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## TWO NEW SPECIES AND A NEW RECORD OF *EPIDENDRUM* (ORCHIDACEAE: LAELIINAE) FROM COSTA RICA

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**ABSTRACT.** Two new species of *Epidendrum* are described and illustrated from Costa Rica. *Epidendrum fulfordianum* is compared with *E. chlorocorymbos*, from which it can be distinguished by the much larger flowers, the wider petals and entire, subrectangular, retuse-mucronate midlobe of the lip. Similar to *E. barbeyanum*, the smaller *E. pseudobarbeyanum* can be easily distinguished by the short and straight, few-leaved stems, the few-flowered inflorescence, and the distinctly smaller flowers. A third species, *Epidendrum villotae*, is recorded and illustrated on the basis of a Costa Rican specimen.

**Key words:** Orchidaceae, Laeliinae, *Epidendrum*, *E. fulfordianum*, *E. pseudobarbeyanum*, *E. villotae*, new species, new records, Costa Rica

### INTRODUCTION

Since the publication of “The genus *Epidendrum* in the United States and Middle America” by Oakes Ames and his collaborators at Harvard (Ames et al. 1936), it was clear that a meaningful taxonomy of this widespread, highly diverse and variable, mammoth genus would require a substantial effort by botanists. In many cases, the older names in the genus were used in a very broad sense, more as a way to circumscribe species complexes rather than to identify individual species. That fact in addition to the continuous appearance of floristic novelties to a group poorly defined taxonomically, hampered until recently a clear understanding of the genus’s diversity. Luckily, more than 15 years of highly focused effort by Eric Hágsater and his Mexican group of taxonomists disentangled and cleared up a big part of the group’s issues. Hundreds of new species have been described in that relatively small period of time and many of the oldest concepts have been illustrated and documented, in many cases for the first time.

In Costa Rica species belonging to the genus have been amply collected and studied by a few authors over the years, in particular through the efforts by R. Schlechter, O. Ames and C. Schweinfurth during the first decades of the last century and, more recently, by R.L. Dressler and E. Hágsater, have rendered a great number of new

species and a more complete and adequate species list (Schlechter 1923; Ames 1923, 1924; Ames & Schweinfurth 1925, 1930; Dressler 1993; Hágsater 1993, 1999, 2004, 2006, 2007, 2008; Hágsater et al. 2003).

The most recent treatment of Costa Rican *Epidendrum*, in the “Manual de Plantas de Costa Rica” (Hágsater et al. 2003), suggests that 158 species of the genus grow in the country, but it has become outdated due to the many additional species recorded or described from the country since then. These include 26 species published by Hágsater (2003, 2004, 2006, 2007, 2008), and another 5 by Bogarín et al. (2008), elevating the number almost up to 190, without considering the almost 20 species of *Oerstedella* which have since then been transferred to *Epidendrum*. Most of those missing species names can be found in “*Orchids of the Central-American isthmus*” (Ossenbach et al. 2007).

In an effort to complete the documentation of the genus *Epidendrum* in Costa Rica we have encountered two new species and a new record that are described here. It seems that the list of species belonging to this genus is still far from complete.

### TAXONOMIC TREATMENT

***Epidendrum fulfordianum*** Pupulin & Karremans, sp. nov. TYPE: Costa Rica—Limón: Sixaola, Valle del Río Estrella, Bocuare, near sea level, collected by Ana Cecilia Fonseca,

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March 2004, flowered in cultivation and exhibited at the xxxiv National Orchid Show in San José, 16 March 2005, *F. Pupulin 5570* (Holotype, USJ). FIGURES 1, 4A.

*Epidendro chlorocorymbos* Schltr. *similis*, *floribus majoribus*, *petalis ellipticis*, *labello trilobato*, *lobo intermedio cuadrato recedit*.

