

Amaya, Skog, & Kvist 2004

**Novae Gesneriaceae Neotropicarum XII: four new species of
Columnea (Gesneriaceae) section Collandra from Colombia.**

Edinb. J. Bot. 60: 415-424.

REFNO: 3260

KEYWORDS:

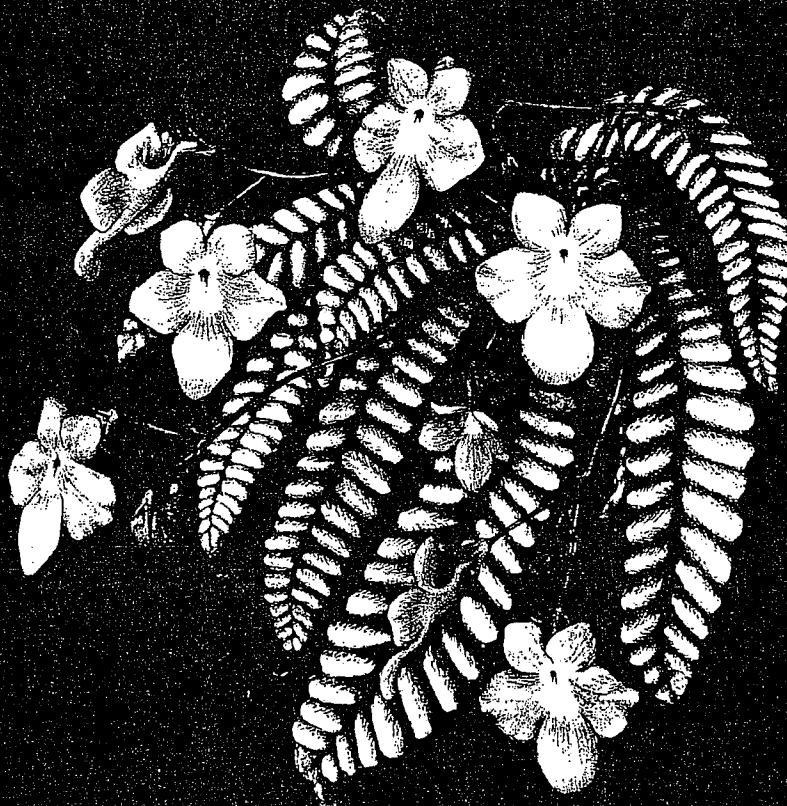
Colombia, Columnea, Pollination

EDINBURGH JOURNAL OF BOTANY

AN INTERNATIONAL JOURNAL OF PLANT
SYSTEMATICS AND BIODIVERSITY

VOLUME 60, No. 3

Dedicated to Bill Burt
in celebration of his ninetieth birthday



NOVAE GESNERIACEAE NEOTROPICARUM XIII:
FOUR NEW SPECIES OF *COLUMNEA*
(*GESNERIACEAE*) SECTION *COLLANDRA* FROM
COLOMBIA

M. AMAYA*, L. E. SKOG† & L. P. KVIST‡

Four new species of *Columnea* (*Gesneriaceae*) section *Collandra* (syn. *Dalbergaria* Tussac) are described from the remnant forests of the western and central cordilleras of Colombia: *C. coronocrypta*, *C. coronata*, *C. pedunculata*, and *C. queremalensis*. The flowers of *C. coronata* are unusual in the genus in having a corona, as in genera of *Gesneriaceae* pollinated by euglossine bees. *Columnea pedunculata* is distinct in having pedunculate inflorescences.

Keywords. Colombia, *Columnea*, *Gesneriaceae*, new species, pollination syndromes, sect. *Collandra*, systematics.

INTRODUCTION

The genus *Columnea* L. is probably the most speciose genus of *Gesneriaceae* in northwestern South America and southern Central America. Fifty species were reported for Panama (Skog, 1979), and more than 57 are known so far in Ecuador (Kvist & Skog, 1993). In Colombia, however, the genus is even more abundant with at least 70 species, but there are probably closer to 80 or more species (Kvist *et al.*, 1998), making the genus the largest of the *Gesneriaceae* in Colombia. There remain several still unassigned specimens of *Columnea* in herbaria. Below are described four new and distinctive species from Colombia, all from section *Collandra* (Lem.) Benth. It should be noted that section *Collandra*, as used here, is identical with the segregate genus *Dalbergaria* Tussac revised by Wiehler (1973, 1975, 1983), but not accepted by most subsequent authors (Morley, 1976; Skog, 1979; Kvist & Skog, 1993).

1. *Columnea coronocrypta* M. Amaya, L.E. Skog & L.P. Kvist, sp. nov. Fig. 1.
Differt a *C. chrysotricha* L.E. Skog & L.P. Kvist corolla brevior fere omnino in calyce inclusa. Lobi corollae ostium corollae claudunt, in *C. chrysotricha* vero ipsi expansi sunt. Gibba in basi corollae in duplicem plicam comprimitur.

