

A NEW *MAXILLARIA* (ORCHIDACEAE) FROM PANAMA AND COLOMBIA, AND A BRAZILIAN SPECIES FOUND IN ECUADOR¹

MARIO A. BLANCO^{2,3,5}, KURT M. NEUBIG^{2,6} AND W. MARK WHITTEN^{4,7}

²Department of Botany, University of Florida, 220 Bartram Hall, Gainesville, Florida 32611-8526, USA

³Jardín Botánico Lankester, Universidad de Costa Rica, Apdo. 1031-7050 Cartago, Costa Rica

⁴Florida Museum of Natural History Herbarium, University of Florida, 385 Dickinson Hall, Gainesville, Florida 32611-7800, USA

ABSTRACT: A new species from western Panama, *Maxillaria curvicolonna* M.A. Blanco & Neubig is described and illustrated. It is distinguished by its rhizomatous habit; small, ovoid pseudobulbs subtended by a pair of narrow leaves with purple-spotted sheaths; a single terminal leaf; and white flowers with a sigmoid column. *Maxillaria silvana* Campacci, originally described from southern Bahia state in Brazil, is reported for the eastern slope of the Andes in Ecuador, and an augmented description is provided.

DURING THE COURSE of field collecting for a molecular phylogenetic study of subtribe Maxillariinae (Orchidaceae) (Whitten et al., in preparation), we have collected hundreds of species of *Maxillaria* and related genera in various countries throughout the Neotropics and in public and private orchid collections. Not surprisingly, a few of these have turned out to be a species new to science or new distributional records for known species. Here, we report on two of these cases.

The first is a plant from western Panama. We first saw it without flowers in cultivation in the roadside garden of Sra. Isabel Martínez along the road from the Fortuna Dam area to Chiriquí Grande. According to Sra. Martínez, it grows as an epiphyte on branches of tall trees in the surrounding forests. Its distinctive vegetative habit did not resemble any other *Maxillaria* species previously known for either Panama or Costa Rica. Sra. Martínez kindly gave us the plant, which we exported for cultivation in Florida, where it bloomed 15 months later.

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⁵E-mail: mablanc@ufl.edu.

⁶E-mail: kneubig@flmnh.ufl.edu.

⁷E-mail: whitten@flmnh.ufl.edu.

Maxillaria curvicolonna M.A. Blanco & Neubig, sp. nov.

Plantae epiphyticae, pendulae. Rhizomata longa, ramis divaricatis. Pseudobulbi rotundi, aliquando occulti in foliis subtentis. Folia sublinearia, ad 25 cm longam; vaginae foliorum punctis purpureis. Bracteeae pedunculorum arcte adpressae. Flores albi; medilobi labellorum incurvati; gynostemium sigmoidea.

TYPE: PANAMA. Bocas del Toro: cultivated in roadside garden north of Fortuna Dam site, without exact locality, but from Fortuna area, 08°46'24.9" N, 82°12'24.7 W, 1,111 m; flowered in cultivation at the University of Florida, 10 Feb 2005 (fl.), *M. Whitten 2933* (FLAS).

Plant a straggly epiphyte, somewhat pendent, to 15 cm long. **Rhizomes** 0.8–4.5 cm long between pseudobulbs, 1.5–2.5 mm thick, enveloped by tight-fitting scarious bracts. **Roots** 0.2 mm thick, produced from the bases of pseudobulbs and along the rhizomes. **Pseudobulbs** ovoid to orbicular, biconvex, 0.8–2.0 cm long, to 1.0 cm wide (but narrower in dried material), subtended by two to three leaves and terminated by a single apical leaf; junction with the terminal leaf oblique. **Leaves** thick and leathery, sublinear, 10–25 cm long, 2–5 mm wide; blades apically acute, minutely

