

TWO NEW SPECIES AND TWO NEW VARIETIES OF *COLUMNEA* (GESNERIACEAE)

Dos nuevas especies y dos nuevas variedades de *Columnea* (Gesneriaceae)

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ABSTRACT

In this paper two new species of Gesneriaceae (genus *Columnea*) are described and illustrated. *Columnea chocoensis* is distributed in the Colombian departments of Chocó and Valle del Cauca, while its variety, *C. chocoensis* var. *altaquerensis* is restricted to the Department of Nariño, Colombia. *Columnea stilesiana* was found in La Serranía de Los Paraguas located in the Cordillera Occidental between the Chocó and Valle del Cauca Departments in Colombia. Further, *Columnea archidonae* is here considered a variety of *C. ericae*; *Columnea ericae* var. *archidonae* is distributed in Colombia and Ecuador, in forests at elevations higher than those in which the typical variety is found.

Key words. *Columnea chocoensis*, *Columnea stilesiana*, *Columnea ericae*, Gesneriaceae, Chocó Biogeographical Region.

RESUMEN

En este artículo describimos dos nuevas especies de Gesneriaceae (género *Columnea*). *Columnea chocoensis* se encuentra distribuida en los departamentos de Chocó y Valle del Cauca en Colombia, y *C. chocoensis* var. *altaquerensis* se distribuye en el departamento de Nariño, Colombia. *Columnea stilesiana* fue hallada en La Serranía de Los Paraguas localizada en la Cordillera Occidental entre los departamentos de Chocó y Valle del Cauca en Colombia. Adicionalmente, aquí se considera a *Columnea archidonae* como variedad de *C. ericae*. *Columnea ericae* var. *archidonae* se distribuye en Colombia y Ecuador, en bosques de mayor altura que aquellos en los cuales se encuentra la variedad típica.

Palabras clave. *Columnea chocoensis*, *Columnea stilesiana*, *Columnea ericae*, Gesneriaceae, Chocó Biogeográfico.

INTRODUCTION

Taxonomic novelties and nomenclatural changes have arisen during the process of studying material for the taxonomic revision of *Columnea* L. section *Collandra* Lem. (Benth.) (Gesneriaceae). *Columnea* is the most diverse genus of the neotropical Gesneriaceae with more than 205 species (Möller & Clark 2013), and more than 80 species in Colombia, with the Chocó biogeographical region contributing ca. 44% of that diversity (Rangel-Churrio & Rivera-Díaz 2004); recent reports of new species for this region (see Amaya-Márquez *et al.* 2015) as well as the new species that we report here, support this geographic patterns of diversity. Recent molecular studies have shown that *Columnea* is a monophyletic group, while the subgeneric classification is not fully supported (Smith *et al.* 2013). In this paper two species of *Columnea*, *C. stilesiana* and *C. chocoensis*, as well as the variety *C. chocoensis* var. *altaquerensis* are reported new for science; the taxonomical placement of these species in section *Collandra* is discussed. An examination of *Columnea ericae* Mansf. indicates a wider intraspecific morphological variation, as well as a wider range of geographical distribution for this species. Therefore, a new variety of *C. ericae* Mansf. is recognized.

MATERIALS AND METHODS

Herbarium specimens (101) were examined under a binocular microscope (Nikon SMZ-1) using lens 33×/6, *Columnea chocoensis* var. *chocoensis* (4), *C. chocoensis* var. *altaquerensis* (11), *C. ericae* var. *ericae* (46), *C. ericae* var. *archidonae* (28), and *C. stilesiana* (12). The full descriptions of the species follow the traditional taxonomic procedure (*i.e.*, Winston 1999) which comprises: protologue including synonymy when necessary, etymology, phenology, geographical distribution, representative specimens, and distinctive characters.

RESULTS AND DISCUSSION

Columnea chocoensis M. Amaya & L.E. Skog, **sp. nov.** (Figures 1 and 2).

TYPE: COLOMBIA: Chocó: Municipio de San José del Palmar, vereda San Antonio, Escuela San Antonio, 4°52'N, 76°13'W, 1650 m, 13 May 2011, *Marín-Gómez, O. H. & D. A. Gómez-Hoyos* 77 (Holotype: COL; isotype: US).

Columnea chocoensis differs from any other known *Columnea* by having a long, dorsally recurved tubular corolla with a narrow bilabiate limb, and exerted stamens and style.

Terrestrial suffrutescent, 0.2-1 m tall. Stem green, terete, densely golden pilose; internodes 1.8-3.5 cm. **Leaves** opposite, strongly anisophyllous in a pair, papyraceous to chartaceous. Larger leaf sessile; blade asymmetric, narrowly oblong to lanceolate, 11.5-16 × 3.2-4.5 cm, base slightly oblique, cordate, apex acuminate, margin serrate, irregularly spaced, adaxially dark green, glabrous, except on the margin where it is pilose (5-10-celled trichomes), abaxially pale green, red at the apex, or at the apex and at the apical margin above the middle, pilose, more dense on the veins (10-celled trichomes), 15-16 veins on the larger side of the blade. Smaller leaf sessile; blade asymmetric, lanceolate, 2.0-3.2 × 0.4-0.6 cm, base oblique, apex long attenuate, margin serrate, adaxially glabrous, except on the margin, abaxially densely pilose (5-10-celled trichomes). **Inflorescence** reduced to one flower in the axil of the larger leaf in each pair; two bracteoles 0.4-0.6 × 0.1-0.2 cm, pale yellow, lanceolate, totally covered on both sides with trichomes 0.7-0.8 cm long. **Flowers** pedicellate, pedicels apically swollen, 3-3.2 cm long, densely pilose and with sparsely glandular trichomes. **Calyx** yellow, sepals free, subequal, lanceolate, 2.3-2.5 × 0.3-0.4 cm, adaxially glabrous, abaxially pilose (7-10-celled trichomes) and with sparsely

