



A new *Trichosalpinx* (Orchidaceae: Pleurothallidinae) from the northern Pacific lowlands of Costa Rica

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Abstract

A new species of *Trichosalpinx* from the Pacific lowlands of Costa Rica is described and illustrated. *Trichosalpinx reflexa*, which is morphologically most similar to *T. memor* and *T. ciliaris*, is distinguished mainly by the narrow elliptical leaves, the glabrous sepals and the reflexed synsepal. Information about distribution, habitat and phenology of the new species is also provided.

Introduction

Trichosalpinx Luer (1983) is a Neotropical genus of Pleurothallidinae with more than 110 species, ranging from Mexico to Brazil. The genus is mainly distinguished by the lepanthiform sheaths of the ramicaul (a feature shared with *Draconanthes* (Luer) Luer, *Lepanthes* Sw., *Lepanthopsis* (Cogn.) Ames, and *Penducella* Luer & L.Thoerle), the mostly ciliate, denticulate or fringed petals, and the prominent column foot.

There are 19 species recorded in Costa Rica (Luer 1997, Luer 2003). Although some species are easily distinguished morphologically (e.g. *T. pergrata* (Ames 1923: 24) Luer (1983: 396) and *T. ringens* Luer (1996: 108)), the genus also includes several widely distributed taxa that have been treated as species complexes, often difficult to separate into smaller units due to the highly variable vegetative characters and similar floral architecture. The difficulties in distinguishing the species of *T. blaisdellii* (Watson 1888: 284) Luer (1983: 394) and *T. memor* (Reichenbach 1856: 330) Luer (1983: 396) complexes are often linked to a poorly understanding of natural variation and type specimens and herbarium material that are often difficult to interpret.

Preliminary studies aimed toward a revision of the genus in Costa Rica and field work conducted in the protected areas of Barra Honda, Carara and Diríá National Parks (Bogarín & Pupulin 2007) allowed us to evaluate populations of a *Trichosalpinx* species that is apparently restricted to lowland (< 500 m elevation), semideciduous forest of northern Costa Rica, whereas most of the other species in the western part of the country are recorded in premontane and lower montane forest between 1000 and 2000 m elevation.

The seasonally dry, northwestern area of Costa Rica has been well characterized biogeographically (see references in Bogarín & Pupulin 2007). To the north of the Tárcoles River basin there is a lowland, humid, semideciduous forest with a characteristic orchid flora, several species of which reach the seasonal forests close to the Central Valley. Many of these species have their southern-most distribution in the areas surrounding the Cerro Turrubares, Tárcoles basin and the Candelaria River (Jiménez & Grayum 2002). Within this group we find *Barkeria obovata* (Presl 1827: 99) Christenson (1988: 221), *Cohniella cebolleta* (Jacquin 1760: 30) Christenson (1999: 177), *Cyrtopodium macrobulbon* (La Llave & Lexarza 1825: 42) Romero & Carnevali (1999: 331), *Encyclia cordigera* (Kunth 1815: 341) Dressler (1964: 247), *Laelia rubescens* Lindley

(1840: sub pl. 41) and *Trichosalpinx* species. These data are supported by floristic studies from locations in the central and southern Pacific coast of Costa Rica, where several authors reported the presence of these species (Pupulin 1998, Weber *et al.* 2001, Jiménez & Grayum 2002). The only known *Trichosalpinx* species from the lowland semideciduous forest of Costa Rica is here described and illustrated as new to science.