Epiphytic, caespitose, sympodial **herb**, 10–30 cm tall. **Roots** basal, flexuous, to 1.5 mm in diameter. **Stem** simple, cane-like, cylindrical, foliaceous. **Leaves** 3–6, subcoriaceous, distributed along the stem, basally embracing the stem, the lamina narrowly elliptic, 3–8 × 0.9–2.0 cm. **Inflorescence** terminal, sessile, subumbellate, short, flowering only once. **Floral bract** much shorter than the ovary. **Ovary** cylindrical, 3–4 cm long. **Flowers** 8–9, simultaneous, resupinate, spreading, no fragrance detected during daytime. **Dorsal sepal** spreading, narrowly elliptic, rounded, the margins revolute, 25–28 × 7.5 mm. **Lateral sepals** spreading, narrowly elliptic, slightly falcate, acute, the margins revolute, 25–28 × 7.5 mm. **Petals** spreading, narrowly elliptic, rounded, with revolute margins, 23 × 4 mm. **Lip** adnate to the column, the lamina subreniform, trilobulate, 15 × 22 mm, with two small, rounded basal calli, the midlobe subrectangular, retuse, mucronate, the lateral lobes suborbicular, rounded. **Column** cylindrical, bent downwards in the apical one third, 14–16 mm long; clinandrium-hood prominently fringed. **Anther cap** ovoid, 4-celled. **Pollinia** 4, rounded.

**Comments.** *Epidendrum fulfordianum* is similar to *E. chlorocorymbos* Schltr., but can be distinguished by its much larger flowers, the wider petals (narrowly elliptic vs. linear, 4 mm wide vs. 1 mm) and the shape of the midlobe of the lip, which is entire, subrectangular and retuse-mucronate vs. bilobed, with suborbicular lobes. *Epidendrum chlorocorymbos* and *E. fulfordianum* both grow in the tropical Caribbean forests, but the first one in the premontane watershed and the second in the lowlands close to sea level. *Epidendrum lagenocolumna* Hágsater & L. Sanchez, from the Pacific rain and cloud forests at 1500–2500 m, has a similar habit but the new species can be distinguished by the spreading sepals, the petals elliptic (vs. linear), and the non-inflated column base.

*Epidendrum fulfordianum* is known only from the type collection in the Río Estrella valley, on the Costa Rican Atlantic coast close to Limón, where it is apparently rare. It is more probable, however, that its rarity reflects the paucity of collections made in the hot Caribbean lowlands, and the difficult taxonomy of this group of *Epidendrum*. The new species would have prob-

ably been overlooked if judges of the American Orchid Society had not called our attention on it for taxonomic determination.

**Eponymy.** Named in honor of Richard A. Fulford of Miami, USA, an accredited judge of the American Orchid Society, who required our awareness on the identity of the new taxon.

**Distribution and ecology.** Known only from the Caribbean coastal plains in Costa Rica, where it is found growing epiphytically in tropical wet forests close to sea level.

***Epidendrum pseudobarbeyanum*** Pupulin & Karremans, sp. nov. TYPE: Costa Rica—Puntarenas: Coto Brus, Las Alturas de Cotón, Zona Protectora Las Tablas, Las Alturas Biological Station, southern slopes of Cerro Chai, 8°56'59"N 82°50'01"W, 1500 m, lower montane wet forest, primary vegetation, 26 October 2005, *F. Pupulin 5839*, *D. Bogarín*, *R.L. Dressler*, *R. Gómez*, *A. Karremans*, *A. Rambelli* & *S. Rambelli* (Holotype, USJ). FIGURES 2, 4B.

*Ab Epidendro barbeyano* Kraenzl. *caule stricto paucifolio*, *inflorescentia pauciflora*, *floribus parvioribus*, *sepalis oblanceolatis*, *petalis patentibus obtusis vel rotundatis recedit*.

Epiphytic, caespitose, sympodial **herb** to 18 cm tall. **Roots** basal, flexuous, to 1.5 mm in diameter. **Stem** simple, cane-like, foliaceous, laterally compressed, straight, covered by loose, inflated, ancipitous sheaths to 4 cm long. **Leaves** 3–4 on the upper part of the stem, distichous, articulate, subcoriaceous, progressively longer, basally loosely embracing the stem, the lamina narrowly elliptic, retuse, 5.5–9.0 × 0.8–1.1 cm. **Inflorescence** a terminal, sessile, congested, few-flowered raceme from the mature growth, less than 1 cm long. **Floral bracts** shorter than the ovary, narrowly ovate, acute, 3.0 × 1.2 mm long. **Flowers** 3–4, resupinate, simultaneous, yellowish green. Pedicellate **ovary** terete-subclavate, rounded in section, to 4.5 cm long. **Dorsal sepal** obovate-oblong, broadly obtuse, slightly revolute, 7-nerved, 20 × 10 mm. **Lateral sepals** obliquely elliptic-oblanceolate, acute, slightly revolute, 7-nerved, 20 × 10 mm. **Petals** oblanceolate, spreading, obtuse to rounded, 5-nerved, 18 × 5–6 mm. **Lip** adnate to the column, 3-lobed-obrhenniform, 20 × 30 mm, the lateral lobes elliptic, exceeding the midlobe in length, separate from the midlobe by deep sinuses, the midlobe triangular, deeply retuse, the base cordate; disc with two short, diverging, rounded calli. **Column** stout, straight, 10 mm long, the clinandrium small, entire, the stigma elliptic. **Anther cap** semiorbicular, 4-celled. **Pollinia** 4,