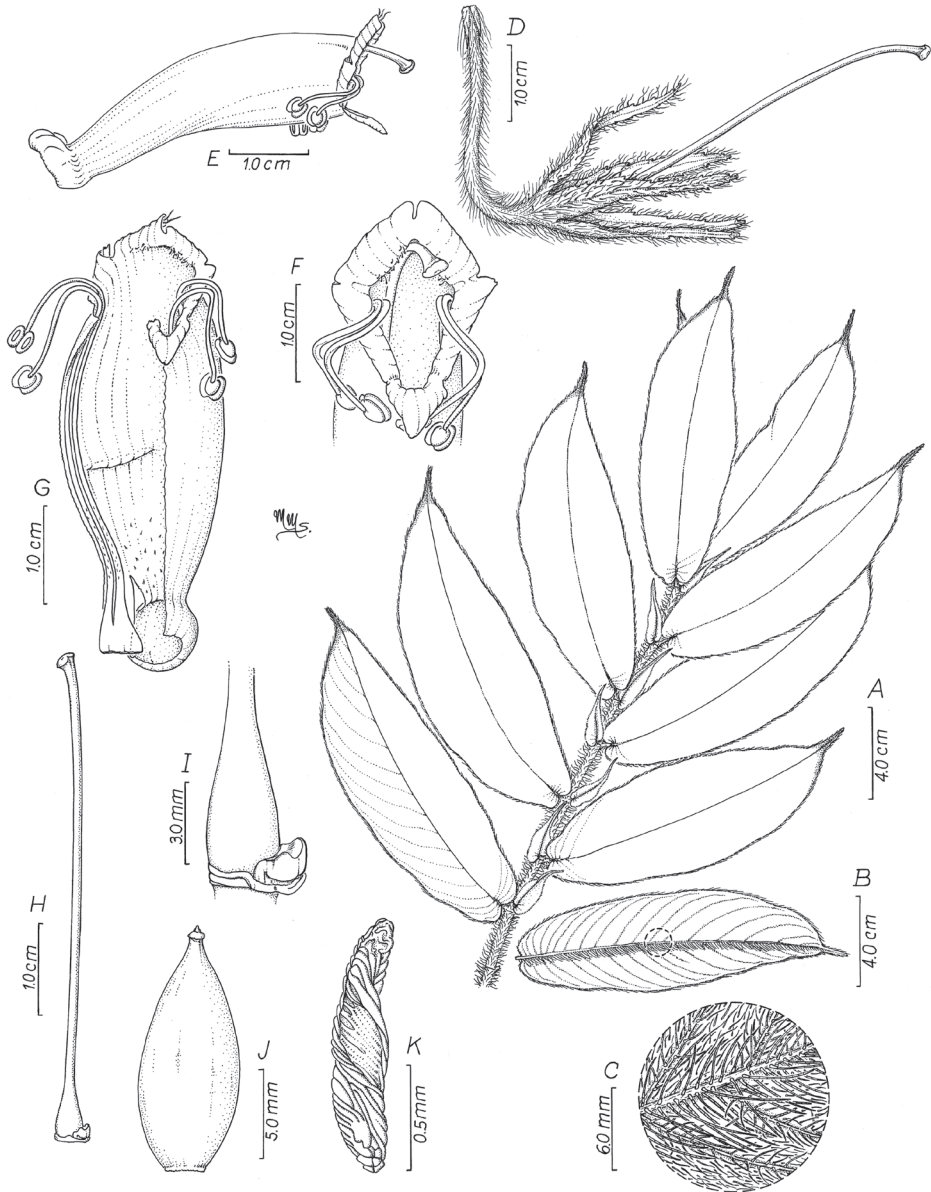


Figure 1. *Columnea chocoensis* M. Amaya & L.E. Skog var. *chocoensis*

A. Habit. **B.** Abaxial side of the larger leaf at a pair showing the veins. Note the base is slightly oblique and cordate, and the indumentum is denser toward one of the sides along the main vein. **C.** Detail of the abaxial indumenta. **D.** Bracts, pedicel, and calyx. Note the style is oblique to the ovary. **E.** Corolla of a flower in the female phase with the stamens pulled along the corolla tube. Note the limb is bilabiate and oblique. **F.** Frontal view of the corolla limb showing the zygomorphic symmetry, the two dorsal and the two lateral lobes markedly revolute form the upper lip, and the ventral lobe forms the lower lip with a tuft of trichomes located in the sinuses between the two dorsal lobes. **G.** Opened corolla showing the 2-3 celled-trichomes located toward the base inside. **H.** Pistil and nectary. **I.** Enlargement of the ovary and nectary. **J.** Young berry fruit. **K.** Seed. A-I based on *Marín-Gómez & Gómez-Hoyos 77* (COL), J-K based on *Ramos et al. 1199* (CUVC).

glandular trichomes, margin dentate, 6 teeth per side. **Corolla** yellow, slightly oblique in the calyx, tube dorsally recurved, 4.7 cm long on the larger side (dorsal) and 3.7 cm long

on the shorter side (ventral), 1.3 cm wide at the wider part before the limb, 1.7 cm at the limb, basally constricted to 0.4 cm wide, base dorsally gibbous, gibbosity 0.4×0.8 cm; limb

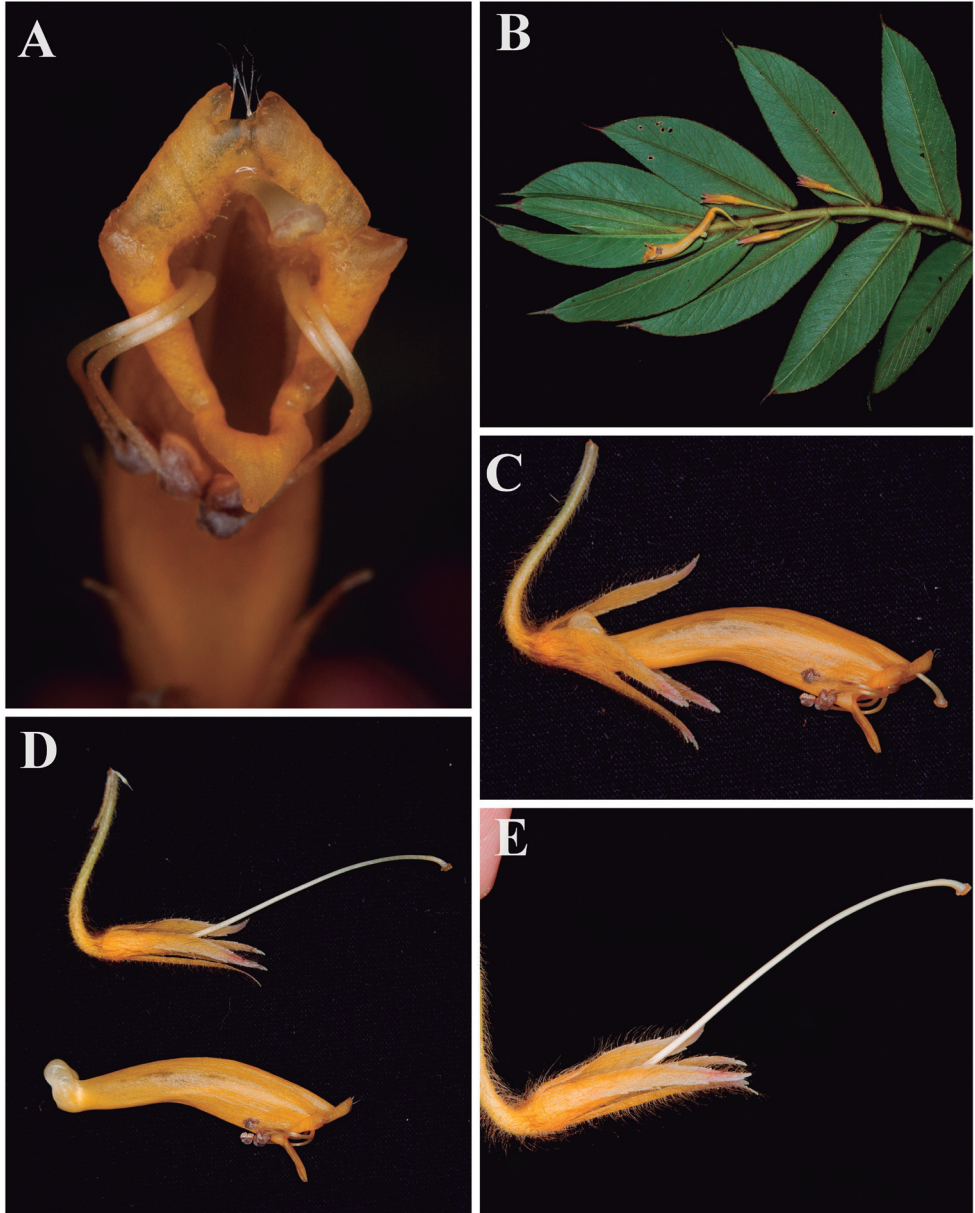


Figure 2. *Columnnea chocoensis* M. Amaya & L.E. Skog var. *chocoensis*. **A.** Bilabiate corolla limb. **B.** Ventral view of the vegetative and reproductive shoots. **C.** Lateral view of the flower. **D.** Pedicel with bracteole, with the style oblique to the calyx, and corolla tube dorsally curved, with the base dorsally gibbous. **E.** Indument of pedicel and calyx, and the stomatomorphic stigma.

oblique, bilabiate, upper lip formed by the two dorsal and two lateral rounded and revolute lobes, 0.7×0.4 cm, ventral lobe very wide, oblong, 0.7×0.4 cm; corolla outside glabrous, except for a few long trichomes on the sinuses between the two dorsal lobes, inside sparsely pilose (2-3-celled trichomes), apically densely glandular between the two dorsal lobes, and more sparse on the other lobes. **Androecium** of 4 exerted stamens, filaments 5-5.5 cm long, apically glabrous, basally pilose, connate at base for 0.4 cm forming a staminal blade; anthers dorsally subquadrate, 2×2.5 mm. **Gynoecium** with ovary conic, $5-6 \times 2.5-3$ mm, glabrous; style 4.5 cm long, glabrous, stigma stomatomorphic. **Nectary** of two dorsal connate glands, 4.0×1.5 mm. **Fruit** a pale yellow, pointed berry, 1.2×0.6 cm. **Seeds** brown, 1.2×0.2 mm, obliquely striate.

Etymology: The species epithet refers to the Chocó Biogeographical Region, where the species is distributed in Colombia.

Phenology: Flowers have been recorded from a specimen collected in May, and fruits from another specimen collected in August.

Distribution: Colombia (Valle del Cauca, Chocó) at 1650-1800 m alt.

Paratype: COLOMBIA. **Chocó:** Municipio San José del Palmar, vereda Río Negro, Cerro Torrá, near the heliport, 12 Aug. 1988, 1800 m, Ramos, J. E. *et al.* 1199 (CUVC, US).

Distinctive features: *Columnea chocoensis* is easily recognized by presenting the following characteristics: the plant is terrestrial of 0.2-1 m height, its shoots extended horizontally in a similar way to the climber conspecifics. The plant has long trichomes, especially on the stems and on the abaxial surfaces of the leaves (Figures 1A, 1C), however, the trichomes are absent on the adaxial face, except for a ca. 2 mm wide border along the margin where the trichomes are abundant and homogeneously

distributed. The inflorescences are reduced to solitary flowers located in the axil of the larger leaf, the bracteoles may not be seen by the casual observer, due to their reduced size (0.4×0.2 cm), and because they are totally covered on both sides by trichomes 0.7-0.8 cm long (Figure 1D). The corolla is yellow, slightly oblique in the calyx, long, narrow and bilabiate (Figures 2C); the four lobes of the upper lip are revolute, and the ventral lobe is very broadly oblong, with anthers and stigma exerted from the corolla (Figures 2A). Usually the bilabiate corollas in *Columnea* are wide at the limb and the upper lip is formed by two lobes, while in *C. chocoensis* the limb is almost as narrow as the rest of the corolla tube, and the upper lip is formed by four lobes, giving to the corolla a distinctive aspect that helps to distinguish this species from other species within the genus.