Materials and methods

This study was conducted mainly at the Lankester Botanical Garden (JBL), University of Costa Rica, between July 2010 and January 2011. Specimens at JBL (from living and spirit collections), and dried material available at USJ, CR and INB was revised. Distribution maps were made using the geographic information system software ArcView GIS 3.3 (ESRI, California, USA). Ecological zones were estimated by using the Holdridge Life Zone System (Holdridge 1967, Holdridge 1987) and the Mapa Ecológico de Costa Rica by Tosi (1969). Phenological data were recorded in the field and from cultivated specimens or herbarium labels. Herbarium specimens were deposited at JBL and USJ herbaria. Sketches of specimens were drawn with a Leica MZ 9.5 stereomicroscope with a drawing tube and conserved in the reference collections of JBL. The new species was illustrated by composite line-drawings from living specimens. Descriptions were prepared from living specimens and herbarium material from CR, JBL and USJ herbaria.

Taxonomy

Trichosalpinx reflexa Mel.Fernández & Bogarín, *sp. nov.*

Ab Trichosalpince memore foliis anguste ellipticis-lanceolatis, sepalis glabris, sepalo postico erecto, synsepalo concavo prope apicem reflexo, petalis longioribus, labello carina media demissa in tertio proximali instructo marginibus lobulorum apicisque ciliatis praecipue distincta.

Type:—COSTA RICA. Guanacaste: Nicoya, San Antonio, Barra Honda National Park, Ceiba trail, area of Las Cascadas, 10°11'15"N 85°20'36.1"W, 210 m, basal transition to premontane wet forest, epiphytes in fallen *Ficus* sp. (Moraceae) tree, 11 July 2005, D. Bogarín 1674 & F. Paniagua (holotype JBL, isotype CR).

Epiphytic, caespitose herb, erect to suberect, up to 10 cm tall. Roots slender, flexuous, to 2 mm in diameter. Ramicauls slender, terete, 1.5–5.5 cm long, enclosed by two to seven tubular lepanthiform sheaths; the sheaths acute, adpressed at the base, ribbed, minutely ciliate at the dilated margins, brown, 0.8–1.4 cm long. Leaves narrowly elliptical to narrowly obovate, apiculate, erect, fleshy, coriaceous, green suffused with purple beneath, 2.7–5.4 × 0.7–1.4 cm, the cuneate-attenuate base narrowing into a petiole up to 0.7 cm long, the petiole enclosed by the tip of the apical ramicaul bract. Inflorescence distichous, a –successively flowering raceme with four to eight flowers, 1.2–1.6 cm long including the peduncle 4 mm long, produced at the base of the leaf from a conduplicate, linear-ovate, acute spathe, 1.0–1.5 × 0.2–0.3 mm. Floral bracts cuneiform, conduplicate, 1 × 1 mm. Pedicels 1 mm long, persistent. Ovary cylindrical, 1 mm long. Flowers with the sepals white suffused with dark purple toward the apex, petals translucent white, the lip blackish purple, the column and anther white. Dorsal sepal erect, oblong, obtuse, convex toward the apex, 3.5–4.5 × 2.0–2.5 mm, three-veined. Lateral sepals connate into an ovate-oblong, retuse, entire synsepal, concave at the base and reflexed toward the apex, 3.0–4.0 × 2.0–2.5 mm, three-veined. Petals oblong, acute, entire or serrulate, the apex erose, 1.3–2.0 × 1.0–1.8 mm. Lip oblong, obtuse, ciliate, 2.0–3.0 × 1.5 mm, the disc with a central carina in the basal third, that divides into two low keels close to the second third, the basal lobes erect. Column semiterete, deeply erose-fimbriate at the apex, broadly winged near the apex, 2 mm long, the clinandrium apical, the stigma ventral. Anther cap incumbent, ovate, emarginate. Pollinia two, pyriform, on a cellular, oval viscidium (Figs. 1 & 2).

