (<20 mm vs. >20 mm), scentless flowers, with the sepals dorsally provided with short papillae. Typical forms of *P. prismatocarpa* usually grow in premontane and lower montane forests above 1000 m elevations. Atwood and Mora-Retana (1992) interpreted *P. prismatocarpa* as including some populations with papillose sepals, but their observation of ants exclusively visiting flowers provided with papillae does not support such a wide circumscription. The voucher of the illustration published in Atwood and Mora-Retana (1992) is a plant from Monteverde which lacks papillae on the abaxial surface of sepals. The concept of *P. prismatocarpa* likely includes in Costa Rica several different related species in need of a systematic study based on more distributional, ecological, and morphological data.

Another relative of *Prosthechea neglecta* is *P. ionocentra* (Rchb.f.) W.E. Higgins, of which *Epidendrum auriculigerum* Rchb.f. is likely a synonym, but this species has larger flowers (tepals >4 cm long vs. <2 cm long in *P. neglecta*), the sepals and petals without purple spots, and the midlobe of the lip is triangular-cordate, caudate at apex.

The following key is included to the species close to *Prosthechea neglecta* in Costa Rica, or the *P. prismatocarpa* group.

KEY TO THE COSTA RICAN SPECIES OF THE *PROSTHECHEA PRISMATOCARPA* GROUP

1. Lip entire, without basal lobules . . . *P. brassavolae*

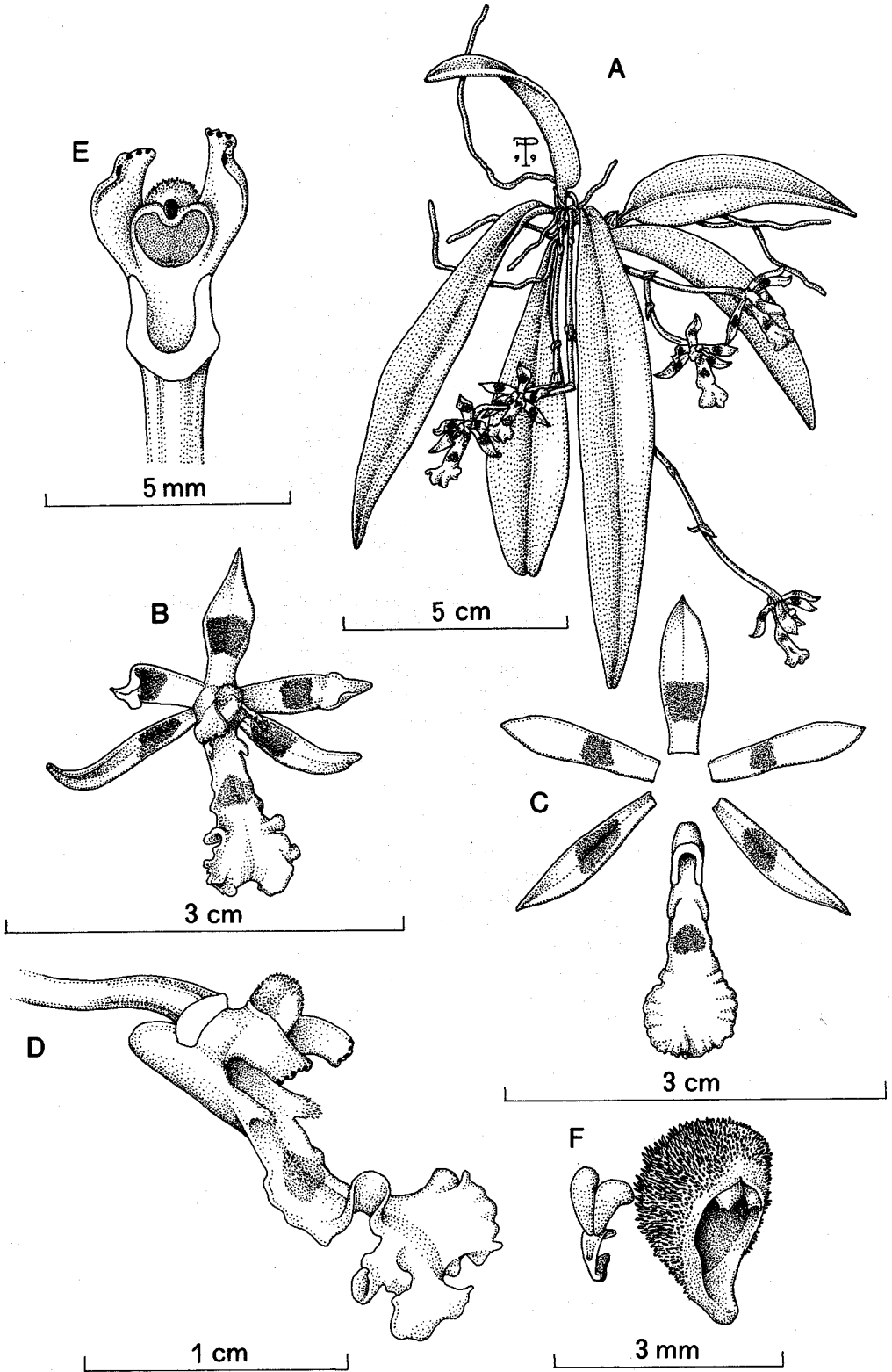
1. Lip 3-lobed, provided with 2 small lobules at the base 2
2. Midlobe of lip triangular-cordate, caudate, >4 cm long; sepals and petals unspotted *P. ionocentra*
2. Midlobe of lip sagittate, attenuate, <3.5 cm long; sepals and petals spotted brown 3
3. Sepals adaxially papillose; ovary swollen; inflorescence lax *P. neglecta*
3. Sepals adaxially glabre; ovary clavate; inflorescence dense *P. prismatocarpa*