We recognized two varieties of *Columnea chocoensis*. The typical variety is restricted to the Chocó and Valle del Cauca Departments in Colombia, while the second variety (below) is distributed southern, in the Nariño Department. The three departments make up part of the Chocó Biogeographical region.

Columnea chocoensis M. Amaya & L.E. Skog **var. altaquerensis** L.E. Skog **var. nov.** (Figure 3).

TYPE: COLOMBIA: Nariño: Municipio de Barbacoas, corregimiento Altaquer, vereda El Barro, Natural Reserve Río Ñambí, trail around **Río Peje, 1400-1500 m**, 24 July 2011, *Clavijo, L. & J. Goyes* 1657 (Holotype: COL; isotype: US).

Differs from the typical variety by having: (1) the adaxial face of leaves hispid (vs. glabrous); (2) a larger and asymmetric red spot on the lower side of the larger leaf, which as a whole forms a red “margin” of the shoot (Figure 3A); (3) a shorter pedicel 2.0-2.2 cm (vs. 3.0-3.2 cm); (4) bracteoles with a medial red line on the abaxial side (Fig. 3D); (5)

sepals 1.9-2.1 × 0.2-0.3 cm (vs. 2.3-2.5 × 0.3-0.4 cm), (6) corolla 4.1 cm long (vs. 4.7 cm in the typical variety); (7) smaller nectary 1.5 × 1.5 mm (vs. 4.0 × 1.5 mm); and (8) a bifid stigma (vs. stomatomorphic) (Fig. 3G). **Etymology:** The name refers to Altaquer

where the Natural Reserve of the Ñambí River is located (Department of Nariño, Colombia), and acknowledges the efforts made by local people to preserve the natural patrimony and the high biological diversity harbored in the area.

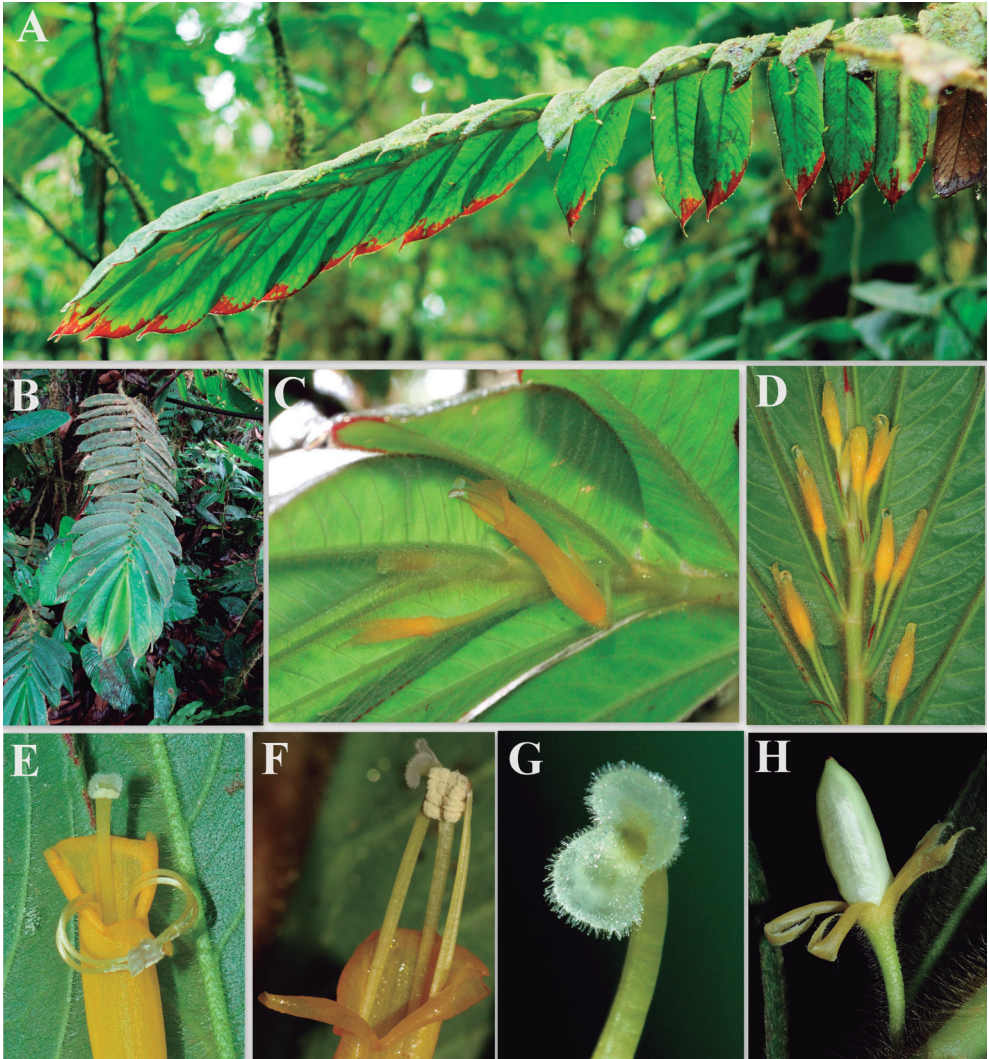


Figure 3. *Columnea chocoensis* M. Amaya & L.E. Skog var. *altaquerensis* L.E. Skog. **A.** Ventral view of the vegetative shoot, the red apex of each leaf appears like a “margin” for the whole vegetative shoot. **B.** Dorsal view of the vegetative shoot. **C.** Flowers hidden under the leaves with the pedicel perpendicular to the corolla. **D.** Flowers in the bud stage with pedicels erect in the calyx. Note the bracteoles with a medial red line. **E.** Flower at the female phase. **F.** Flower at the male phase. **G.** Bifid stigma. **H.** Young fruit.

Phenology: Flowers have been recorded on the specimens collected in March, July, and August.

Distribution: Colombia (Nariño) at 1100-1500 m, in premontane pluvial forests.

Representative specimens: COLOMBIA.

Nariño: Municipio Barbacoas, Corregimiento Altaquer, vereda El Barro. Natural Reserve Río Ñambí, 1°18'N, 78°8'W, 1325 m, *Franco, P. et al. 4942* (COL); 1100-1400 m, *Salinas, N. R. et al. 317* (COL); 1350-1400 m, *Pipoly, J. et al. 21325* (PSO, CUVC); 1250-1350 m, *Pipoly, J. et al. 21586* (PSO), 1325 m, *Betancur, J. et al. 4384* (COL); 1°19'N, 78°05'W, 1300 m, *Arias, J. C. 107* (PSO); 1°17'37.5"N, 78°5'44.7"W, 1350 m, *Marín-Gómez, O. H. 265* (MO), *298* (COL).

Columnnea chocoensis var. *chocoensis* and var. *altaquerensis* both exhibit the floral mechanism of dynamic herkogamy associated with protandry, which is known to occur in other species of *Columnnea* (Morley 1974; Amaya-Márquez ined.). At the end of the male phase, the filaments usually coil and pull the anthers inside at the base of the corolla, creating an efficient physical separation between the female and male parts. After anthesis in both varieties of *C. chocoensis* the stamens are no longer functional and they bend down remaining outside the corolla (Figure 3E). *Columnnea chocoensis* var. *altaquerensis* has been more widely collected than the typical variety, however all the collections come from the Natural Reserve Río Ñambí, suggesting that this variety might be endemic to the region, or that more botanical exploration is required in the Nariño and Cauca departments.

Columnnea stilesiana M. Amaya & L.P. Kvist **sp. nov.** (Figures 4 and 5)

TYPE: COLOMBIA. Valle del Cauca: Limit between the municipalities of El Cairo and San José del Palmar; sector La Florida, trail

Los Santicos-La Florida, Natural Reserve Cerro del Inglés. 4.74°N, 76.29°W, 2177 m, 20 May 2013, *Smith, J. F. et al. 10817* (Holotype: COL; isotypes: US, SRP).

Columnnea stilesiana differs from *C. ericae* Mansf. by the absence of bracts (having only a pair of tiny, caduceus bracteoles), larger pedicels, and larger, violet-magenta corollas.