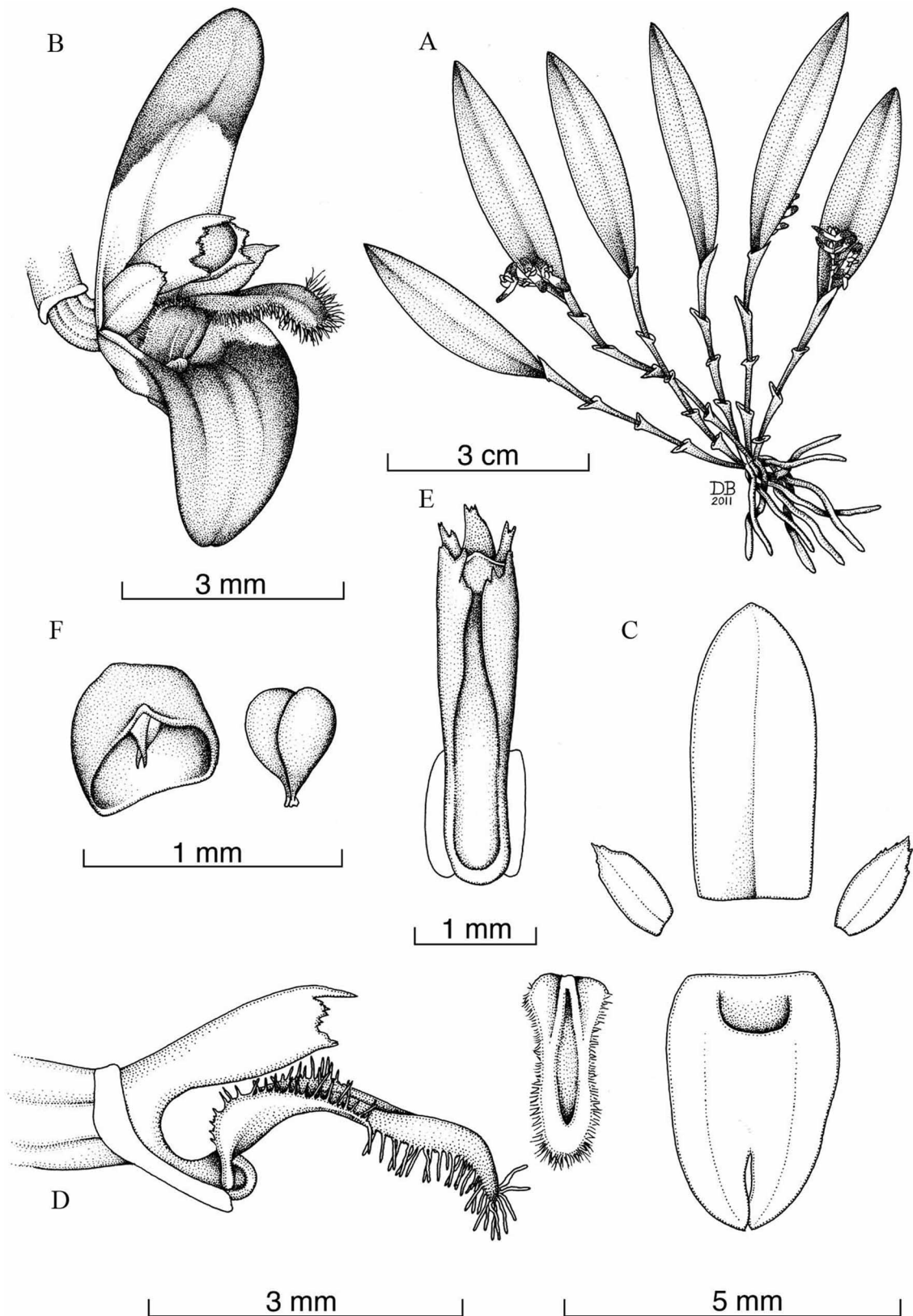


FIGURE 1. *Trichosalpinx reflexa* (from D. Bogarín 1674). A: Habit; B: Flower; C: Dissected perianth; D: Column and lip, lateral view; E: Column, ventral view; F: Anther and pollinaria. Drawn by D. Bogarín.