* Instituto de Ciencias Naturales, Universidad Nacional de Colombia, A.A. 7495 Bogotá, D.C., Colombia. E-mail: mamayam@ciencias.unal.edu.co

† Department of Systematic Biology/Botany Section, MRC-166, PO Box 37012, Smithsonian Institution, Washington, DC 20013-7012, USA. E-mail: skog.larry@nmnh.si.edu

‡ Unit of Forestry, Department of Economics and Natural Resources, The Royal Veterinary and Agricultural University, DK-1871 Frederiksberg C, Copenhagen, Denmark. E-mail: lars_peter_kvist@hotmail.com

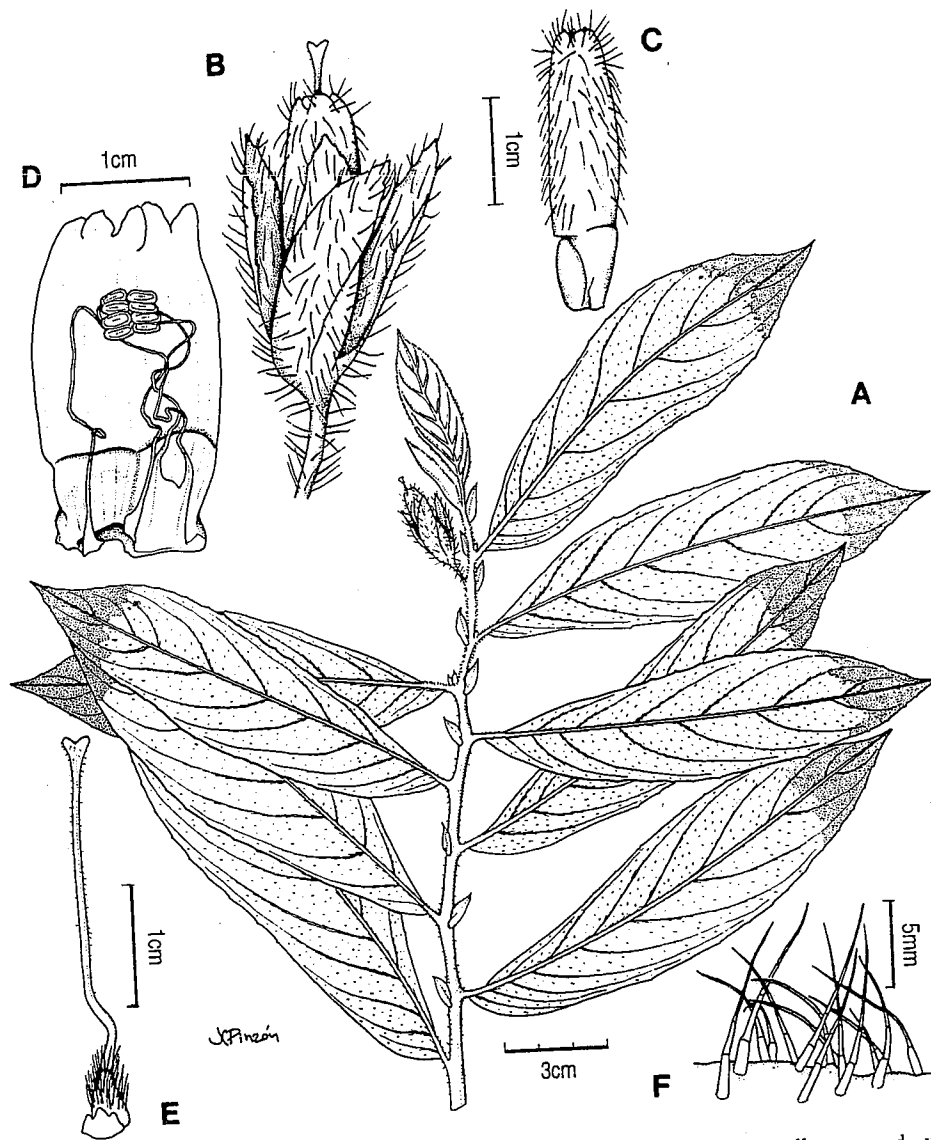


FIG. 1. *Columnea coronocrypta*. A, habit; B, flower; C, corolla; D, corolla opened, with stamens; E, pistil and nectary; F, stem indumentum. Based on González 77 (COL).

Type: Colombia, Departamento de Cauca, Municipio de Santa Rosa, Bota Caucana, Serranía de los Churumbelos, finca la piedra, 1°14'N, 76°3'W, 1100m, vii 1998, González 77 (holo. COL).