Suffrutescent climber. Stem sub-terete, apically canaliculate, 0.3-0.8 cm diam., indument sericeous with sparsely setulose, white unicellular trichomes; internodes 1.4-5 cm long. **Leaves** opposite, strongly anisophyllous in a pair, membranous, less often papyraceous. Larger leaf sessile; blade asymmetric, oblanceolate to narrow oblong, 13.5-25 × 2.9-5 cm, base oblique, apex long acuminate, margin dentate, adaxially green, sericeous, sometimes with sparsely white setulose (1-2-celled trichomes); abaxially totally reddish with deep purple on almost 1/2 of the apical foliar area, sericeous, trichomes more dense on the veins; 10-11 veins on the larger side of the blade. Smaller leaf sessile; blade asymmetric, lanceolate, 1.4-2.2 × 0.2-0.3 cm, base oblique, apex long acuminate, margin serrate, adaxially green, sericeous, abaxially reddish, sericeous. **Inflorescence** reduced to 1, rarely 2 flowers in the axil of the larger leaf; bracteoles 2, unequal, 3.5-8 × 1 mm, densely sericeous on both faces, caducous. **Flowers** pedicellate, pedicel 3.8-4.7 cm long, sericeous. **Calyx** pale green, sepals nearly free, the lobes connate basally for 1-2 mm of their length, subequal, lanceolate, 1.9-3 × 0.2 cm, adaxially sericeous, abaxially densely sericeous, margin dentate, 6 teeth per side. **Corolla** purple-magenta, basally white; tube sigmoid and dorsally curved, 6-7.6 cm long, 1.4-1.6 cm wide at the widest part (which coincides with the corolla apex where the ventral lobe originates); basally gibbous, gibbosity 0.6-1 × 0.2-0.4 cm; limb bilabiate, oblique, upper limb formed by the two dorsal lobes (which form an ample galea)

and the two lateral triangular lobes, the ventral lobe 1.8-3 × 0.1-0.3 cm; corolla outside translucent sericeous, inside sparsely pilose (4

celled-trichomes), the limb densely glandular (2-4-celled trichomes plus the glandular head). **Androecium** of 4 stamens, filaments 5.2-6.1

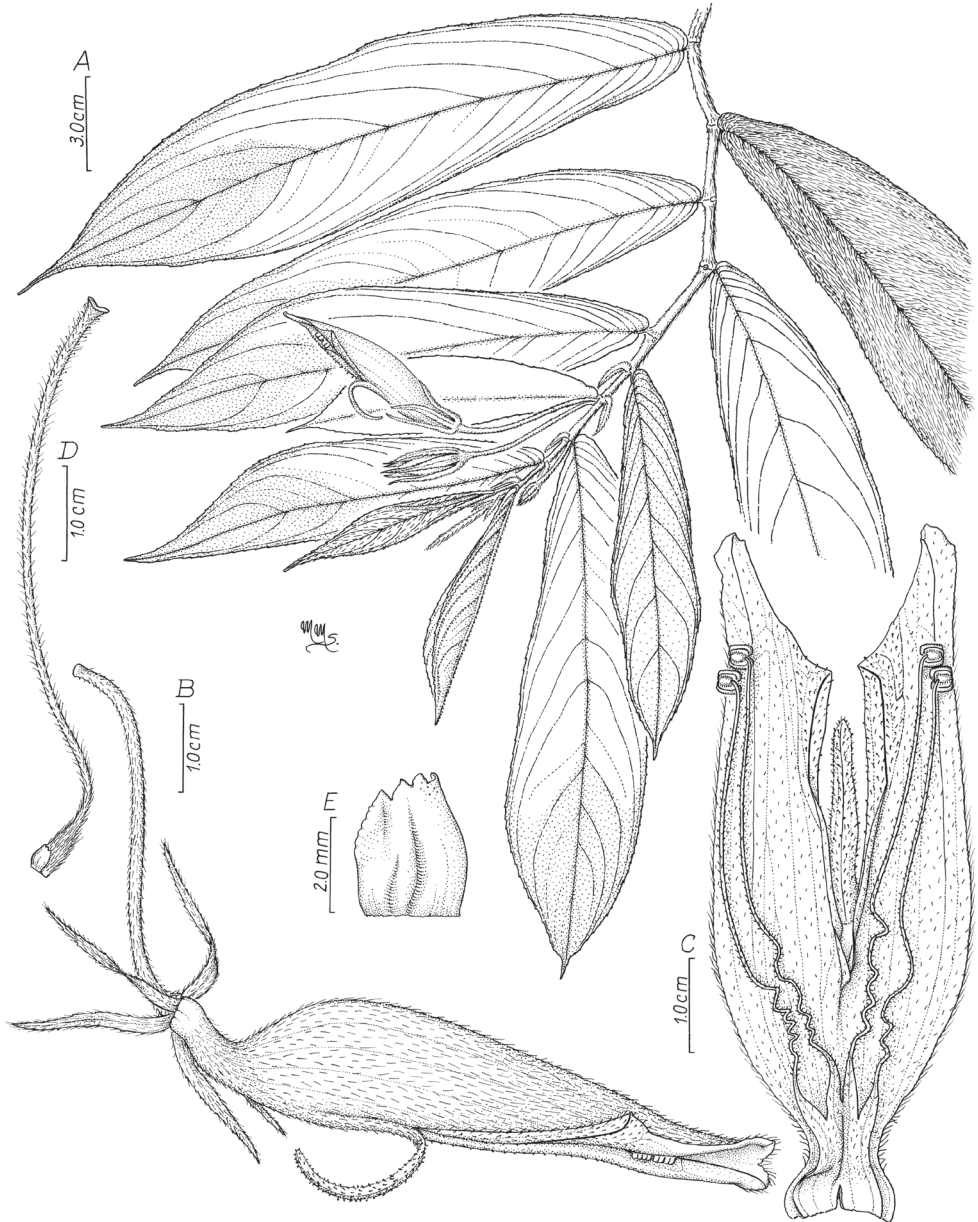


Figure 4. *Columnnea stilesiana* M. Amaya & L.P. Kvist. **A.** Habit. **B.** Lateral view of the flower showing the corolla limb bilabiate and with galea. **C.** Corolla dissected to show internal surface pilose, and androecium. **D.** Pistil and basal nectary. **E.** Detail of the nectary. (Based on Smith, J. F. et al. 10817 - COL).

cm long, hairy along their length and basally connate for 1 cm forming a staminal blade folded and open dorsally; anther 2×1.9 mm, connective subquadrate, basally sagittate, thecae elliptic with longitudinal dehiscence. **Gynoeceum** with ovary conic, 0.8×0.2 cm, densely sericeous; style laminar, 5.4-6.2 cm long, densely pilose, with uniseriate and glandular trichomes (2-6-celled plus glandular head), more dense apically; stigma bilobulate and recurved, papillate. **Nectary** of one dorsal tridentate or tetridentate gland, 3×2.5 mm, less often two dorsal bidentate glands, 2×1 mm each. **Fruit** a white, ovoid berry, 2.2×0.9 cm. **Seeds** light brown, darker at the ends, elliptic, obliquely striated, 1.3×0.8 mm.

Etymology: The species epithet honors Frank Garfield Stiles, an eminent scientist who has contributed enormously to the understanding of the ecology of tropical birds, particularly to the study of neotropical hummingbird, which are pollinators of the species of *Columnea*. Dr. Stiles is an excellent professor who has contributed to the education of several generations of biologists at the Universidad Nacional de Colombia. In the past the senior author was one of those fortunate students.

Phenology: *Columnea stilesiana* has been recorded with flowers in January, February, March, May, and August.

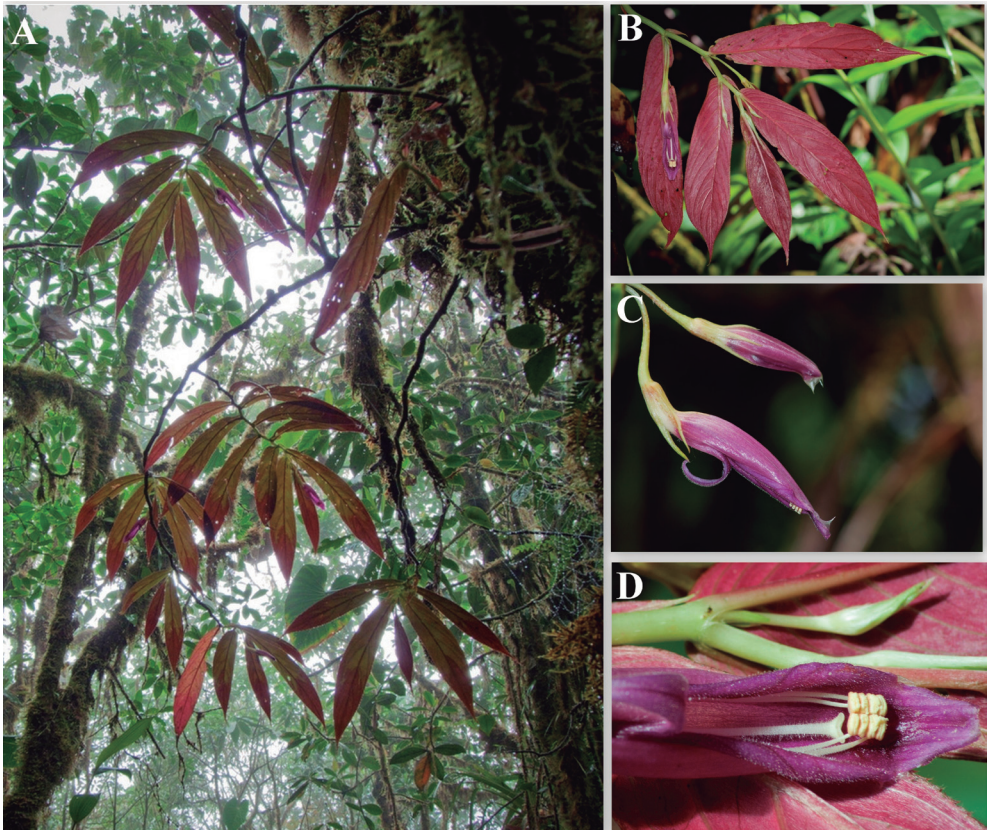


Figure 5. *Columnea stilesiana* M. Amaya & L.P. Kvist. **A.** Branched dorsiventral vegetative shoot. **B.** Ventral view of the vegetative shoot. **C.** Bud and lateral view of an open flower. **D.** Corolla limb bilabiate and with galea.