TRICHOCENTRUM POEPP. & ENDL.

Trichocentrum pfavii subsp. *dotae* Pupulin, subsp. nov. TYPE: Costa Rica. San José: Dota, Santa Maria, road to San Joaquín, collected by A. Flores, Apr. 1999, flowered in cultivation at Gaia Botanical Garden, 11 Dec. 1999, *F. Pupulin 1871* (Holotype, USJ). FIGURE 5.

A forma typica tepalis omnino minoribus et labello anguste ovato vel spatulato lamina suborbiculari recedit.

Plant epiphytic, caespitose, pendent, with abbreviated rhizome. **Roots** filiform, glabrous, with green apex. **Pseudobulbs** minute, rounded, to 5 mm long, covered by a brown imbricate sheath, unifoliate. **Leaf** oblong-elliptic to narrowly ovate, somewhat fleshy, obtuse to minutely retuse, narrowed to a conduplicate, sessile base, light green, 5.0–12.5 cm long, 1.4–1.9 cm wide. **Inflorescences** 2–4, pendent, shorter than leaves, frequently branched at the base, mostly 2-flowered; peduncle terete, up to 6.1 cm long, concealed by 2 or 3 imbricating, ovate, concave bracts. **Ovaries** linear-clavate, to 2.4 cm long including the pedicel. **Flowers** rather large, with sepals and petals free, spreading, white with a narrow median brown-rose blotch and white lip, marked on the isthmus by a rose-purple blotch. **Dorsal sepal** elliptic-lanceolate, acute to obscurely apiculate, rather concave toward the apex, to 12.5 mm long, 4.0 mm wide. **Lateral sepals** obliquely lanceolate, acute, subcarinate, slightly concave, 14 mm long, 3 mm wide. **Petals** linear-lanceolate, obtuse, to 13 mm long, 3 mm wide. **Lip** spatulate, adnate to the column, 15.5 mm long, the cuneate claw 7.5 mm long, with 2 narrow, erect to falcate, pubescent lateral lobes at the base, expanding gradually into the suborbicular blade 7.5 mm long, 7.5 mm wide, rounded in front, with undulate to crisped margins, producing with the column base a short, blunt, saccate spur 3 mm long. **Column** short, stout, footless, ca. 5 mm long, with a pair of large, erect-spreading, subquadrate, rounded wings spotted with brown along the margins.