naviculate, narrowing gradually toward base; sheaths conduplicate, to 3 mm wide at the base and narrowing toward junction with blade, densely dotted with purple. **Inflorescence** born from base of pseudobulb, single flowered. Peduncle 3.5 cm long, concealed by seven tightly appressed, imbricating, lanceolate-conduplicate, greenish bracts (including floral bract), these 5–20 mm long. Pedicel and ovary 16–17 mm long, exceeded by the floral bract. **Flower** pinkish white, the lip pale yellow with red-brown striping from the base, the midlobe edged with brown, callus orange at apex; column white with reddish striping ventrally. **Sepals** narrowly lanceolate, acute; the dorsal sepal 19 mm long, 5 mm wide; the lateral sepals oblique, 22–23 mm long, 5 mm wide. **Petals** narrowly lanceolate, oblique, acuminate, 16–18 mm long, 3 mm wide. **Labellum** articulated with the column foot, obovate, cuneate, 3-lobate apically, 12 mm long and 8 mm wide when spread, sparsely pilose with capitate trichomes (not pseudopollen); lateral lobes erect, obtuse to round; midlobe rounded to truncate, incurved, to 2.5 mm wide; callus narrowly ligulate, 8 mm long, 1 mm wide. **Column** strongly sigmoid and clavate, 8–9 mm long (excluding anther and foot), 1.5 mm wide, the anther bed entire (not fringed); the anther cap with a prominent central keel; foot 2.5–3.0 mm long, projected backward in the same direction as the column. **Fruit** unknown.

PARATYPES: PANAMA. Bocas del Toro: cultivated in roadside garden near Fortuna Dam site, without exact locality, but from Fortuna area, 08°46'24.9" N, 82°12'24.7 W, 1,111 m, 25 Nov 2003 (sterile), *Whitten, Dressler & Olmos 2632* (FLAS). Division of same plant as the holotype. COLOMBIA. Without further data (fl.). *Shepherd 440-14* (K).

The combination of pendent, divaricately branching rhizomes, small ovoid pseudobulbs, thick sublinear leaves, and a strongly sigmoid column make *Maxillaria curvicolonna* a distinctive species. Before it flowered, we suspected it of being an immature plant of *M. lueri* Dodson, but that species has much longer, subterete linear leaves, shorter rhizomes, and narrow pseudobulbs completely hidden by the leaf sheaths (Atwood, 1999, 2003). The flowers, and especially the labellum, are superficially similar in both species. Despite these similarities, cladistic analysis of DNA data of more than 350 species in the subtribe Maxillariinae (Whitten *et al.*, in prep.) indicate that these two taxa are not very closely related, although both are members of *Maxillaria s.s.*, and not *Ornithidium* or other segregates. In our analyses, *Maxillaria lueri* is sister to *M. brachybulbon* Schltr., while *M. curvicolonna* is rather isolated within *Maxillaria s.s.*

Molecular data do not suggest a hybrid origin for *M. curvicolonna* (recent hybrids usually display polymorphic nuclear ribosomal internal transcribed spacer sequences, or their phylogenetic position according to chloroplast sequence data frequently conflicts with that inferred from nuclear sequence data). Also, the morphology of *M. curvicolonna* is not intermediate to that of any other sympatric *Maxillaria* species.

Maxillaria curvicolonna has small ovoid pseudobulbs with purple spotting on the leaf sheaths, similar to those of *M. acostae* Schltr. However, the latter species is a much smaller, caespitose plant, with much shorter leaves and smaller tan-colored flowers (Atwood, 1999, 2003).

Maxillaria curvicolonna is presently known from a cultivated plant, from Panama (from which two herbarium specimens were prepared), and a single herbarium specimen at Kew, collected in Colombia without exact locality. We feel confident in describing it as a new species because it is very distinctive and different from other species in the genus. Only one flower was produced by the cultivated plant before it succumbed to a bacterial disease. The bases of the sepals and petals were wrinkled (Fig. 1A–C), probably an atypical condition (the herbarium specimen at Kew has smooth sepals and petals, which are somewhat narrower than in the type).

Maxillaria curvicolonna is not showy, even when in flower. The road from the La Fortuna dam site to Chiriquí Grande was paved a few years ago, and the surrounding forests are just being explored in detail; more plants of this species will probably turn up from this area.

ETYMOLOGY: The specific epithet makes reference to the strongly bent column of this species.