Distribution: This species is distributed in the Colombian Biogeographical Chocó Region (Departments of Chocó and Valle del Cauca) in forest located between 1600-2300 m alt.

Representative specimens: COLOMBIA. **Chocó:** San José del Palmar, Carretera Ansermanuevo-San José del Palmar. Alto de Galápagos, 2000 m, *Forero, E. et al. 2846* (COL, MO, US); Vereda el Corcovado, finca Ayaconas, 2140 m, *Franco, P. et al. 1591* (COL); Cerro del Torrá, eastern slopes of Río Negro, vereda del río negro, near heliport, 1630 m, *Ramos, J. E. et al. 1056* (CUVC, US); **Valle del Cauca:** El Cairo, vereda El Brillante, Reserva comunitaria Cerro El Inglés, 4°44'N, 76°18'W, 2200-2300 m, *Marín-Gómez, O. H. et al. 7* (COL); 4°45'N, 76°17'W, *Marín-Gómez, O. H. et al. 181* (COL); vereda El Brillante, Cordillera Occidental, Serranía de Los Paraguas, Natural Reserve La Fontana, *Montoya-Dossman, D. 102* (CUVC); Corregimiento El Boquerón, vereda El Brillante. Natural Reserve Cerro El Inglés, trail to the place La Florida by the Alto Los Santicos, 4°45'28.1"- 4°46'37" N, 76°18'3.4"-76°18'26.1" W, 1710-2210 m, *Clavijo, L. et al. 1706* (COL, US, CUVC).

Columnnea ericae Mansf., Repert. Spec. Nov. Regni Veg. 36: 123. 1934, **var. ericae**. *Dalbergaria ericae* Wiehler, Phytologia 27: 317. 1973.

TYPE: ECUADOR: Napo: Tena, Hacienda Dos Ríos, 700 m, 8 Apr. 1933, *Heinrichs, E. 323* (Holotype: B, no longer extant); ECUADOR: Napo: Río Wai Si Ayá, a northern tributary to Río Aguarico, 1.5 km up the river on a small path going in direction SE, 0°15'S, 76°21'W, 300 m, *Brandbyge et al. 32643* (Neotype: AAU; isoneotype: US designated by Kvist & Skog, Allertonia 6: 355, 1993). (Figures 6 and 7).

Suffrutescent vine. Stem green, subterete, 0.6-1.3 cm in diam., canaliculate, sericeous

(5-12-celled trichomes), glandular on the nodes; internodes 0.7-3.0 cm long. **Leaves** opposite, strongly anisophyllous in a pair, papyraceous. Larger leaf sessile or shortly petiolate, petioles 0.1-0.3 cm long, sericeous; blade asymmetric, oblanceolate to narrow oblong, 8.5-27.0 × 2.8-7.6 cm, base oblique, apex acuminate, margin serrate, adaxially green, sericeous (5-10-celled trichomes) with sparse setulose, white unicellular trichomes, abaxially green or reddish, red or deep purple in the apical 1/3 or 1/5 of the foliar area, sparsely sericeous and more dense on the main veins, 11 (rarely 7-14) veins on the larger side of the blade. Smaller leaf sessile; blade asymmetric, lanceolate, 1.0-3.5 × 0.2-0.8 cm, base oblique, apex acuminate, margin serrate, adaxially green, sericeous (5-10-celled trichomes) with sparse white, setulose trichomes, abaxially green, sparsely sericeous (5-7-celled trichomes) with sparse white setulose trichomes. **Inflorescence** fasciculate (cymose), with 1-3 flowers in the axil of the larger leaf; bracts 2-5, yellow, lanceolate, 0.8-2.3 × 0.1-0.6 cm, sericeous on both faces. **Flowers** pedicellate, pedicels 0.6-3.8 cm long, densely golden-sericeous (10-14-celled trichomes). **Calyx** pale green, yellow, or yellow with a red midline on each sepal; sepals free, unequal, lanceolate, 1.7-3 × 0.3-0.4 cm, adaxially and abaxially sericeous, margin dentate with 3-4 tiny teeth per side. **Corolla** yellow with two deep purple vertical stripes along both sides of the ventral lobe, tube sigmoid, 5-7 cm long, constricted at base to 0.5 cm, base dorsally gibbous, gibbosity 0.4 × 0.3 cm; 1.0-1.1 cm wide at middle and throat, 1.3 cm wide at limb, the limb bilabiate and oblique, the upper lip formed by the two dorsal and the two lateral lobes, 1.5-1.8 × 1.5-1.8 cm, the lower lip formed by the ventral lobe, 1.0-2.8 × 0.2-0.4 cm, corolla outside densely sericeous (5-10-celled trichomes), inside pilose, glandular on the limb on all five lobes (2-3-celled uniseriate trichomes with a glandular apical head). **Androecium** of 4 stamens, filaments laminar, 4-4.5 cm long,

pilose along their length, basally connate for 0.5 cm forming a staminal blade; anthers quadrate, 0.2×0.2 cm. **Gynoecium** with ovary oblique to the style, conic, 0.5×0.2 cm, densely sericeous; style laminar, pilose with simple and glandular trichomes, 4.2- 4.5 cm long; stigma bilobate. **Nectary** of one dorsal bidentate- or tridentate-gland, 0.2×0.3 cm. **Fruit** a berry, 1.3×1.2 cm. **Seeds** amber-colored, 0.2×0.1 cm, obliquely striated.

Etymology: The species name ‘*ericae*’ honors the collector of the holotype, Miss Erica Heinrichs, who collected plants in Ecuador during the 1930s.

Phenology: The examined specimens show that this species produces flowers all year round; fruits were recorded on a specimen collected in June.

Distribution: *Columnnea ericae* has been collected mainly in the lowland rain forest in the plains of the Amazon Basin, and also in the Andean piedmont in southeastern Colombia (Amazonas, Caquetá, Putumayo, Vaupés) at 90-1000 m alt., eastern Ecuador (Morona-Santiago, Napo, Pastaza, Tungurahua, Zamora) at 270-2200 m alt., and eastern Peru (Amazonas, Cajamarca, Huanuco, Loreto, Pasco, San Martín) at 100-1650 m.

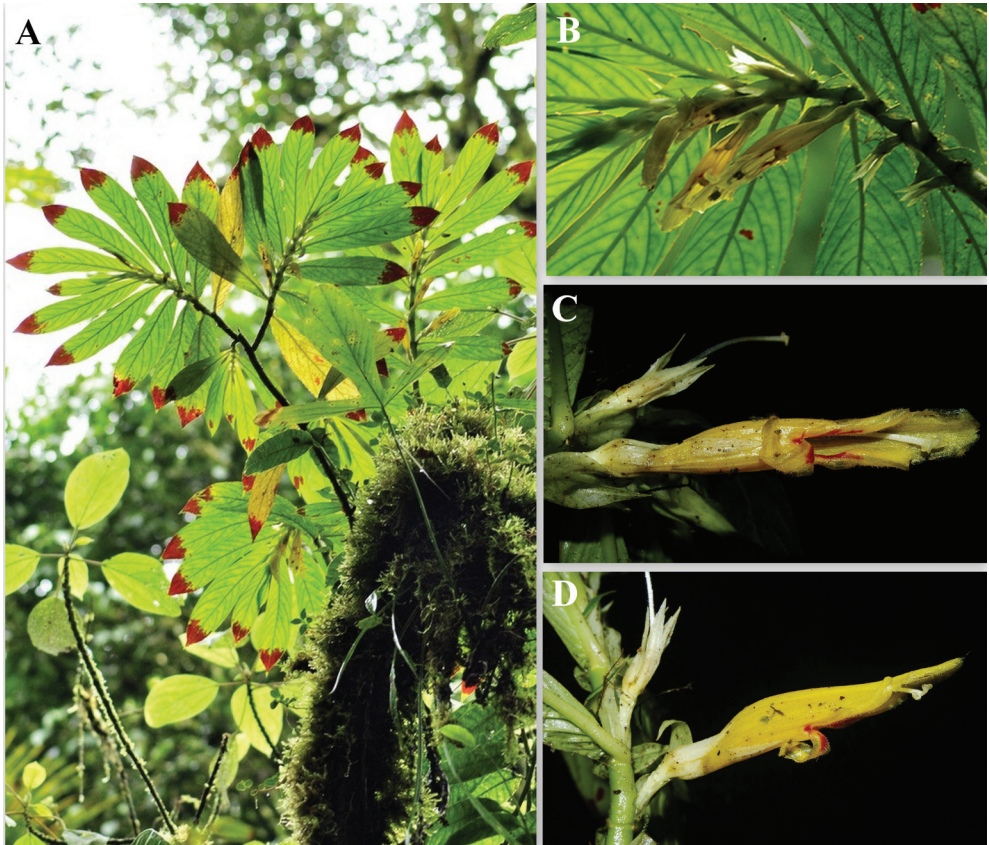


Figure 6. *Columnnea ericae* Mansf. var. *ericae*. **A.** Vegetative shoot. **B.** Axillary inflorescences located underneath the vegetative shoot. **C.** Bracts pale yellow and corolla bilabiate with two purple lines delimiting the entrance of the corolla. **D.** Lateral view of the flower.