Clambering shrub; shoots dorsiventral. *Stems* subterete, 3mm in diam., with dense golden 7-12-celled hairs; internodes 1.2-2.3cm long. *Leaves* opposite, strongly anisophyllous. Larger leaf with petiole 3-5mm long; blade narrowly oblong, 13-16.6 × 3.5-4.5cm, asymmetric, base oblique, apex acuminate, margin irregularly

serrulate, longer side with 7 or 8 veins, adaxially dull green and sparsely strigose with 5–6-celled hairs, abaxially pale green with contrasting red-purple area in distal fifth, densely strigose, hairs translucent, occasionally mixed with white setulose hairs, all hairs more dense on veins. Smaller leaf sessile; blade lanceolate, 1×0.3 cm, base oblique, apex attenuate, margin entire, strigose on both surfaces. *Inflorescences* borne in axils of larger leaves, sessile, fascicles 1–2-flowered; bracts 2–4, ovate, 2–5 mm long, apex attenuate, densely hirsute on both surfaces; pedicels 1 cm long, densely golden hirsute. *Calyx* lobes imbricate, subequal, $2.4\text{--}2.8 \times 0.5\text{--}0.9$ cm, narrowly oblong, green with purple tip outside, densely hirsute on both surfaces. *Corolla* tube 2.7×0.8 cm (at widest point), pink and cream-coloured towards base, where gibbous and dorsally compressed for 5 mm; lobes subequal, 2×2 mm, weakly dentate, curved inwards and closing corolla mouth. *Stamens* 4, included; filaments 2.4 cm long; posticous pair connate at base for 5 mm; anticous pair almost free from base; anthers 2 mm, quadrate. *Nectary* a dorsal 3-lobed gland. *Ovary* narrowly conical, 5×3 mm, densely sericeous; style 3 cm long, with glandular hairs; stigma bilobulate. *Fruits* and seeds not seen.

Additional specimens examined. No additional collections have been seen.

Distribution and habitat. So far known only from the type locality on the western slopes of the eastern cordillera of the Colombian Andes in the department of Cauca, between 1000 and 1400 m. The type specimen was collected from premontane wet forest where annual precipitation is more than 4000 mm and is influenced by the Amazon basin and the Andes.

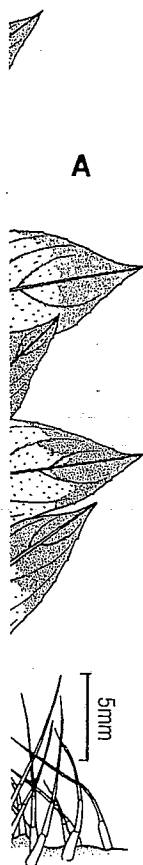
Columnnea coronocrypta is very similar to *C. chrysotricha* L.E. Skog & L.P. Kvist, and they are sympatric in the Serrania de los Churumbelos. Floral characters warrant recognition of the former as a new species. *Columnnea coronocrypta* is distinctive in the calyx nearly hiding the corolla, the corolla lobes closing the mouth of the corolla, and the gibbous corolla base being dorsally compressed to form two compartments. Another recently described species, *Columnnea reticulata* M. Amaya, L.E. Skog, C.E. González & J.F. Smith, comes from the same locality in the Serrania de los Churumbelos (Amaya *et al.*, 2000) and a new species of *Alloplectus* is also under study from the same area.

Derivation. The specific epithet is derived from the Greek: *corona* = corolla and *crypta* = hidden.

2. *Columnnea coronata* M. Amaya, L.E. Skog & L.P. Kvist, sp. nov. Fig. 2.

Differt a ceteris speciebus generis *Columnneae* praesentia coronae et corollae lobis petaloideis.

Type: Colombia, Departamento de Antioquia, Municipio de Yarumal, Alto de Ventanas, $6^{\circ}54'N$, $75^{\circ}25'W$, 2100 m, 8 xi 1987, J.L. Luteyn & O. Maruleda 11892 (holo. COL; iso. HUA, NY, US).



opened, with
OL).