A RANGE EXTENSION FOR *MAXILLARIA SILVANA* — We first saw this species in cultivation both at the orchid greenhouses of Ecuagenera in Gualaceo, Ecuador, and at the Atlanta Botanical Garden, Georgia, from material collected near Zamora, Ecuador by FL Stevenson (past president of the AOS) in the 1980s. We were unable to match these plants with any species known to occur in Ecuador (Dodson, 2002, 2004), and we initially considered them to be an undescribed species. But we soon realized that they match the description of *M. silvana* Campacci, a species heretofore known only from the state of Bahia in Brazil (Campacci, 2000). There are also herbarium specimens collected in southeastern Ecuador. One of these collections was made in 1876 by the German consul in Colombia and intrepid botanical explorer, Frederich C. Lehmann, who painted a beautiful watercolor from the plant in life (Fig. 2E, page 454).

The known Brazilian and Ecuadorian populations are separated by more than 4,000 km (2,485 miles) across the southern Amazon basin and the hilly expanses of the Brazilian *cerrado*, and we were initially skeptical of considering both entities conspecific. However, the Ecuadorian plants match the original description of *M. silvana* almost perfectly (Campacci, 2000; Fig. 2). Therefore, we now feel confident in treating them as the same species. Comparison of DNA sequences from both populations would allow us to confirm this assumption, but we have not yet been able to obtain samples from Brazilian plants. We also found a single herbarium specimen at Kew collected from “Quebrada Unión” in Peru (probably in the northern part of that country).

We present the following description of *M. silvana* based on Ecuadorian plants. Measurements from Brazilian plants (given by Campacci, 2000) outside of the range seen in Ecuadorian plants are indicated in brackets.

***Maxillaria silvana* Campacci, *Orquideophilo* 6(2):33, 1998.**

TYPE: BRAZIL. Bahia: south of Bahia, May 1992; flowered in cultivation, 1 Jun 1994, *Edmundo Ferreira da Silva s.n.* (SP, not seen; drawing based on type seen).

Plant a caespitose epiphyte, somewhat pendent, to 15 cm tall. **Roots** 0.3 mm thick. **Pseudobulbs** ovoid to orbicular,