Distribution and habitat:—*Trichosalpinx reflexa* is restricted to the lowland semi-deciduous forests of the northern Pacific watershed of the Costa Rican mountains. Plants inhabit tropical wet, very wet and transitional premontane forests, between 100 and 500 m elevation. Plants were recorded growing on *Ficus* sp.

(Moraceae) and on the main tree trunks of *Anacardium excelsum* (Kunth) Skeels (Anacardiaceae), mostly along riverbanks under shady conditions (Fig. 3).

Etymology:—from the Latin *reflexus*, referring to the reflexed synsepal of the flowers.

Flowering time:—from September to December.

Additional specimens examined:—COSTA RICA. Guanacaste: Nandayure, 9°54' N 85°20' W, *JBL 00401* (JBL); Santa Cruz, distrito primero, Parque Nacional Dirriá, cuenca del río Enmedio, sendero a la catarata Santa Fe, ca. 300 m, 10°8'50"N 85°36'19"W, bosque de galería a orilla del río, 29 January 2009, *D. Barrantes & M. Rojas s.n.* (USJ)—Puntarenas: Esparza, San Rafael, Río Jesús María, cerca de 500 m río arriba a partir del Puente de Las Damas, 9°57'48.7"N 84°36'35.7"W, 170 m, bosque húmedo tropical, en troncos caídos de *Anacardium excelsum* (Anacardiaceae), 29 December 2000, *D. Bogarín 19*, *A. Prendas & P. Rodríguez* (JBL); Garabito, Jacó, Parque Nacional Carara, sobre el sendero Quebrada Bonita, 9°46'24.1"N 84°36'03.4" W, 110 m, bosque húmedo tropical, epífitas en bosque secundario en ramas caídas cerca de la toma de agua, 19 March 2008, *D. Bogarín 4075* (JBL); Cóbano, Cabo Blanco Absolute Natural Reserve, southern tip of the Nicoya Peninsula, secondary vegetation on former plantations and pasture, and remnants of original tall evergreen forest on steep slopes and stream edges in the Cabo Blanco Nature Reserve, 0–200 m, 9°35' N 85°6'W, 1–7 December 1969, *W.C. Burger & R.L. Liesner 6637* (CR)—San José: Turrubares, San Luis, 1 km después de Pital hacia San Luis, orillas del Río Turrubaritos, 9°49'37.2" N 84°27'45.4" W, 450 m, bosque muy húmedo tropical transición a premontano, epífitas en *Anacardium excelsum* (Anacardiaceae), 28 July 2010, *M. Fernández 195*, *D. Bogarín, R.L. Dressler & C. Smith* (JBL)—without locality data, *JBL 10236* (JBL) (Fig. 3).



FIGURE 2. Photograph of *Trichosalpinx reflexa* (from *D. Bogarín 1674*).