Rosa, Bota
/, 1100m, vii

, with dense
ite, strongly
wly oblong,
n irregularly

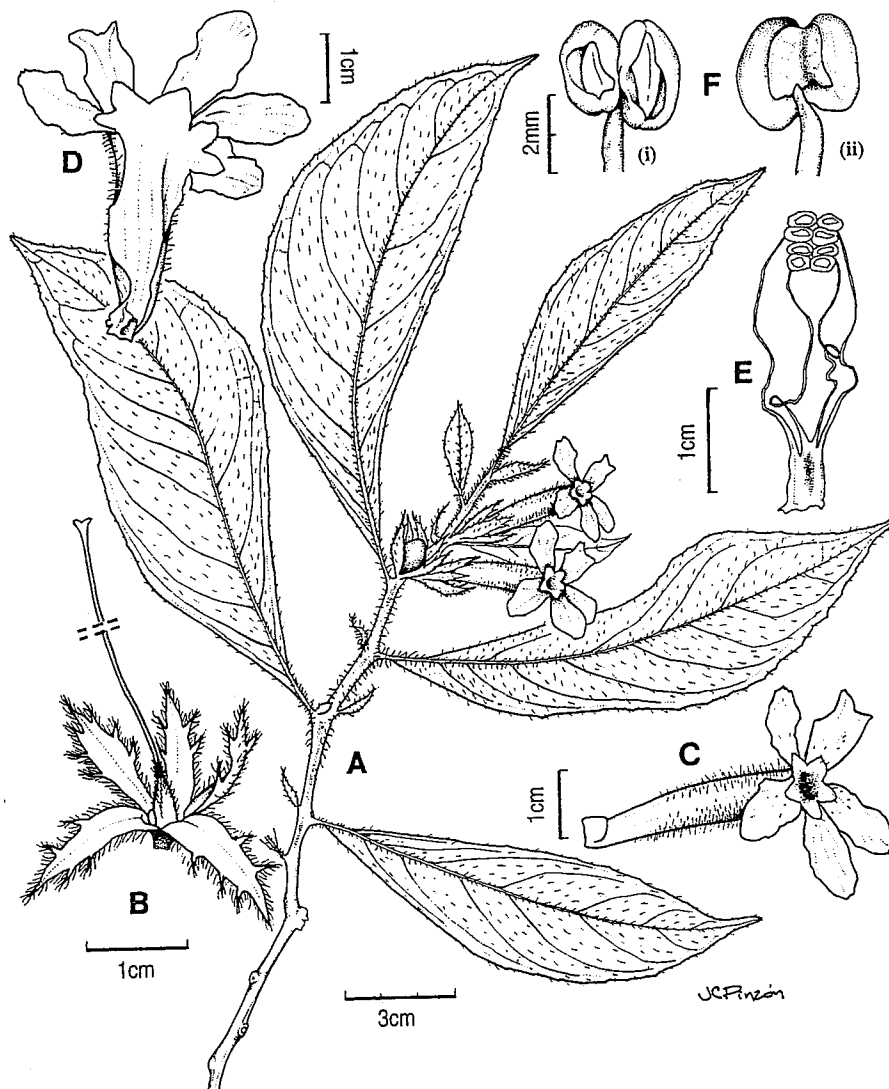


FIG. 2. *Columnea coronata*. A, habit; B, calyx, pistil, and nectary; C, corolla showing corona; D, corolla opened; E, androecium; F (i) detail of ventral side of anther, (ii) detail of dorsal side of anther. Based on Luteyn & Maruleda 11892 (COL).

Clambering shrub; shoots dorsiventral. *Stems* subterete, 4mm in diam., narrowing to 2mm towards apex, with golden or translucent 7–10-celled hairs; internodes 0.8–2.7cm long. *Leaves* opposite, strongly anisophyllous. Larger leaf with petiole 4–8mm long; blade obovate to narrowly oblong, 9–15 × 2.5–4.5cm, asymmetric, base oblique, apex acuminate, margin irregularly serrate with red hairs, longer side with 8–10 veins, adaxially dull green, hirsute, abaxially pale green, with 7–10-celled translucent hairs mixed with setulose 1-celled white hairs. Smaller leaf sessile; blade



corolla showing
ther, (ii) detail of

am., narrowing
airs; internodes
leaf with petiole
symmetric, base
airs, longer side
with 7-10-celled
leaf sessile; blade

lanceolate, 1×0.2 cm, margin serrate, densely hirsute on both surfaces. *Inflorescences* borne in axils of larger leaves, sessile, fascicles 2-flowered; bracts 2-4, ovate, 2-5 mm long, apex attenuate, densely hirsute on both surfaces; pedicels 2 mm long, densely hirsute, with 5 prominent glands distally near base of calyx. *Calyx* lobes valvate, subequal, $1.6 \times 0.4-0.7$ cm, margin dentate to fimbriate, densely hirsute outside, glabrous inside, ventral lobe slender and more densely hirsute. *Corolla* dark pink, salverform-bilabiate, 5.5 cm long, tube narrow, 3×0.5 cm, base with dorsal 4×4 mm gibbosity, hirsute outside, glabrous inside; limb broad, bilabiate, upper lip shorter than lower, 1.6×0.8 cm, 3-lobed, lower lip 2.4×0.9 cm, 2-lobed; corona of 5 appendages in front of corolla lobes, each 5×5 mm. *Stamens* 4, included, filaments 3 cm long, connate at base for 6 mm; anthers elliptic, 3×2 mm. *Nectary* of 2 bidentate dorsal glands, each 2×2 mm. *Ovary* conical, 4×3 mm; style 3.3 cm long with glandular hairs; stigma bilobulate. *Fruit* an ovoid berry, 9×6 mm, green; seeds not seen.