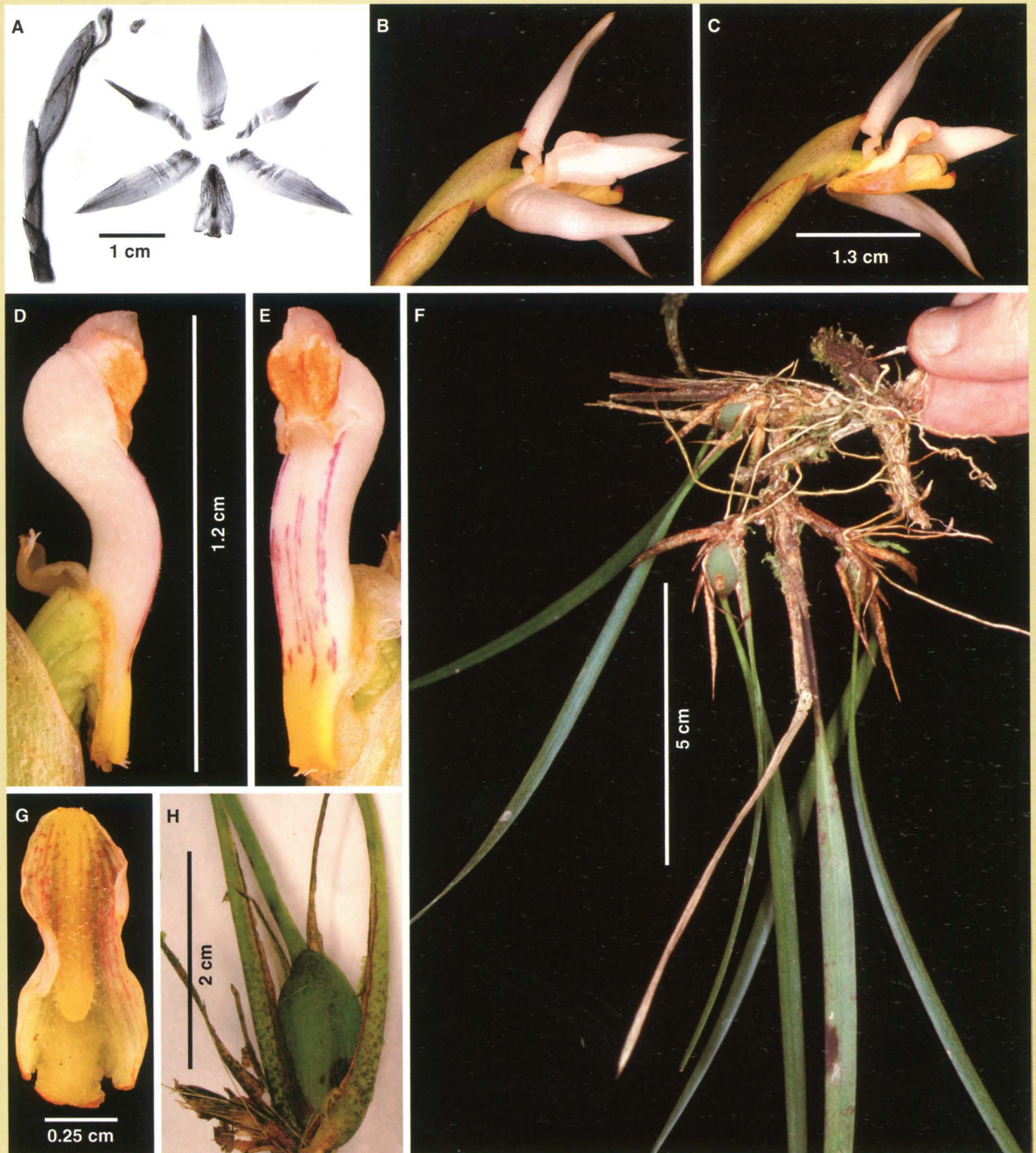


Fig. 1. *Maxillaria curvicolumna* M.A. Blanco & Neubig. A, dissected flower. B, flower from side. C, flower from side with one lateral sepal and one petal removed. D, column, side view. E, column, oblique view. F, plant habit. G, labellum. H, pseudobulb and subtending sheaths. Photographs: Mark Whitten.