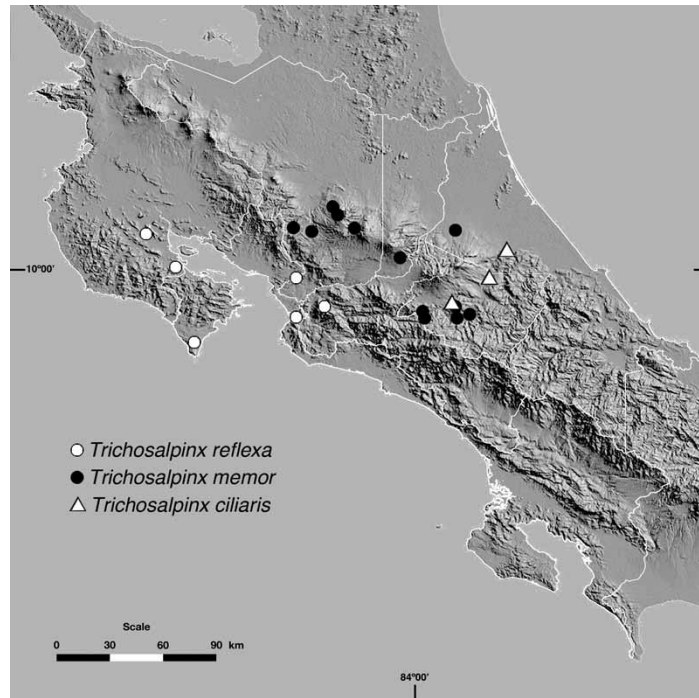


FIGURE 3. Distribution map of *Trichosalpinx reflexa* (white circles), *T. memor* (black circles) and *T. ciliaris* (triangles) in Costa Rica.

Discussion

According to the subgeneric classification of Luer (1997), *T. reflexa* belongs to subgenus *Trichosalpinx*, along with large species complexes present in Costa Rica as *T. blaisdellii* and *T. memor*. This subgenus is distinguished by the non-prolific, caespitose habit, racemes shorter than the leaf, petals ciliate or fringed, and the oblong lip with a central callus and basal lobules (Luer 1997). *Trichosalpinx ciliaris* and *T. memor* are the most similar species to *T. reflexa* (Table 1, Figs. 4 & 5).

TABLE 1. Comparison of morphological characters of *Trichosalpinx reflexa*, *T. memor* and *T. ciliaris* from Costa Rica.

| Character | <i>T. memor</i> | <i>T. reflexa</i> | <i>T. ciliaris</i> |
|--------------|------------------------|-----------------------------|------------------------|
| Ramicaul | straight | straight | fractiflex |
| Leaves | elliptic-ovate | elliptic-lanceolate | elliptic-lanceolate |
| Sepal margin | ciliate | entire | ciliate |
| Dorsal sepal | porrect | erect | porrect |
| Synsepal | not reflexed | reflexed | not reflexed |
| Petal size | 1.3–2.0 × 1.0–1.8 mm | 1.3–2.0 × 1.0–1.8 mm | 1.2–1.7 × 0.2–0.7 mm |
| Petal margin | densely ciliate | entire or serrulate | minutely ciliate |
| Lip callus | ending near the middle | ending near the first third | ending near the middle |

Trichosalpinx reflexa can be distinguished from *T. memor* mainly by the narrow elliptic-lanceolate leaves (vs. elliptic-ovate), glabrous sepals (vs. densely ciliate), the erect dorsal sepal (vs. porrect), the synsepal reflexed towards the apex (vs. straight), the larger and narrower petals 2.0–2.6 × 0.6–1.0 mm (vs. 1.3–2.0 × 1.0–1.8 mm), and the low central keel in the basal third of the lip (vs. prominent central keel ending in the middle of the lip; Fig. 4).