Anther white, hemispherical, papillose. **Pollinia** 2, pyriform, on a short, triangular stipe; viscidium elliptic, brown.

Paratype. Costa Rica. San José: Dota, San Marcos, road to San Joaquín, March 1989, F. Pupulin & M. Flores 6 (USJ).

Distribution. Known only from the region of Dota, in Costa Rica.

Etymology. Named for the region of Dota, on the southern slopes of the Cordillera de Talamanca.

Ecology. Epiphytic on mossy branches and vines in lower montane, somewhat seasonal forest, at ca. 900–1100 m elevation.

Trichocentrum pfavii was described by Reichenbach, *filius*, based on a plant collected by the Swiss collector Richard Pfau in Chiriquí. The typical form of *T. pfavii*, which inhabits the wet forests of southernmost Costa Rica and western Panama, presents a large, flabellate, retuse lip and wide tepals, whereas subsp. *dota* shows a spatulate, rounded lip with narrow tepals. Pupulin and Mora-Retana (1994) and Pupulin (1997a) treated the populations from the area of Dota as a geographical race of *T. pfavii*, but the consistence of the distinctive characters suggest assigning this taxon subspecific rank.

Trichocentrum* sect. *Lobulatae Pupulin, sect. nov. TYPE: *Trichocentrum pfavii* Rchb.f., Gard. Chron. 16: 70, 1881.

Labellum lobulis lateralibus in base et calcar interne tomentosum dignoscenda.

Etymology. From the Latin *lobulatus*, “lobulate,” referring to the erect lobes at the base of the lip.

Section *Lobulatae* is comprised of three species.

Senghas (1995: 1939) established *Trichocentrum* sect. *Saccatae*, based on *Trichocentrum capistratum* Lind. & Rchb.f., to include the taxa differing from typical *Trichocentrum* in having a saccate spur. *Trichocentrum capistratum*, together with other Central American species of the genus, namely *T. brenesii* Schltr., *T. caloceras* Endres & Rchb.f., *T. candidum* Lindl., *T. costaricense* Mora-Retana & Pupulin, and *T. cymbiglossum* Pupulin form a distinct subset characterized by a gibbous, saccate, 2–4 lobed spur, a flat or concave lip without callosities or

with 2 obscurely thickened keels at the base, and membranous, semi-hyaline tepals (Pupulin 1995, 1998a). Members of the genus suggested by Senghas to be included in *Trichocentrum* sect. *Saccatae*, i.e., *T. pfavii*, *T. tigrinum* Lind. & Rchb.f., *T. brachyceras* Schltr., and *T. brevicecaratum* C. Schweinf., exhibit a wide range of morphological variations in the shape of lip and spur and likely are best treated under different taxonomic units. *Trichocentrum pfavii* and its allies are restricted to southern Costa Rica and the Chiriquí province in western Panama; they share the presence of short erect lobes near the base of the lip and papillose-hirsute internal walls of the spur (Pupulin 1995, 1997a).

KEY TO THE SPECIES OF *TRICHOCENTRUM* SECT. *LOBULATAE*

1. Inflorescence successive, producing a single flower at a time *T. estrellense*
1. Inflorescence simultaneous, many-flowered 2
2. Spur >5 mm long; column wings striped with brown *T. dianthum*
2. Spur <5 mm long; column wings spotted with brown at apex 3
3. Lip flabellate *T. pfavii* subsp. *pfavii*
3. Lip spatulate *T. pfavii* subsp. *dota*

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FIGURE 5. *Trichocentrum pfavii* subsp. *dota* Pupulin. A. Habit. B. Flower. C. Dissected perianth. D. Column and lip. E. Column, ventral view. F. Pollinarium and anther. Illustration voucher: F. Pupulin 1871 (USJ). Drawn from the holotype.

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