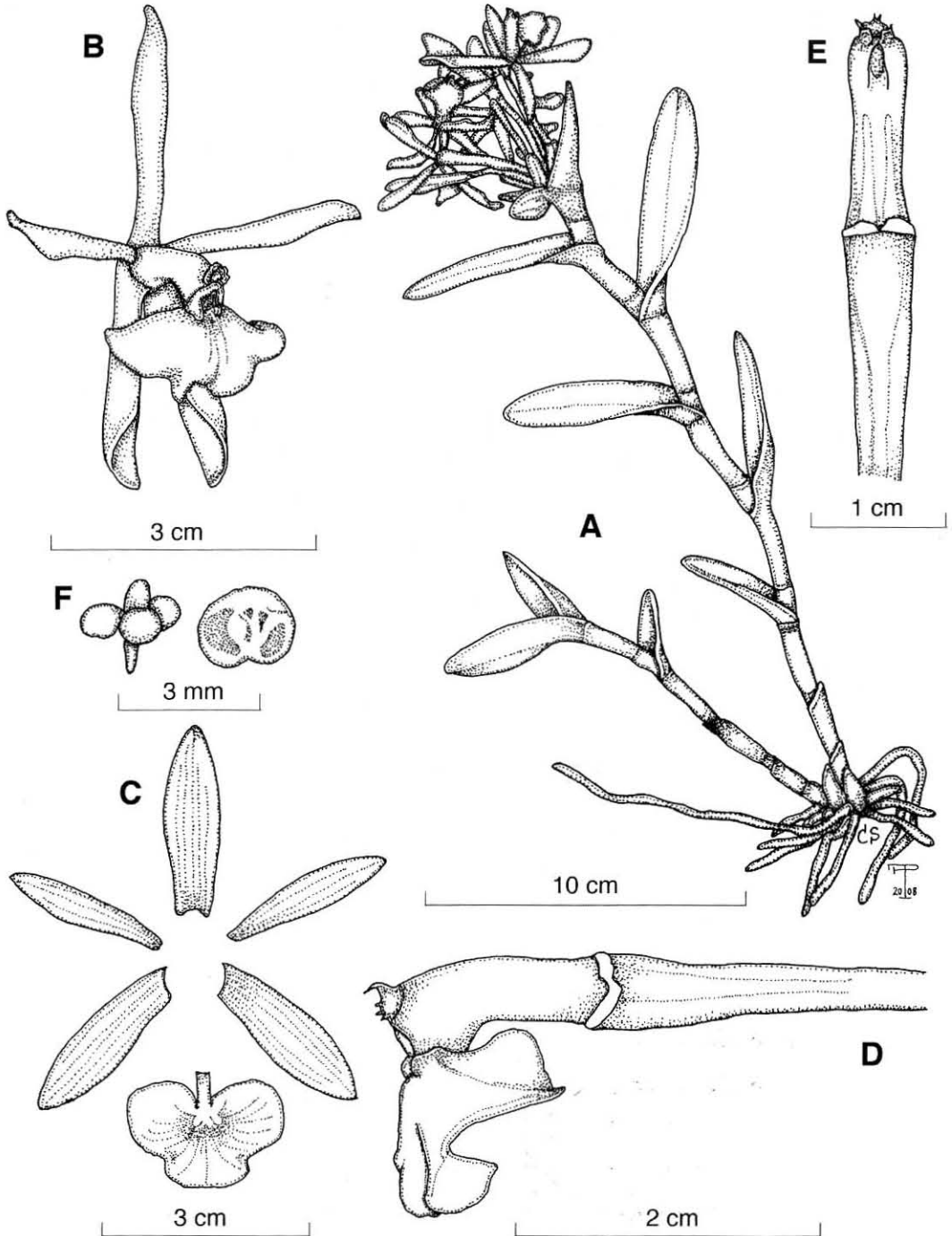


FIGURE 1. *Epidendrum fulfordianum* Pupulin & Karremans. A. Habit. B. Flower. C. Dissected perianth. D. Column and lip, lateral view. E. Column, ventral view. F. Pollinaria and anther cap. Drawn by F. Pupulin & C. Smith from the holotype.