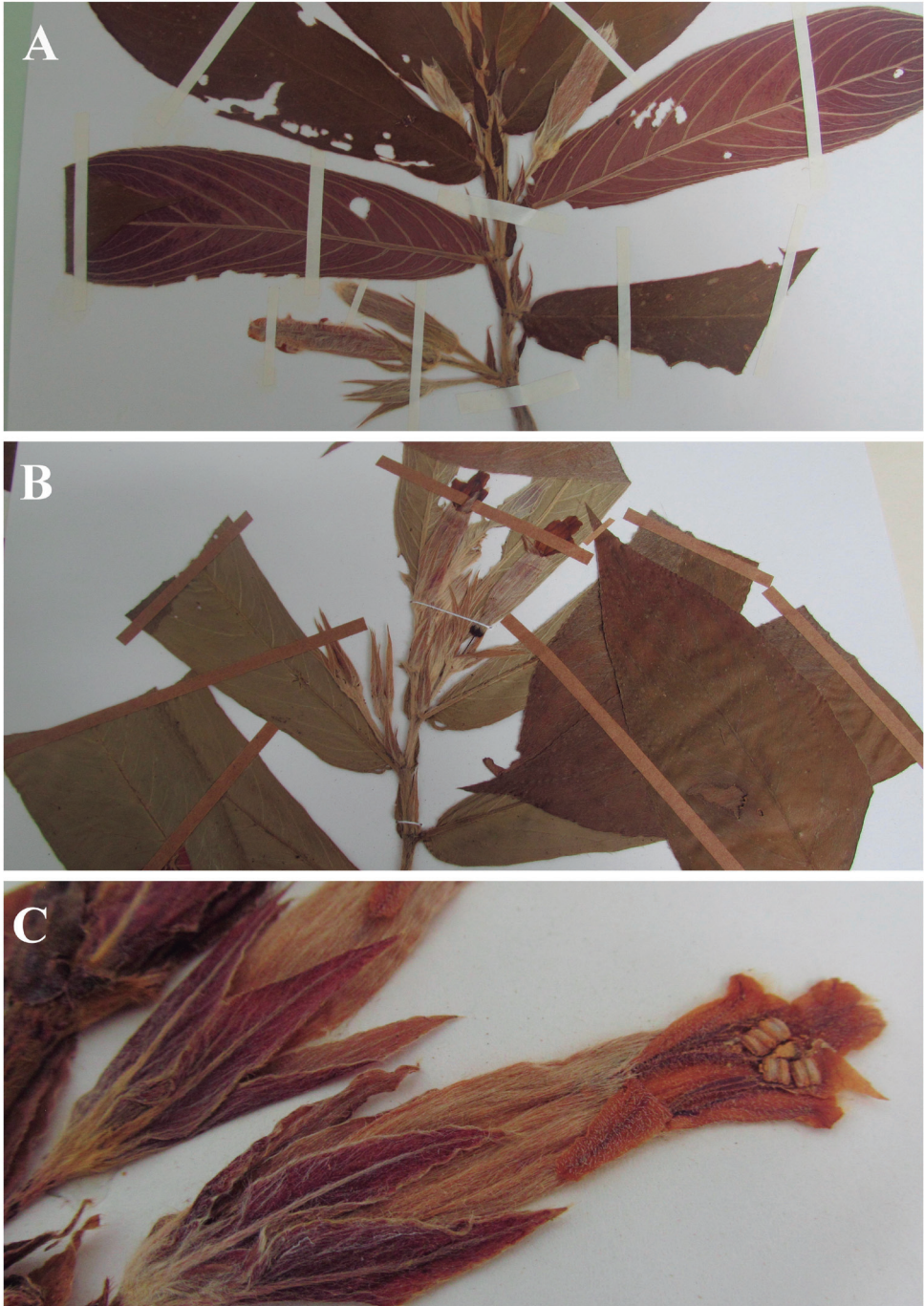


Figure 7. *Columnnea ericae* Mansf. var. *ericae*. **A.** Leaves abaxially sericeous and denser on the secondary veins. **B.** Adaxial face of the larger leaves. **C.** Corolla erect in the calyx, with outside densely sericeous, and limb bilabiate.

Representative specimens: COLOMBIA.

Amazonas: Between rivers Putumayo and Purité, 3°32'9.8"S, 69°53'27.26"W, *Guataquirá S. et al. 13* (COL); P.N.N. Amacayacu, Río Amacayacu, trail San Martín-Cotué before Caño Aguapudré, 90 m, *Pinilla, N. et al. 323* (COL); Río Amacayacu 20 km de son embouchure sur l'Amazone, maloca Impata, *Sastre, L. G. & R. Echeverry 565* (COL, P). **Caquetá:** 21 km from Florencia towards Altamira, 915 m, *Luteyn, J. et al. 4949* (COL, NY, SEL); 28 km E of Morelia toward Río Pescado, 260 m, *Gentry, A. et al. 9084* (COL, MO); Cordillera Oriental, eastern slope, bank of Río Hacha, 1000 m, *Cuatrecasas, J. 9004-A* (COL); Florencia-Guadalupe road, km 21, 670 m, *Londoño, X. & L. P. Kvist 129* (COL, US); Florencia-Guadalupe road, km 26, 750 m, *Londoño, X. & L. P. Kvist 150* (COL, US); Solano, bank of Río Mesay. Estación Puerto Abeja, sector sur-oriental P.N.N. Chiribiquete, 0°4'27"N, 72°27'5"W, *Rosero, L. 143* (COL). **Putumayo:** Orito, Vereda San Andrés, forest on the right side of the road from Orito to inspección Tesalia, 0°40'30"N, 76°45'30"W, 410 m, *Rodríguez, N. et al. 793* (COL); vereda El Libano, predio Umiyac, 00°40'53.8"N, 77°2'7.2"W, 775-850 m, *Giraldo, I. et al. 165A* (COL); Puerto Porvenir, arriba de Puerto Ospina, hacia la Loma, 230-250 m, *Cuatrecasas, J. 10628* (COL, F, US); Slopes and road sides along road from Mocoa to Pto. Asís at km 27, 670 m, *Luteyn, J. et al. 5061* (COL, NY). **Vaupés:** Forest between Apaporis and Vaupés rivers, path from Puerto Naré to Victoria, 300 m, *Schultes, R. E. 5361* (COL, F, GH, US). ECUADOR. **Pichincha:** Mission Shandia, Jatun Yaku river, *Barclay, H. G. 4986* (COL); Reserva Florística-Ecológica Río Guajalito, km 59 on the old road Quito-Sto. Domingo de los Colorados, 3.5 km NE of the road. Eastern slopes of Volcán Pichincha, 0°13'53"S, 78°48'10"W, 2200 m, *Grijalva, E. 304* (MO); **Morona-Santiago:** Tiwintza, region of the Cordillera