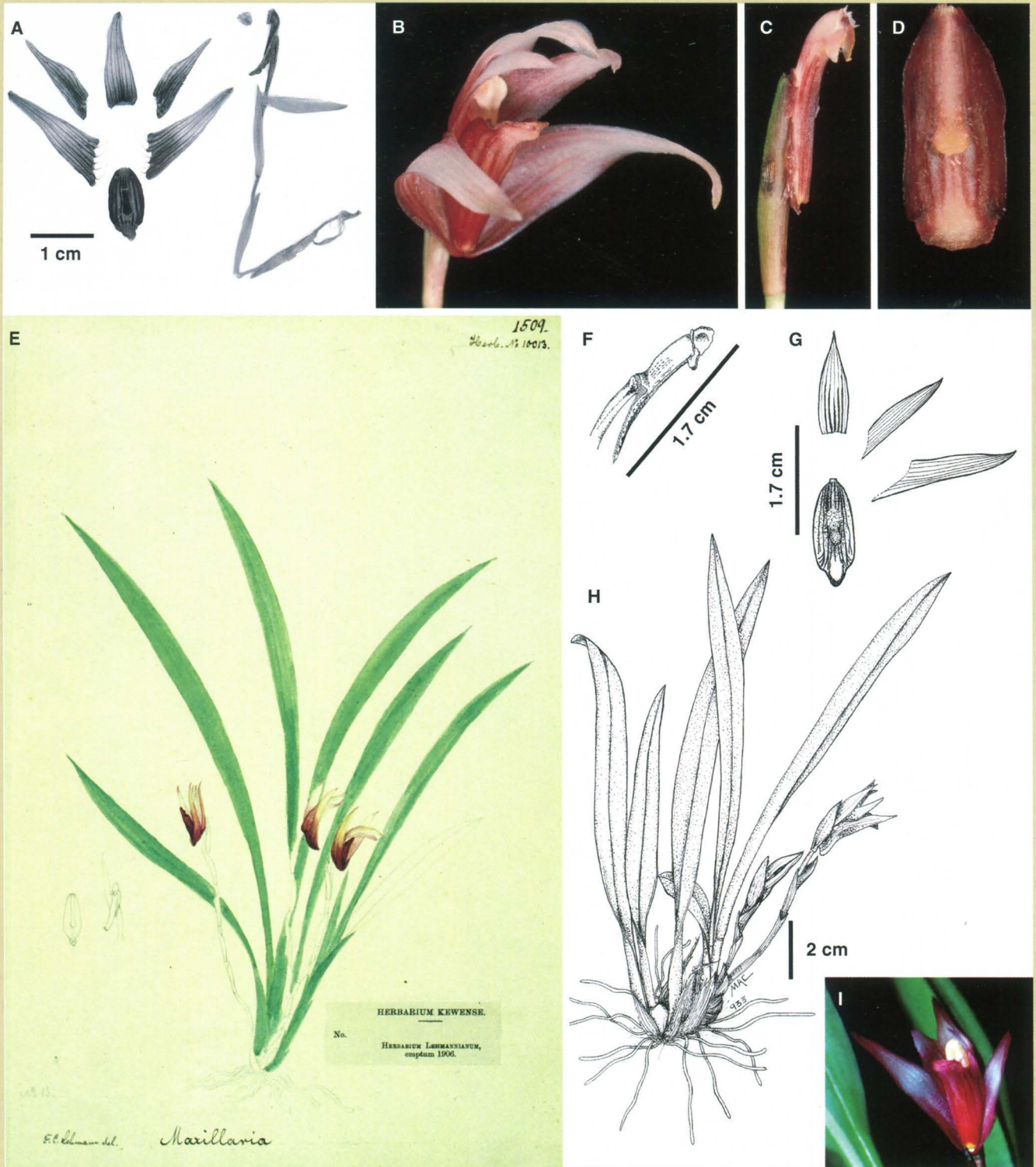
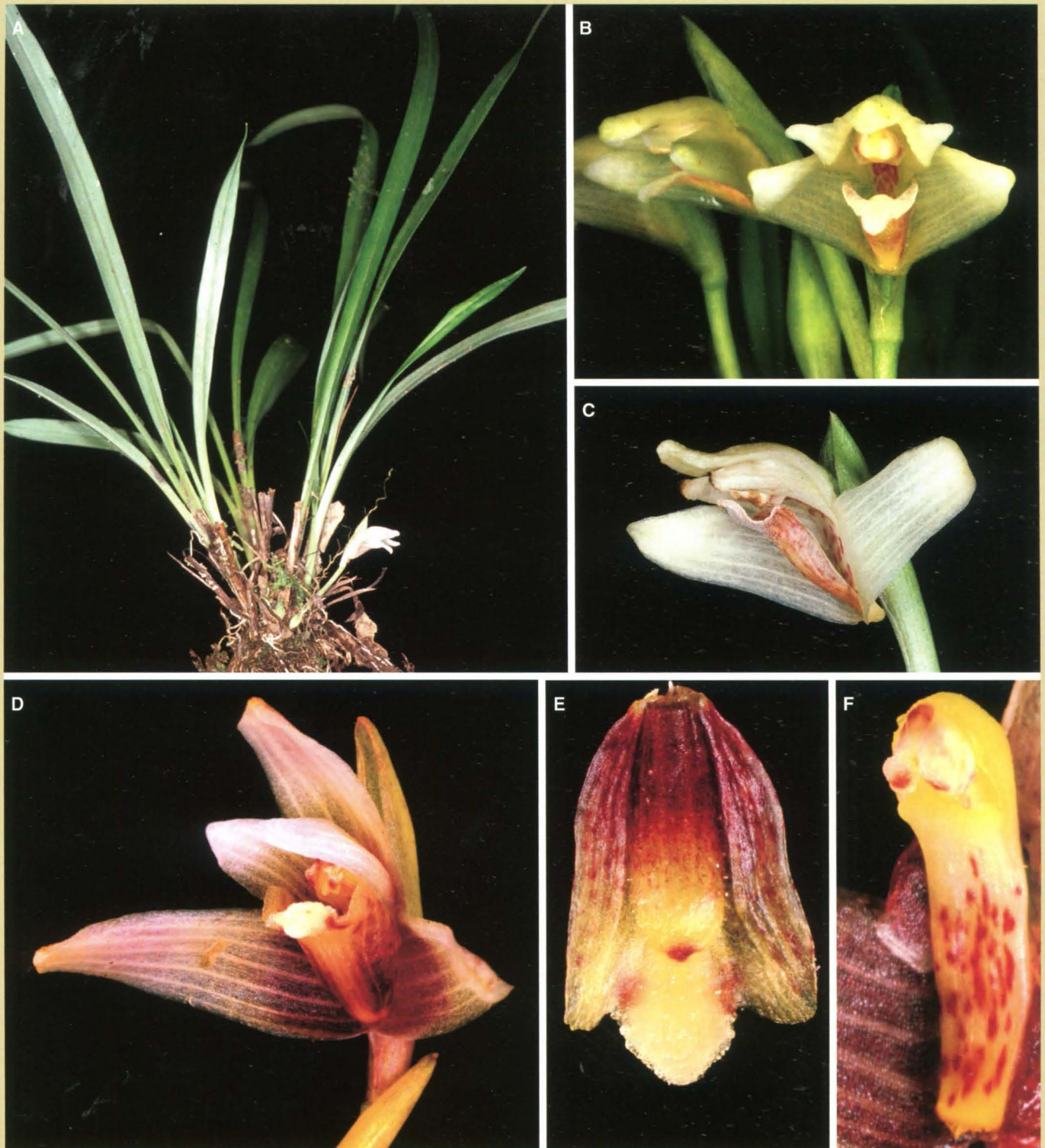