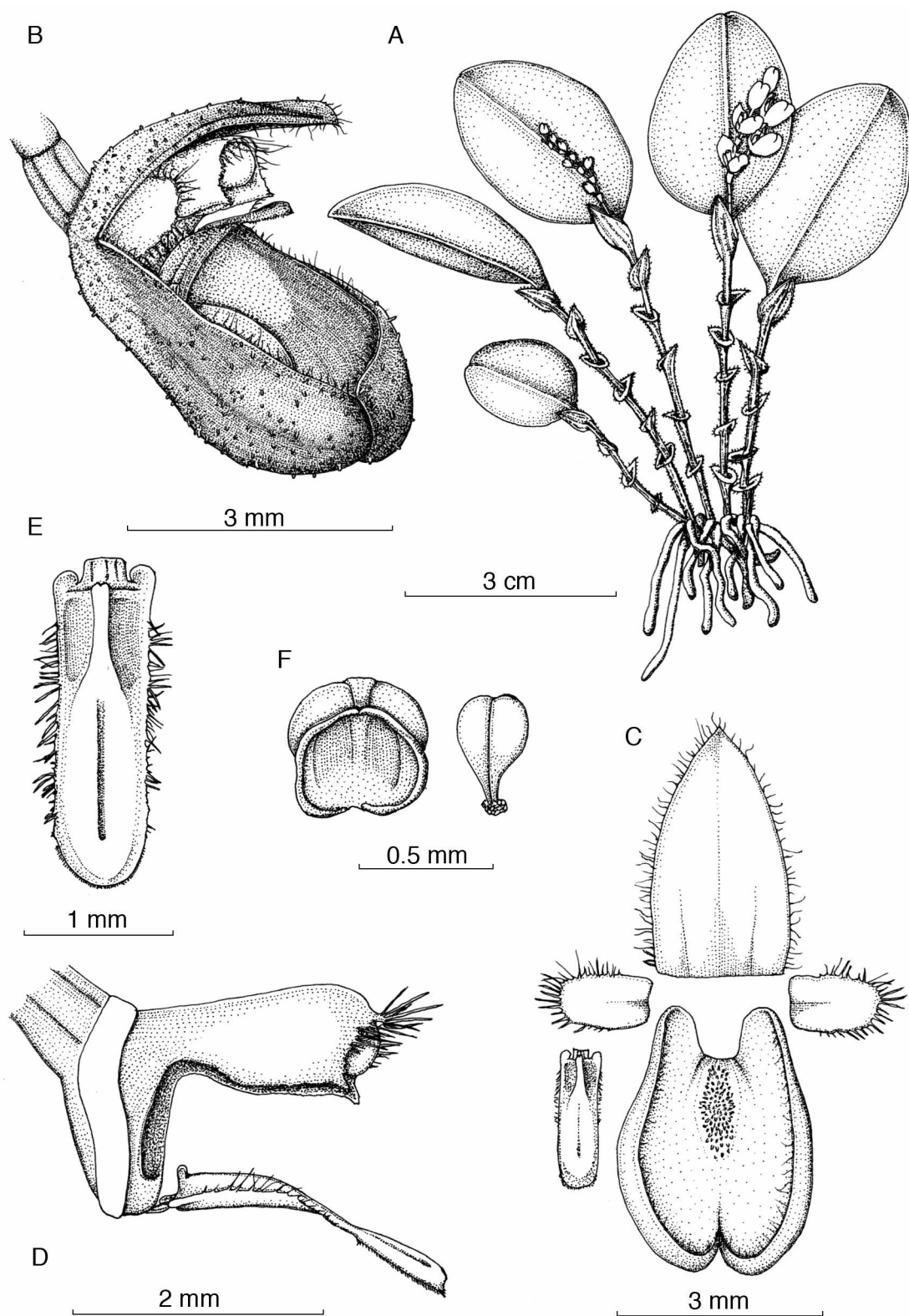


FIGURE 4. *Trichosalpinx memor* (from M. Fernández 12). A: Habit; B: Flower; C: Dissected perianth; D: Column and lip, lateral view; E: Lip, ventral view; F: Anther and pollinaria. Drawn by M. Fernández.

In habit *T. ciliaris* is similar to *T. reflexa*, mainly because the plants are of similar size and have narrowly lanceolate leaves, but the first species can be readily distinguished by the long fractiflex ramicauls and the concave, non-reflexed synsepal (Fig. 5). In Costa Rica, *T. ciliaris* has only been found in the Caribbean

watershed between 100 and 1000 m elevation, whereas *T. reflexa* is restricted to the semi-deciduous tropical wet, very wet and transitional forests of the Pacific watershed between 100 and 500 m of elevation. Even though *T. reflexa* is morphologically similar to *T. memor* and *T. ciliaris*, its features are consistent among all the specimens collected from this area.