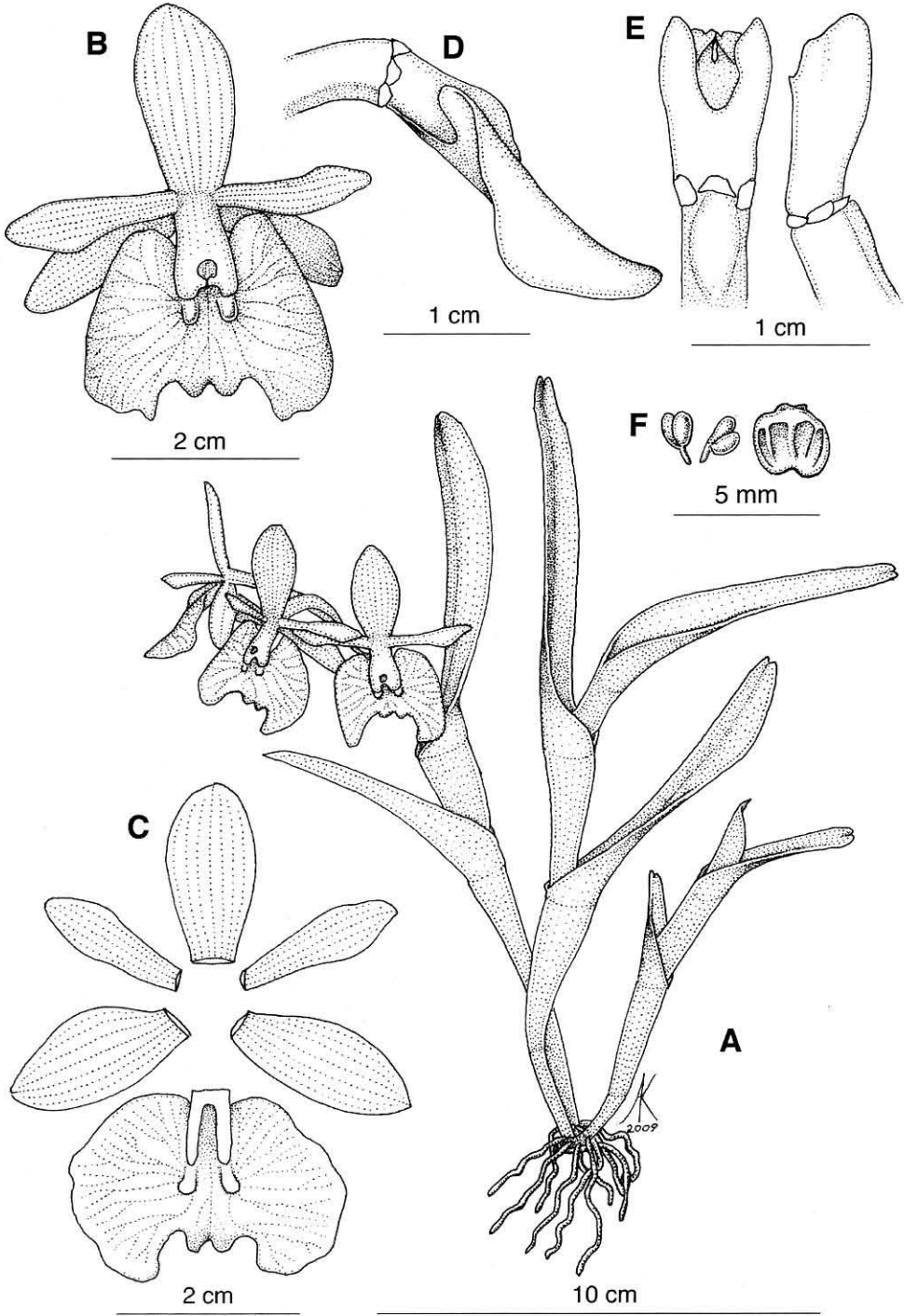


FIGURE 2. *Epidendrum pseudobarbeyanum* Pupulin & Karremans. **A**. Habit. **B**. Flower. **C**. Dissected perianth. **D**. Column and lip, lateral view. **E**. Column, ventral and lateral views. **F**. Pollinaria and anther cap. Drawn by A. Karremans from the holotype.

obovoid, laterally compressed, on short, linear, apically bifid caudicles. **Fruit** not seen.