Additional specimens examined. No additional collections have been seen.

Distribution. Known only from the type locality in the central cordillera of Colombia in the department of Antioquia at Alto de Ventanas, growing at 1000-1200 m.

Columnnea is generally considered to be entirely bird-pollinated, with hummingbirds as the pollen vector (Jones & Rich, 1972; Wiehler, 1983). Hummingbird pollination has been observed (Grove, 1985; Amaya, 1996) and also inferred from corolla shapes, which consistently fit into three of the four categories proposed by Wiehler (1983). However, the corolla shape of *C. coronata* may suggest a new pollination syndrome for *Columnnea*. The corolla of this species has a corona on top of a long narrow tube, and abruptly spreading lobes forming a broad bilabiate limb, resembling the typical salverform corolla of flowers pollinated by euglossine bees. The corolla lobes of *C. coronata* have irregular margins, though they are not fimbriate as in species of *Episcia* C. Martius, *Nautilocalyx* Linden, *Paradrymonia* Hanst., and *Drymonia* C. Martius, believed to be pollinated by euglossine bees (Wiehler, 1978).

Derivation. The specific epithet refers to the presence of a corona, a character uncommon in *Columnnea* section *Collandra*, and in the genus as a whole.

3. *Columnnea pedunculata* M. Amaya, L.E. Skog & L.P. Kvist, sp. nov. Fig. 3.

Differt a ceteris speciebus generis *Columnneae* pedunculis patentibus; a *C. florida* C.V. Morton differt corolla obliqua in calyce longiore rubra indumento hirsuto aureo praedita, foliis chartaceis 16 venis in latere longiore praeditis.

Type: Colombia, Departamento Risaralda, Municipio de Mistrato, 12 km NE of the Cabecera municipal [center], $4^{\circ}3'N$, $75^{\circ}54'W$, 1800-1900 m, iii 1991, G. Galeano et al. 2416 (holo. COL).

Clambering shrub; shoots dorsiventral. *Stems* subterete, to 3 m tall, 0.6-1.1 cm in diam., prominently scaly, sparsely pilose; internodes 1.5-7.5 cm long. *Leaves*