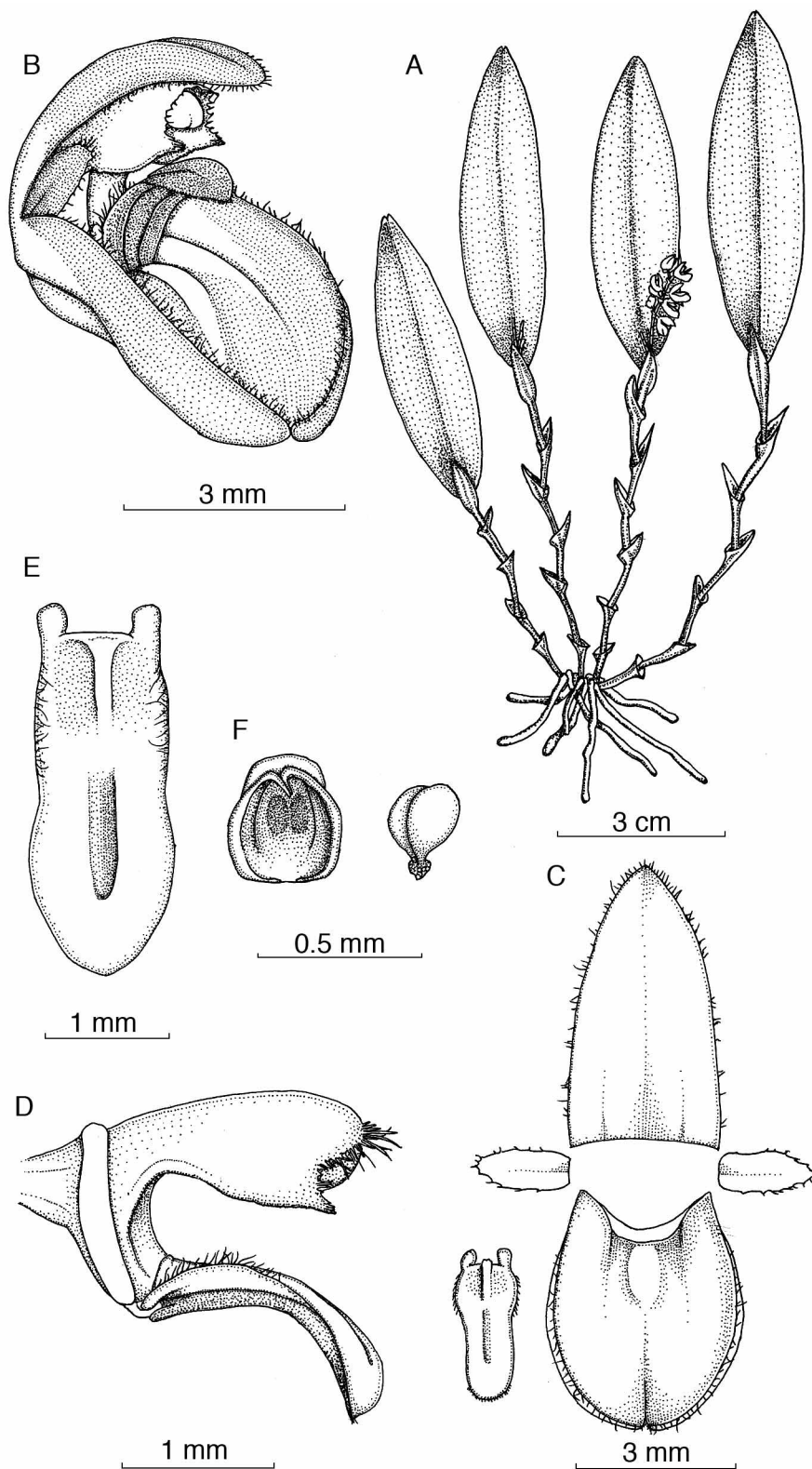


FIGURE 5. *Trichosalpinx ciliaris* (from M. Fernández 328). A: Habit; B: Flower; C: Dissected perianth; D: Column and lip, lateral view; E: Lip, ventral view; F: Anther and pollinaria. Drawn by M. Fernández.

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