**Comments.** Among the species of the *Epidendrum difforme* complex, *E. pseudobarbeyanum* is closely allied to *E. barbeyanum* Kraenzl., also originally described from Costa Rica. It can be easily distinguished from the latter by the short (<20 cm long vs. 30 cm) and straight (vs. flexuous) stems, provided with 3 to 4 leaves (vs. 4–8), the few-flowered inflorescence (3–4 flowers vs. 5–10), the distinctly smaller flowers (ca. 4 cm in diameter vs. almost 6 cm), the obovate-oblong sepals (vs. lanceolate), and the spreading (vs. incurved), obtuse-rounded (vs. acute) petals.

**Etymology.** The name refers to its similarity to *E. barbeyanum*.

**Distribution and ecology.** Known only from the Costa Rican southern pacific montane forests in the Coto Brus region, where it grows at around 1500 m of elevation. The type locality of this species is very close to the border with Panama.

**Epidendrum villotae** Hágsater & Dodson, Icon. Orchid. (Mexico) 3: pl. 398. 1999. TYPE: ECUADOR—Esmeraldas: Lita to San Lorenzo km 50, 260 m, 12 May 1990, C.H. Dodson 18221, A. Gentry, B. Boyle & D. Rubio (Holotype, RPSC, not seen; illustration of type!).

Epiphytic, caespitose, sympodial **herb** to 40 cm tall. **Roots** basal, flexuous, to 2.5 mm in diameter. **Stem** simple, cane-like, foliaceous, cylindrical, straight. **Leaves** 5–7, distichous, subcoriaceous, cylindrical, straight. **Leaves** 5–7, distichous, subcoriaceous, distributed along the stem, progressively longer, basally shortly embracing the stem, articulated with the laterally compressed sheath, the lamina linear, obtuse to minutely retuse, 5.5–12.5 × 1–1.3 cm. **Inflorescence** a terminal, distichous, straight, raceme from the mature growth, to 12 cm long, flowering only once, the peduncle and rachis laterally compressed, subancipitous; bracts of the peduncle 3–5, narrowly triangular-conduplicate, acute to acuminate, 2.5–3.5 cm long. **Floral bracts** longer than the ovary, narrowly triangular-conduplicate, ancipitous, acuminate, the apex slightly incurved, 2.5–3.0 cm long. **Flowers** 4–7, non resupintae, successive, subsecund, green. Pedicellate **ovary** terete, slightly inflated adaxially in the apical portion, 2.0–2.5 cm long. **Dorsal sepal** elliptic-lanceolate, subacute, apiculate-mucronate, slightly convex, 5-nerved, 17 × 5–6 mm. **Lateral sepals** obliquely elliptic, acute, mucronate, conduplicate-concave, abaxially carinate, 7-nerved, 16 × 7–8 mm. **Petals** linear-falcate, subacute, minutely rounded, 1-nerved, the apex adherent to the lateral sepals in natural position, 15 × 2 mm.

**Lip** adnate to the column, the lamina reniform, 11 × 18 mm, the base cordate, apically emarginate, with a rounded knob in the sinus produced by the apical extension of the median keel; disc with a rounded, clavate keel running to the apex and two low, rounded, basal calli; total lip 17 × 18 mm. **Column** stout, straight, 10 mm long, the clinandrium small, retuse, the stigma narrowly elliptic. **Anther cap** ovate, 4-celled. **Pollinia** 4, obovoid, laterally compressed, on linear, apically bifid caudicles. **Fruit** not seen.

**Costa Rican material studied.** Limón: Guapiles, Pococí, Hacienda La Cuenca, falda norte del Volcán Turrialba, 10°08'58"N 83°46'46"W, 600–650 m, 1 Jan. 2005, M. Blanco 2771, A. Chávez, L. duToit & C. Ugalde (USJ). FIGURES 3, 4C.