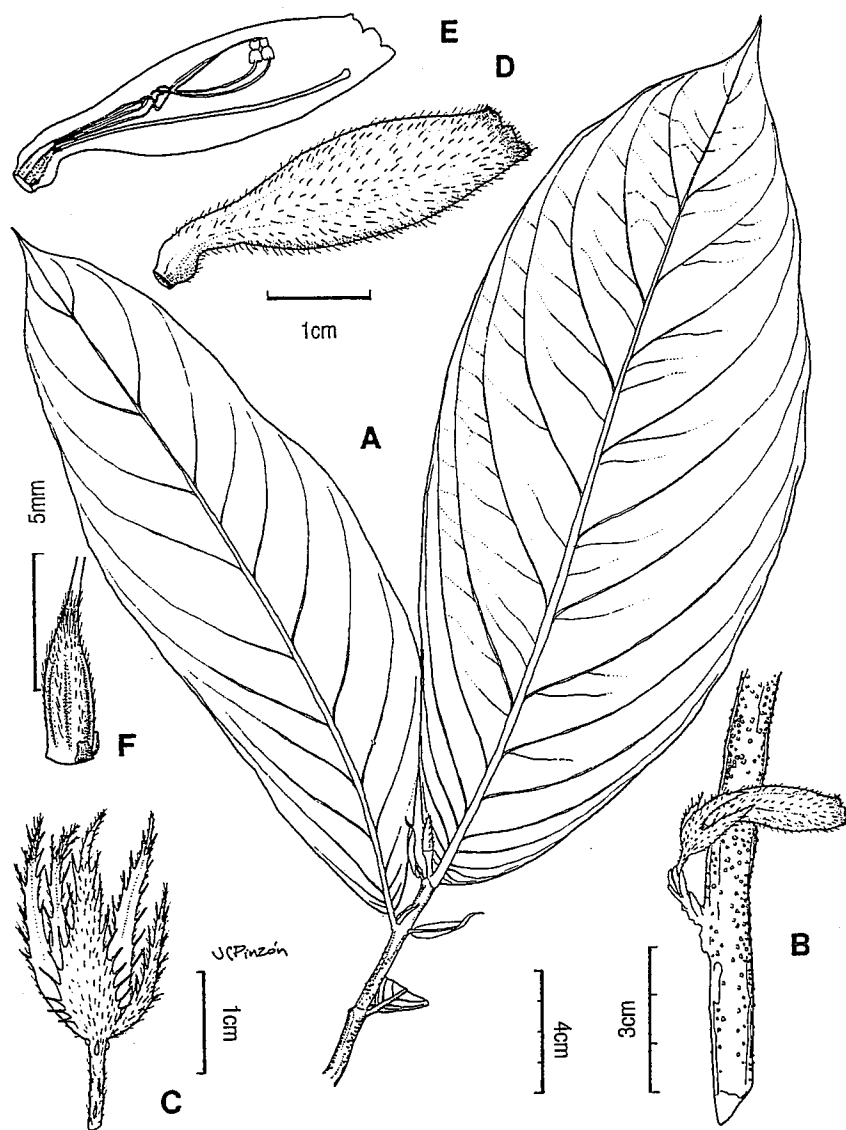


FIG. 3. *Columnnea pedunculata*. A, habit; B, stem, peduncle, pedicel, and flower; C, calyx and pedicel glands; D, corolla; E, corolla opened to show stamens and pistil; F, ovary and nectary glands. Based on Galeano et al. 2416 (COL).

opposite, strongly anisophyllous. Larger leaf with petiole 0.5–1.2cm long; blade elliptic to narrowly ovate, 11–28 × 3–11.5cm, chartaceous, asymmetric, base oblique and obtuse, apex acuminate, margin subentire, longer side with 14–16 veins, adaxially dull green and glabrous, veins prominent, abaxially pale green, sometimes with contrasting deep purple spots in apical fifth, sparsely punctate with diminutive red glands, glabrous except sericeous on prominent veins. Smaller leaf 2–3 × 0.8cm,

lanceolate, base oblique, apex attenuate, margin entire, glabrous. *Inflorescences* borne in axils of larger leaves, 1-(?)-flowered; peduncles 1.2cm long; bracts numerous, scaly, 5-8 × 3mm, ovate, apex acuminate, cream-coloured, sparsely pilose on both surfaces; pedicels 5-9mm long with several glands along their length, red to golden hirsute with 6-celled hairs. *Calyx* lobes joined only at base, unequal, fimbriate, the ventral lobe broadly ovate, 6 × 4mm, the other 4 lanceolate, 1.5-2.1 × 0.2-0.5cm. *Corolla* red, oblique in calyx, tube cylindric, 4.2cm long, base with 4 × 4mm ventral gibbosity, constricted above to 6mm, ventricose at middle to 1.2cm, constricted at throat to 8mm, golden hirsute; limb oblique, lobes subequal, 5-7 × 5mm. *Nectary* of 2 ventral glands. *Stamens* included; filaments to 4cm long, all connate at base for 8mm; anthers quadrate, 2.2 × 2.5mm. *Ovary* narrowly ovoid, 6 × 2mm, sericeous; style 3.7cm long, glabrous; stigma mouth-shaped. *Fruits* and seeds not seen.

Additional specimens examined. COLOMBIA. Antioquia: Parque Nacional Natural Las Orquideas, sector Calles, margin of the Río Calle, v 1988, *A. Cogollo et al.* 3058 (COL). Chocó: Municipio de San José del Palmar, hoya del río Torito (afluente del río Hábita) declive oriental, iii 1980, *E. Forero et al.* 7216 (COL). Risaralda: Municipio Mistrató, 12km NE of the Cabecera municipal [center], 1800-1900m, iii 1991, *G. Galeano et al.* 2363 (COL).

Distribution and habitat. Known from the montane forest on the western slopes of the Cordillera Occidental in the Colombian departments of Risaralda, Chocó, and Antioquia at 850-1900m.

Species in sect. *Collandra* have thyrs-like inflorescences in which the main axis is indeterminate and the lateral axes are determinate with usually sessile or stalkless fascicles. *Columnea pedunculata* is very distinctive within *Columnea* in being the only species known to have peduncles. The closest species is probably *C. florida*, from which the new species can be differentiated by the red rather than yellow corollas, which are oblique in the calyx instead of erect. The occurrence of diminutive red glands on the abaxial surface of the leaves is a character shared with several other species of sect. *Collandra*. These may be extrafloral nectaries similar to those in the genus *Codonanthe* (Mart.) Hanst. Various species of ants have been found on the leaves of herbarium specimens, in at least three species of *Columnea* sect. *Collandra* (pers. obs.). It is possible that the presence of extrafloral nectaries and ants indicates an ecological association not previously discovered in the genus *Columnea*. (The scale of the drawing does not allow illustration of the small glands.)