del Condór. Center Shuar Kaputna, S. of Río Santiago, 3°1'10"S, 77°55'31"W, 270 m, *Kajekai, C. 1080* (MO); from Macas across Río Upano for about 15 km and then a 5 km hike by foot into the Cordillera de Cutucú, after 2.5 km across a river via steel basket on a cable, then another 2.5 km upward, *Wiehler, H. et al. 8817* (US); Gualaquiza-Indaza, km. 20 between Túmbez and Tucumbatza, 1600 m, *Harling, G. & L. Andersson 24388* (GB, SEL, US); San Juan Bosco road between San Juan Bosco and El Pangui, 2-3 km S of San Juan Bosco, 3°8'36"S, 78°32'13"W, 1291, *Clark, J. L. et al. 9872* (AAU, COL, MO, NY, QCNE, SEL, UNA, US). **Napo:** Archidona, Ribera del Río Alpayacu, Bloque 19, línea sísmica 22, Helipuerto 6 Compañía Triton, 0°52'S, 77°24'W, 480 m, *Vargas, H. & P. Grefa 857* (US); Loreto, National Park Sumaco, matorral de bambú, bloque 19, línea sísmica 22, compañía Triton, 0°47'S, 77°28'W, 500 m, *Freire, E. & J. Cerda 229* (US); Río Wai Si Ayá, 5 km upstream from the outlet in Río Aguarico, 0°15'S, 76°21'W, 300 m, *Brandbyge, J. et al. 33370* (AAU, US); Río Cosanga, 1920 m, *Boeke, J. D. & J. B. McElroy 410* (NY, SEL, US). **Pastaza:** Motolo, in the vicinity of Shell-Mera (Pastaza), *Lugo, H. 690* (SEL, US); Vicinity of Puyo, eastern foot-hills of the Andes, 750-1000 m, *Skutch, F. 4418* (A, F, GH, MO, NY, US); Vicinity of Shell, ca. 1 km, 0°29'39"S, 78°3'52"W, 1085 m, *Croat, T. B. & L. Hannon 87061* (MO); Pozo Villano, 2 km from Arco 2 km from town Villano, 1°25'S, 77°20'W, 400 m, *Tipaz, G. et al. 576* (US). **Tungurahua:** Cantón Baños, Parroquia Río Negro, locality near Río Topo, 1°23'8.7"S, 78°10'1.2"W, 1400 m, *Clark, J. L. & V. Duran 6006* (AAU, COL, QCA, QCNE, US); Baños, Parroquia Río Verde, sector Machay, along forested trail (from Baños-Puyo road) toward Cascada de San Miguel via San Agustín, 1°23'5"S, 78°16'50"W, 1800-2200 m, *Clark, J. L. et al. 5697* (AAU, COL, K, NY MO, QCA, QCNE, US). **Zamora-Chinchipe:** Jamboue

Bajo, Eastern border of Podocarpus National Park, 4°5'S, 78°55'W, 1100 m, *Clark, J. L. et al.* 3292 (AAU, COL, E, GB, LOJA, MO, NY, QCNE, SRP, US); Vicinity of Tandaiame, above the junction of Condor Mirador, sandstone plateau of Cordillera del Condor, 3°35'54"S, 78°29'14"W, 1420 m, *Croat, T. M. & G. Ferry* 98854 (MO). PERU. **Amazonas**: Bagua, Aramango, trail Nueva Esperanza-Catarata, 5°29'54"S, 78°20'00"W, 1650 m, *Vásquez, R. et al.* 27349 (MO). **Cajamarca**: San Ignacio, Huarango, poblado Selva Andina, road leading to the "captación de agua", 5°3'50"S, 78°43'19"W, 2378 m, *Perea, J. et al.* 3818 (MO). **Huanuco**: Pachitea, Codo de Pozuzo, alluvial fan floodplain of Río Pozuzo after it emerges from mountains, 9°40'S, 75°25'W, 450 m, *Foster, R.* 9184A (MO, USM). **Loreto**: Maynas, Explornapo Camp, Inventario McArthur, near Sucusari, along river Napo, 3°20'S, 72°55'W, 100-140 m, *Pipoly, J. et al.* 13048 (COL, MEXU), 14009 (COL); Ravine Paparo, tributary of Río Manatí, 3°45'S, 72°55'W, 110 m, *Vásquez, R. & N. Jaramillo* 11670 (MO). **Pasco**: Oxapampa, Distrito Iscozacín, *Pariona, W. & J. Ruiz* 1042 (MO); 2-3 km E of Iscozacín, 10°11'S, 75°13'W, 400 m, *Smith, D.* 2866 (MO); Palcazu valley, Izcozacín, trail to Villa America, 4 km from airstrip, 10°12'S, 75°15'W, 400 m, *Foster, R. et al.* 7893 (MEXU, MO, US, USM). **San Martín**: Lamas, Distrito Alonso de Alvarado, San Juan de Pacaizapa, km 72 highway Tarapoto-Moyobamba, 1000-1050 m, *Schunke, J.* 9629 (GH, MEXU, MO, U, US).

Distinctive characters

Columnnea ericae var. *ericae* can be recognized by having the following traits: (1) a sericeous dorsiventral vegetative shoot, with short internodes; (2) the larger leaf in a pair oblanceolate, adaxially green, abaxially green less often reddish with contrasting red or deep purple in the apical 1/3 or 1/5 of the foliar

area, 11 veins (rarely 7-14); (3) inflorescences with two to three pedicellate flowers usually adpressed to the ventral side of the vegetative shoot, bracts lanceolate, 1-3.5 × 0.2-0.8 cm; and (4) pedicels densely sericeous, 0.6-3.8 cm long, corolla erect in the calyx, limb bilabiate, yellow with two deep purple vertical stripes along both sides of the ventral lobe, and a nectary of one dorsal gland (Figures 6 and 7). This variety is similar to *C. ericae* var. *archidonae*, and to *C. stilesiana*, although it can be differentiated from them by the shorter pedicel, the corolla color, and additional differences presented in Table 1.

Columnnea ericae Mansf. var. *archidonae* (Cuatrec.) L.P. Kvist **comb. et stat. nov.**

Columnnea archidonae Cuatrec., *Anales Ci. Univ. Madrid* 4: 245 (reprint p. 42). 1935. *Dalbergaria archidonae* (Cuatrec.) Wiehler, *Phytologia* 27: 316. 1973.

TYPE: ECUADOR: **Napo**: Between Baeza and Archidona, Mar.-Apr., 1865, *Isern, J.* 497 (Lectotype: MA - designated by Kvist & Skog *Allertonia* 6: 355, 1993) (Figure 8).

Columnnea ericae var. *archidonae* differs from the typical variety by having smaller leaves, bracts, and corollas, while the internodes and the pedicels are longer. The corolla is oblique in the calyx, homogeneously yellow (rarely with purple spots), remarkably curved dorsally, the red marks below the larger leaf do not extend to the apex, the spots do not have a defined shape, and are distributed along the arcs subtended by the two apical secondary veins; the flowers often present a staminode; the nectary consists of 2 (rarely 4 glands). In general, the flowers of this variety are more exposed, *i.e.*, they are not adpressed to the vegetative shoot (Figure 8).

Etymology: The epithet used by José Cuatrecasas to name *Columnnea archidonae* refers to Archidona, a colonial town north of Tena (Napo Province, Ecuador) from where the species was originally collected.

Table 1. Comparison of morphological traits and geographical distribution of *C. ericae* Mansf. var. *ericae*, *C. ericae* Mansf. var. *archidonae* (Cuatrec.) L.P. Kvist and *C. stilesiana* M. Amaya & L.P. Kvist.

Character	<i>C. ericae</i> Mansf. var. <i>ericae</i>	<i>C. ericae</i> Mansf. var. <i>archidonae</i> (Cuatrec.) L.P. Kvist	<i>C. stilesiana</i> M. Amaya & L.P. Kvist
Internode length	0.7-3.0 cm	1.4 -7.0 cm	1.2-5.0 cm
Larger leaf texture	Papyraceous	Papyraceous	Membranous (less commonly papyraceous)
Larger leaf shape and size	Oblanceolate to narrowly oblong, 11.5-23.0 × 2.8-7 cm	Oblanceolate to narrowly oblong, 6.5-18.0 × 2.0-4.8 cm	Oblanceolate to narrowly oblong, 15-25 × 3-5 cm
Number of veins on the larger leaf	11 (7-14)	8 (6-10)	10-11
Abaxial larger leaf color	Green or reddish, apically red 1/3 or 1/5 of the foliar area	Green, red-spotted at apex or in the arcs formed by the 2 first apical secondary veins	Totally reddish with deep purple apically, on almost 1/2 of the apical foliar area
Bract size	1.0 -3.5 × 0.1-0.6 cm	0.4- 2.2 × 0.1- 0.8 cm	Bracts absent. Bracteoles 0.3-0.8 × 0.1 cm
Pedicle length	0.6- 3.8 cm	3.4-8.0 cm	3.8-4.7
Corolla orientation in calyx	Erect	Oblique	Oblique
Corolla color	Yellow with two vertical stripes along both sides of the ventral lobe	Yellow (rarely with purple spots)	Violet-magenta
Corolla length	5-7 cm	4.5 (4-6) cm	6-7.6 cm
Filaments	4-4.5 cm	4.2-4.7 cm	5.2-6.1
Staminal blade	0.5 cm	0.5 cm	1.0 cm
Staminodium	Absent	Absent/Present	Absent
Nectary	One bidentate gland 0.2 × 0.3 cm	Two glands 0.2 × 0.2 cm	One tri- or tetradentate-gland 0.3 × 0.2 cm (rarely two glands).
Style length	4.5 cm	4.3-4.5 cm	5.4-6.2 cm
Distribution	Colombia: Amazonas, Caquetá, Putumayo, Vaupés at 90-1000 m. Ecuador: Morona-Santiago, Napo, Pastaza, Tungurahua, Zamora, at 270-2200 m. Perú: Amazonas, Cajamarca, Huanuco, Loreto, Pasco, San Martín, 100-1650 m.	Colombia: Cauca, Huila, Putumayo at 1400-1800 m. Ecuador: Azuay, Imbabura, Napo, Tungurahua at 900-2500 m.	Colombia: Chocó, Valle del Cauca at 1600-2300 m.