**Comments.** In reviewing the present paper, Eric Hágsater kindly pointed out (pers. comm. 2009) that *E. villotae* is a widespread species along the Chocó and the eastern lowlands of Costa Rica and Panama, as he also indicates in the unpublished manuscript for the *Flora Mesoamericana*. He quoted two additional vouchers for Costa Rica: Limón: Cantón de Salamanca, Bratsi, Amubri, Alto Lari, siguiendo la fila entre Río Dapari y Río Lari, 450 m, 9°25'30"N 83°03'35"W, 3 Mar. 1992, Herrera 5151 (CR, MO); San José: Parque Nacional Braulio Carrillo, Cantón Vazquez de Coronado, La Palma, 1600 m, 17 Feb. 1924, P.C. Standley 38275 (AMES).

*Epidendrum villotae* has been commonly confused with *Epidendrum coriifolium* Lindl., which grows in Guatemala and Mexico and has short, compact plants and simultaneous flowers. *Epidendrum imitans* Schltr. from central Ecuador is also similar, but can be recognized by its closely imbricating floral bracts, linear petals and the subtriangular lip. In Costa Rica, it can be distinguished from the closely allied *E. allochronum* Hágsater, by its 5–7 (vs. 2 or 3), narrower leaves (1.0–1.3 cm wide vs. 1.9–3.2 cm). The also related *E. palmense* Ames and *E. palmidium* Hágsater can be distinguished by the long, narrow, cylindrical stems (vs. robust, thickened), the 5–7 leaves distributed along the stem, provided with a long and narrow lamina, apically retuse (vs. leaves 2–4, apically distributed, wide, the apex bilobed), and the successive inflorescence (vs. simultaneous). *Epidendrum villotae* differs from *E. palmense* in its straight (vs. zig-zag) inflorescence, the much smaller flowers (lip 1.8 cm wide vs. 2.8 cm) the entire (vs. erose-dentate) abaxial keel of the sepals, and the low basal calli of the lip (vs. prominent). It differs from *E. palmidium* by the green flowers (vs. flushed purple), the straight (vs. flexuose) inflorescence, the narrowly triangular (vs. broadly ovate) bracts of the peduncle, and the distinctly longer ovary (>20 mm long vs. <12 mm).