4. *Columnea queremalensis* M. Amaya, L.E. Skog & L.P. Kvist, sp. nov. Fig. 4. Differt a *Columnea villosissima* Mansf. corolla versus basim ventricosa, colore generali rubro vinaceo. A *C. coronocrypta* M. Amaya et al. (vide supra) petiolo folii majoris multo longiore (9-22mm non 3-5mm longo), lobis calycis multo minoribus (1.2-1.5mm non 2.4-2.8mm longis), corolla paulo longiore (3.2cm non 2.7cm) extus lutea (haud rosea) recedit.



C, calyx and nectary

ong; blade
ase oblique
-16 veins,
sometimes
diminutive
-3 × 0.8cm,

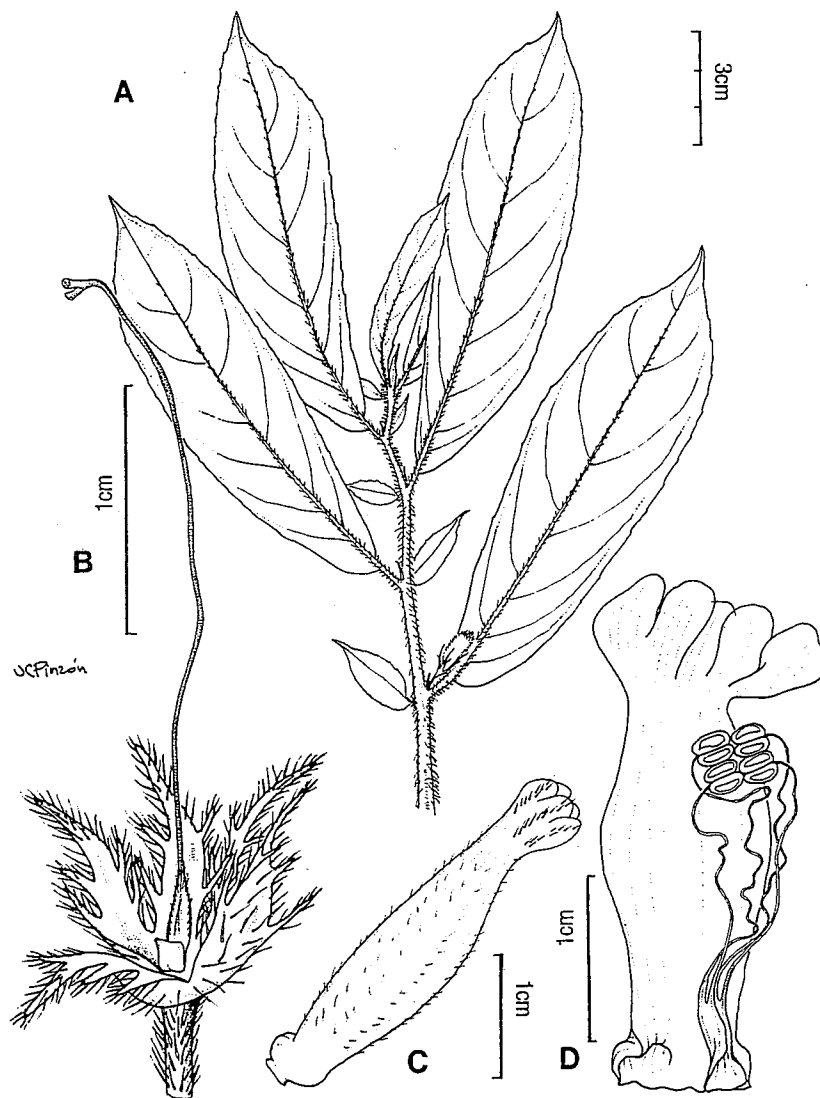


FIG. 4. *Columnnea queremalensis*. A, habit; B, calyx, pistil, and nectary; C, corolla; D, corolla opened to show stamens. Based on *Amaya & Smith 620* (COL).

Type: Colombia, Departamento de Valle del Cauca, Municipio Queremal, carretera vieja a Buenaventura, 3°15'N, 76°42'W, 1000m, iv 1998, *M. Amaya & J.F. Smith 620* (holo. COL, iso. US).

Clambering shrub; shoots dorsiventral. *Stems* subwoody, subterete to 4m, 2–5cm in diam., epidermis pale green, with dense, golden 8–12-celled hairs; internodes 1.2–1.8 (–5)cm long. *Leaves* opposite, strongly anisophyllous. Larger leaf with densely hirsute petiole 0.9–2.2cm long; blade narrowly oblong, 11–21.5 × 2.2–6.5cm, papyraceous,