Fig. 2. *Maxillaria silvana* Campacci. A–E, plants from Ecuador; F–I, plant from Brazil. A, dissected flower. B, photograph of flower. C, column. D, labellum. E, painting by F.C. Lehmann (image used with the permission of the Trustees of the Royal Botanic Gardens, Kew.) F, drawing of column. G, drawing of floral dissection. H, plant habit. I, photograph of flower. Images F–I courtesy of M.A. Campacci. Photographs B–D: Mark Whitten.

0.8–2.3 cm long, to 0.7 cm wide (narrower in dried material), subtended by one to three basal leaves (or scarious bracts without blades) and terminated by a single apical leaf; hidden by leafy bracts and not apparent in new growths, but visible in older growths. **Leaves** membranous, sublinear to narrowly lanceolate, 8–38 cm long, 4–9 [–10] mm wide, acute, narrowing gradually toward base; abscission layer of apical leaf projected 1.5–3 cm above pseudobulb on petiole; sheaths conduplicate, up to 4 cm tall, 5 mm wide at the base. **Inflorescence** borne from base of new growths, single



flowered. Peduncle erect, 3.5–6 [–10] cm long, concealed by four to five bracts; the internode immediately before the floral bract sometimes elongated beyond the subtending bract (twice its length). Inflorescence bracts narrowly lanceolate, 1–1.2 cm long. Pedicel and ovary 1.1 cm long, slightly exceeded by the floral bract. **Flower** white to pink, sepals, petals and column with purple-red dots and/or lines toward base, lip pink with dark purple-red longitudinal lines, midlobe pink, tip of callus light yellow. **Sepals** dissimilar, dorsal ovate lanceolate, acute; 1.6–2.0 cm long, 5–6 mm wide;

Fig. 3. *Maxillaria angustissima* Ames, Hubb. & C. Schweinf. A, plant habit. B, flower, front view. C, flower, side view. D–F, *Maxillaria* cf. *breviscapa* Poepp. & Endl. D, flower. E, labellum. F, column. Photographs: Mark Whitten.

lateral sepals triangular, 2–2.5 cm long, [5–] 6–9 mm wide, the oblique base adnate to the column foot. **Petals** elliptic lanceolate, acuminate, 1.5–1.9 cm long, [3.5–] 4 mm wide. **Labellum** articulated with the column foot, elliptic, obscurely three-lobed, 12–14 [–17] mm long, 6–7 mm wide when spread, sparsely pilose within, pseudopollen absent; side lobes erect, decurrent onto midlobe; midlobe triangular to rounded, projecting 3 mm from the rest of the labellum; callus narrowly ligulate, 8 mm long, 1 mm wide. **Column** clavate, 5 mm long (excluding anther and foot), with two triangular apical wings, anther bed fimbriate; foot 6 mm long, projected backward from the column. **Fruit** a dehiscent capsule, 2–2.7 cm long, the six valves remaining united at the apex with the perianth remnants.