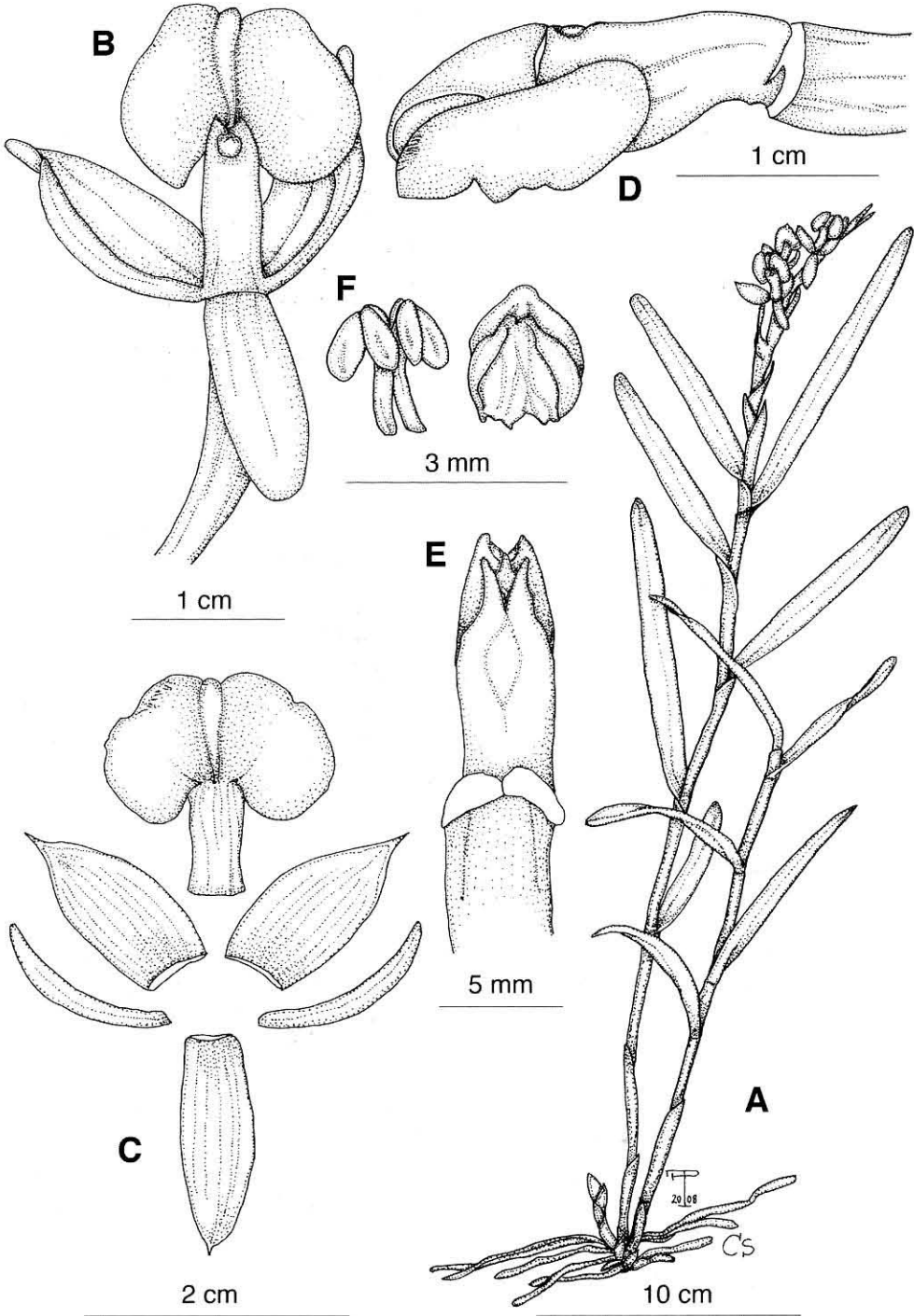


FIGURE 3. *Epidendrum villotae* Hágsater & Dodson. **A.** Habit. **B.** Flower. **C.** Dissected perianth. **D.** Column and lip, lateral view. **E.** Column, ventral view. **F.** Pollinaria and anther cap. Drawn by F. Pupulin & C. Smith from *Blanco et al.* 2771 (USJ).

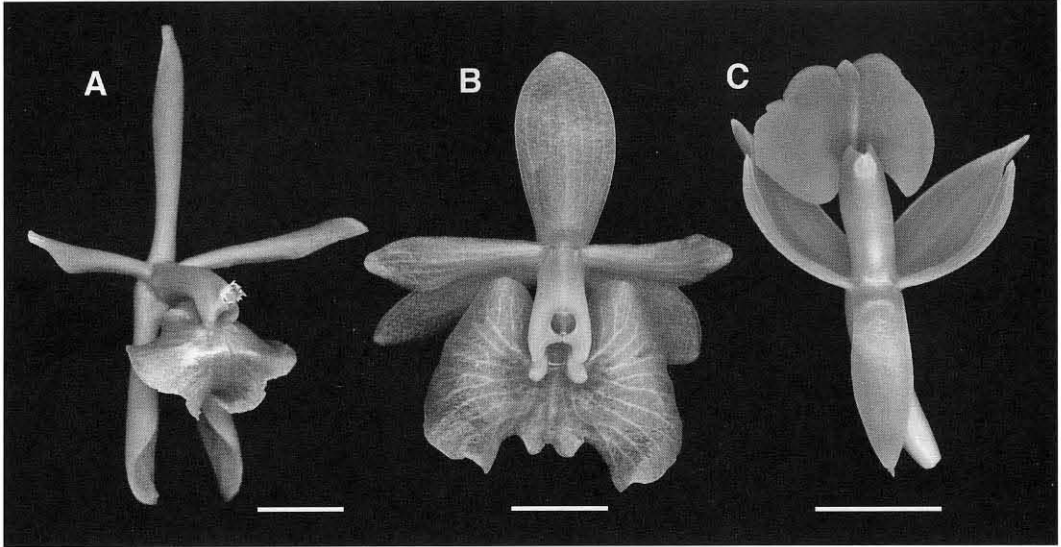


FIGURE 4. **A.** *Epidendrum fulfordianum*, flowers from the holotype; **B.** *E. pseudobarbeyanum*, flowers from the holotype. **C.** *E. villotae*, from Blanco *et al.* 2771. Scale bars = 1 cm. Photographs by F. Pupulin.

**Distribution and ecology.** Known from Costa Rica to Ecuador. In Costa Rica, it is restricted to the Caribbean premontane watershed of the Central Volcanic range and the eastern slopes of the Cordillera de Talamanca, where it grows epiphytically in tropical wet to premontane wet forests at 450–1600 m.

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