Phenology: Specimens with flowers have been recorded in almost all months of the year, except February, August, and October.

Distribution: *Columnea ericae* var. *archidonae* has been collected in the Andean foothill forest in southern Colombia (Cauca, Huila, Putumayo) at 1400-1800 m alt., and central Ecuador (Azuay, Imbabura, Napo, Tungurahua) at 900-2500 m.

Representative specimens: COLOMBIA. **Cauca:** Municipio de Santa Rosa, Vereda La Petrolera, Bota Caucana, NE slope of the Serranía de Los Churumbelos, Road between Pitalito and Mocoa, Antena Inravisión,

1800 m, *González, C. E. 1958* (CAUP, COL); Bota caucana, Corregimiento San Juan de Villalobos, vereda La Esmeralda, 1°33'18.7"N, 76°18'18.6"W, 1686 m, *Munar, D. M. 613* (CAUP); **Huila:** Municipio Acevedo, National Natural Park Cueva de los Guacharos, between cabin Andaqui and El Pesebre, 1°36'N, 76° 6'W, 1900-2001 m, *Ramírez, B. et al. 14934* (CAUP); Río Villalobos, vicinity of Río Suazita, 1400 m, *Schultes, R. E. & M. Villareal 5196* (COL, US); **Putumayo:** Mocoa: road between Mocoa and Pitalito, *Fernández, J. L. 11474* (COL). ECUADOR. **Azuay:** Near Cola de San Pablo entrance, *Wiehler, H. et al. 8641* (US); **Imbabura:** Cantón, Ibarra Parroquia:

Lita. Comunidad de San Francisco next to Río Verde, 0°45'21"N, 78°27'09"W, 900-1100 m, *Clark, J. L. et al. 7519* (QCA, QCNE, SEL, US); **Morona-Santiago**: Cantón, Limón Indasa main road between Gualaceo and Plan de Milagro, "Tinajillas," 3°0'19"S, 78°36'36"W, 2800 m, *Clark, J. L. et al. 5906* (COL, HA, MO, QCNE, US); **Napo**: Cantón El Chaco, Río Granadillo, campamento de Inecel "Codo Alto", 0°8'S, 77°28'W, 1300 m, *Palacios, W. 5599* (US); Cantón Quijos, Parroquia Cosanga, Yanayacu, Biological Station and Center for Creative Studies, 5 km W of Cosanga (vía de Las Caucheras road), 0°35'93"S, 77°53'37"W, 2200 m, *Clark, J. L. & H. F. Greeny 5770* (K, QCA, QCNE, SRP, US); Quijos, Sierra Azul (agricola Industrial Río Aragón), campamento Estero Chico, 00°41'S, 77°56'W, 2500 m, *Alvarez, A. et al. 554* (US); Sierra Azul (agricola Industrial Río Aragón), Cedroyacu, 0°41'S, 77°57'W, 2100 m, *Alvarez, A. et al. 231* (US); Quijos Cantón, Reserva Ecológica Antisana, Río Aliso 8 km SW of Cosanga, 00°36'S, 77°57'W, 2390 m,

Vargas, H. et al. 2925 (US); Tena cantón, Parque Nacional Llanganates, via Salcedo-Tena, km 74-75, margen del Río Mulatos, 1°0'S, 78°11'W, 1950 m, *Vargas, H. et al. 2383* (US); **Pastaza**: Road Puyo-Macas, ca. 15 km SW of Puyo, *Lugo, H. 4702* (GB, SEL, US); **Tungurahua**: Baños, National Park Llanganates, Cordillera Sacha Llanganates, trail along Río Zuñac, 1°22'50"S, 78°9'44"W, 1500 m, *Neill, D. et al. 13541* (US); Cantón Baños, 7 km SW of Baños, 10-11 road-km SW of main highway, Comunidad Viscaya. 1°20'35"S, 78°23'44"W, 2500 m, *Clark, J. L. et al. 7752* (AAU, MO, QCA, QCNE, SEL, UNA, US); Parroquia Río Negro, near **Río Topo**. Locality near Río Topo, 1°23'8.7"S, 78°10'0.12"W, 1400 m, *Clark, J. L. & V. Duran 6013* (AAU, COL, NY, QCA, QCNE).

Columnea ericae var. *archidonae* was initially described as *Columnea archidonae* (Cuatrecasas 1935), later it was reduced to the synonymy of *C. ericae* Mansf. (Kvist & Skog 1993) because the similarity of these

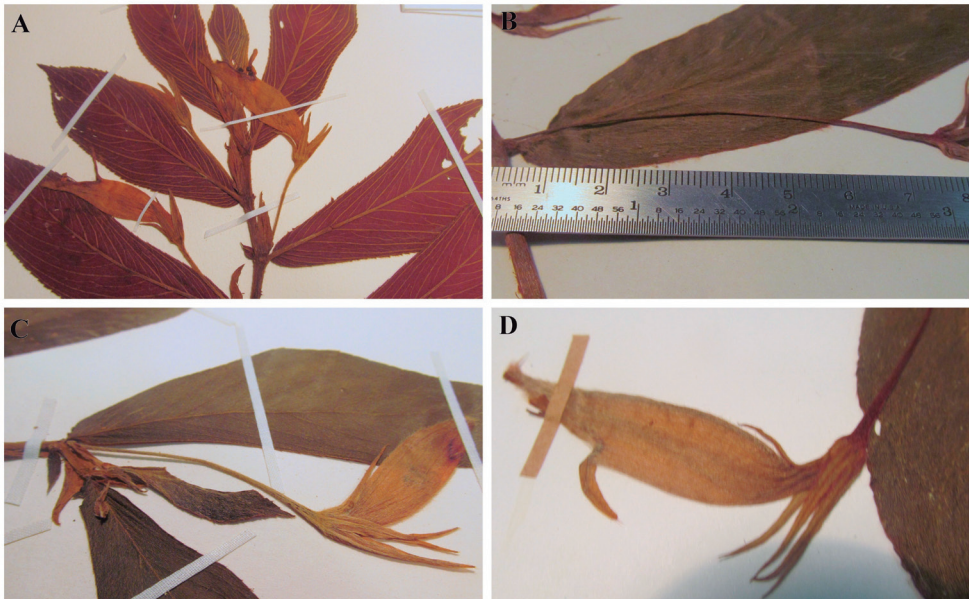


Figure 8. *Columnea ericae* Mansf. var. *archidonae* (Cuatrec.) L.P. Kvist. **A.** Ventral view of the vegetative shoot with flowers exposed from the vegetative shoot. **B.** Pedicel. **C.** Corolla oblique in the calyx. **D.** Lateral view of the flower, showing the bilabiate limb.

two species. However, detailed morphological analysis carried out in the present study, evidence two distinctive taxonomic entities, with consistent morphological patterns and geographical distributions (Table 1). We decided to give a new status to *C. archidonae* Cuatrec. as a variety of *C. ericae*. Future ecological and molecular studies will determine if these two entities correspond to two different species. The Colombian specimens coming from the Departments of Cauca and Huila vary from the rest of the studied specimens in that they have a larger and narrower oblong leaf which is membranous rather than papyraceous. It might correspond to a local phenotype of the populations from which the specimens were collected.

C. chocoensis and *C. stilesiana* are assigned here to section *Collandra* based on the following characteristics: dorsiventral shoots with anisophyllous sessil leaves, red/purple color patterns in the abaxial face. However, both species present unusual flower characteristics in *Collandra*; *C. chocoensis* has a bilabiate narrow limb with the upper limb formed by four lobes, instead of two, and *C. stilesiana* has corolla violet-magent, and it has a galea. Therefore, the taxonomic placement of the species described here might be temporal, waiting for molecular phylogenies that include these or similar species in their analysis.

ACKNOWLEDGMENTS

The authors thank the following: The National University of Colombia, Smithsonian Institution, and Aarhus University for the opportunity to do research on Gesneriaceae; Oscar Humberto Marín Gómez for discussion, for permission to use his photographs in this publication, and for his help with the figures; Marcela Morales for the preparation of the drawings; Diego Giraldo Cañas for providing helpful comments on the

early version of the manuscript; Carlos Parra for discussion; Laura Clavijo for her collaboration with the collections; Ayda Patiño for her support to MAM during her visit to the PSO; the following herbaria for allowing to study the collections A, AAU, COL, CUVC, E, F, MEXU, MO, MG, NY, PSO, QCA, QCNE, SEL, SRP, U and US. Three anonymous reviewers who helped to increase the quality of this paper with their valuable observations. The Fundación Ecológica los Colibríes de Altaquer (FELCA): Mauricio Florez Pai, Organización Ambiental Comunitaria (SERRANIAGUA): Johnier Arango Bermudez and Diego Gómez Hoyos (WCS Colombia) for their interest and support to the studies on the plant-hummingbird interaction.

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Recibido: 07/11/2014

Aceptado: 01/10/2015