SPECIMENS SEEN: ECUADOR. **Morona-Santiago:** Sucua, Rio Upano, 700 m, 20 Apr 1982, *Dalström 198* (SEL). **Zamora-Chinchipe:** Zamora, Rio Yacuambi, 28 Apr 1984, *Dalström et al.* 838 (QCA, SEL); “East of Loja”, 500–1200 m, Nov 1876, *Lehmann 10013* (K; voucher for watercolor number 1509 also at K [Fig. 2E]); cultivated at Atlanta Botanical Garden as “ABG 96-0946, Stevenson 11-21-95, Ecuador 6 Zamora Heights, 5/89/FC”, 12 Mar 2004, *Whitten 2747* (FLAS). **Without exact locality:** Cultivated at Ecuagenera greenhouses in Gualaceo, 25 Jan 2000, *Whitten et al.* 1688 (FLAS), 27 Oct 2005, *Whitten et al.* 3098 (QCA), *Whitten et al.* 3121 (QCA); Cultivated at Andy’s Orchids in Encinitas, California, imported from Ecuagenera, 5 Jan 2005, *Whitten 2897* (FLAS); Cultivated at Ecuagenera greenhouses in El Pangui, 3 Oct 2003, *Whitten et al.* 2485 (QCA). PERU. (province unknown), Quebrada Union, 1440 m, *Hajek 48* (K).

We do not find substantial differences between the Ecuadorian plants and the description of *M. silvana* by Campacci (2000). The Brazilian plants seem to have somewhat longer inflorescences and labella, but the number of plants studied is small and there is still room for unaccounted intraspecific variation.

Maxillaria silvana is similar to *M. angustissima* Ames, Hubbard, & C. Schweinfurth, which occurs from southern Nicaragua to Panama (Atwood, 1999, 2003; Fig. 3A–C, page 455). However, *M. silvana* lacks the warty, dark purple bracts at the base of the pseudobulbs and inflorescences present in *M. angustissima* (characters not mentioned by Atwood). *Maxillaria silvana* also has darker flowers, longer sepals and petals, and a shorter labellum midlobe than *M. angustissima*. *Maxillaria angustissima* grows as a pendent epiphyte in nature, and the similar habit of *M. silvana* (especially the long, narrow leaves) suggests it might grow pendent as well. However, both species can be grown upright in a pot.

Despite the striking similarity between *M. silvana* and *M. angustissima*, they are not sister species according to phylogenetic analyses based on DNA data (*M. Whitten et al.*, unpublished). The South American *M. silvana* appears sister to *M. cf. breviscapa* Poepp. & Endl., a much smaller species from Ecuador and Peru (Bennett & Christenson, 1995; Fig. 3D–F), while the Central American *M. angustissima* appears sister to *M. ramonensis* Schltr. (distributed from Nicaragua to Panama), which has much wider, petiolate leaves.

Maxillaria silvana is also very similar to the Peruvian *Maxillaria leforii* D.E. Benn. & Christenson, which might represent a later synonym (described one year later; Bennett and Christenson, 2001). The description of *M. leforii* was based on a juvenile plant, but it also has the distinctive pendent habit with long, narrow leaves (30 × 1 cm, within the known range for *M. silvana*). No pseudobulbs were mentioned for *M. leforii*, but these structures are very small and normally hidden among leaf bases in *M. silvana*. The flowers of *M. leforii* were described as “violet with a paler whitish-violet band around the center of the flower,” very similar to the flower color of Ecuadorian and Brazilian plants of *M. silvana*. The only significant difference is that the labellum of *M. leforii* appears to have distinctive lateral lobes, instead of being obscurely three-lobed as in *M. silvana*. This could be a matter of degree, but until more plants are examined to study the variation we prefer to recognize them as separate species, which are probably very closely related.

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