asymmetric, base oblique, apex attenuate to acuminate, margin irregularly serrate, longer side with 7 or 8 veins, adaxially deep green, with sparse 5–8-celled hairs, veins obscure, abaxially deep purple, sparsely golden hirsute on and between veins, also white setulose; veins prominent. Smaller leaf sessile; blade lanceolate, 1.7–4.2 × 0.5–1.3cm, base oblique, apex attenuate, margin serrate, sparsely hirsute. *Inflorescences* borne in axils of larger leaves, sessile, fascicles 1- or 2-flowered; bracts two, 3 × 1mm, pale green; pedicels 3–6mm long, sparsely golden hirsute. *Calyx* lobes valvate, subequal, 1.2–1.5 × 0.3–0.5cm, lanceolate, laciniate, yellow outside, densely hirsute. *Corolla* erect in calyx, cylindric and subventricose, 3.2 × 0.7cm, base with 3 × 6mm gibbosity, constricted above to 5mm, 7mm wide at middle, constricted at throat to 5mm, yellow outside with rows of deep purple hairs, hirsute, inside glandular at throat dorsally; lobes equal, 5 × 5mm, imbricate. *Stamens* 4, included, filaments 1.6cm long, connate at base for 6mm; anthers quadrate, 2 × 2mm. *Nectary* of 1 bidentate gland. *Ovary* ovoid with prominent ribs, 4 × 2mm, densely sericeous on ribs; style 2.7cm long; stigma bilobulate. *Fruits* and seeds not seen.

Additional specimen examined. COLOMBIA. Risaralda: Municipio de Santuario, Quebrada Risaralda, iv 1998, M. Amaya & J.F. Smith 516 (COL).

Distribution and habitat. Known from wet forest, between 400 and 900m, at the type locality in the Colombian department of Valle del Cauca, and from high montane forest at 2500–3000m in the department of Risaralda in an area of interdigitation between the Andean forest and the Chocó floristic region. The species is probably not endangered as it occurs in well-conserved forest.

ACKNOWLEDGEMENTS

We are grateful to Professor James F. Smith (Boise State University Herbarium, SRP) for supporting an expedition to collect *Gesneriaceae*, to Professor Enrique Forero (Herbario Nacional Colombiano, COL) for his help with the manuscript, and to Juan Carlos Pinzón for the preparation of the illustrations. We are also deeply grateful to Father Pedro Ortiz and Dr Robert Mill for help with the Latin diagnoses, and to Dr Crinan Alexander for editorial help. M.A. also acknowledges the support of the Division of Research (DIB), Universidad Nacional de Colombia.

REFERENCES

- AMAYA, M. (1996). *Polinización y sistemática del género Columnea (Gesneriaceae) en la Reserva Natural La Planada (Nariño)*. MS thesis, Universidad Nacional de Colombia, Bogotá. 134pp.
- AMAYA, M., SKOG, L. E., GONZÁLEZ, C. E. & SMITH, J. F. (2000). Una nueva especie de *Columnea* (Gesneriaceae) del norte de los Andes. *Caldasia* 22: 185–189.
- GROVE, F. K. (1985). *Reproductive biology of neotropical wet forest understory plants*. PhD thesis, University of Iowa, Iowa City. 187pp.
- JONES, C. E., JR & RICH, P. V. (1972). Ornithophily and extrafloral color patterns in *Columnea florida* Morton (Gesneriaceae). *Bull. S. Calif. Acad. Sci.* 71: 113–116.

3cm



corolla; D, corolla

emal, carretera
: J.F. Smith 620

o 4m, 2–5cm in
ernodes 1.2–1.8
densely hirsute
1, papyraceous,

- KVIST, L. P. & SKOG, L. E. (1993). The genus *Columnnea* (Gesneriaceae) in Ecuador. *Allertonia* 6: 327-400.
- KVIST, L. P., SKOG, L. E. & AMAYA-M., M. (1998). Los géneros de Gesneriáceas de Colombia. *Caldasia* 20: 12-28.
- MORLEY, B. D. (1976). A key, typification, and synonymy of the sections in the genus *Columnnea* L. *Contr. Nat. Bot. Gard. Glasnevin* 1: 1-11.
- SKOG, L. E. (1979). Family 175, Gesneriaceae. In: WOODSON, R. E., JR & SCHERY, R. W. (eds) *Flora of Panama, Part IX. Ann. Missouri Bot. Gard.* 65[1978]: 783-996.
- WIEHLER, H. (1973). One hundred transfers from *Alloplectus* and *Columnnea*. *Phytologia* 27: 309-329.
- WIEHLER, H. (1975). Name changes in neotropical Gesneriaceae. *Selbyana* 1: 32-35.
- WIEHLER, H. (1978). The genera *Episcia*, *Alsobia*, *Nautilocalyx*, and *Paradrymonia* (Gesneriaceae). *Selbyana* 5: 11-60.
- WIEHLER, H. (1983). A synopsis of the neotropical Gesneriaceae. *Selbyana* 6: 1-219.

An invited contribution to the Festschrift for B.L. Burt's ninetieth birthday