

# Novae Gesneriaceae Neotropicarum XVIII: *Columnea carinata*, a new species of Gesneriaceae from northwestern Ecuador

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**Abstract.** A new species of *Columnea* (Gesneriaceae, tribe Episcieae) is described from the Chocó floristic region of the western Andean slopes of northern Ecuador. *Columnea carinata* differs from other congeners by the presence of elongate shoots, isophyllous leaves, and a uniformly bright red corolla, with nearly complete fusion of the upper two corolla lobes and an elongate keel on the dorsal surface of the corolla tube.

**Key Words:** *Columnea*, Ecuador, Episcieae, Gesneriaceae, *Pentadenia*, taxonomy.

**Resumen.** Se describe una nueva especie de *Columnea* (Gesneriaceae, tribu Episcieae) de la región florística Chocó en el Norte de los Andes Ecuatorianos. *Columnea carinata* se distingue por la presencia de tallos elongados, hojas isófilas, corola de color rojo intenso, los dos lóbulos dorsales de la corola casi totalmente fusionados, y quilla elongada en la superficie dorsal del tubo de la corola.

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The genus *Columnea* L. is primarily epiphytic and belongs to the New World subfamily Gesnerioideae and tribe Episcieae. *Columnea* ranges from Mexico south to Bolivia and is most diverse in the northern Andes of Colombia and Ecuador. With over 200 species, *Columnea* is the largest genus in the subfamily Gesnerioideae (Skog & Boggan, 2006; Weber, 2004; Burt & Wiehler, 1995). The genus is distinguished from other closely related genera by the fruit, which is an indehiscent berry instead of a fleshy bivalved capsule.

The species described here was discovered during ongoing exploratory research expeditions to the western Andean slopes of Ecuador by the first author between 1994 and 2003. The Fundación Golondrinas's work in Santa Rosa and Mirador de las Golondrinas (Provincia Carchi) played an important role in facilitating these expeditions. Numerous undescribed species remain to be published from these expeditions. Gesneriaceae species recently described from this region include *Cremosperma anisophyllum* J. L. Clark & L. E. Skog (Clark & Skog, 2011),

*Columnea lucifer* J. L. Clark (Clark, 2011), *Kohleria hypertrichosa* J. L. Clark & L. E. Skog (Clark & Skog, 2008), *Monopyle multiflora* Keene & J. L. Clark (Keene et al., 2011), and *Monopyle uniflora* J. L. Clark & Keene (Keene et al., 2011).

***Columnea carinata*** J. L. Clark & L. E. Skog, **sp. nov.** Type: Ecuador. Carchi: Cantón Mira, parroquia Jijon y Camaño, unfinished road from El Carmen towards Chical, Agua Amarilla, 00° 49'N, 78°12'W, 1700–2300 m, 8 Jul 2003 (fl), J. L. Clark & E. Folleco 8507 (holotype: US; isotypes: BRIT, CAS, K, MO, NY, QCA, QCNE) (Figs. 1, 2)

A *Columneae* aliis speciebus corollarum tubo dorsaliter carinato differt.

*Scandent epiphytic climber*; stems elongate and erect, to 2 m long, suffrutescent, glabrescent below, sparsely pilose above. *Leaves* opposite, nearly equal in a pair; petioles terete, 5–10 mm long, pilose, blade papyraceous when dry, ovate, 2–6 × 2–3 cm, base rounded to obtuse, apex acute, margin serrate, adaxially dark green,

abaxially light green, sparingly to densely pilose on upper and lower surfaces. *Flowers* solitary; calyx lobes 5, nearly free, lobes erect at anthesis, oblong, 0.7–1.5 × 0.2–0.5 cm, apex acute, margin serrulate, uniformly light green, inside and outside sparsely pilose; corolla tubular with prominent keel on dorsal surface, posture erect in calyx, 3.0–5.5 × 0.6–1.3 cm; outside uniformly bright red and pilose, throat yellow suffused with red, dorsal lobes fused to form a hood, stamens 4, didynamous, included; filaments ca. 3 cm long, connate and adnate to the base of the corolla tube, glabrous; anthers longer than broad, ca. 2 × 1.5 mm, dehiscing by longitudinal slits; staminode not seen; nectary a single-lobed dorsal gland, glabrous; ovary superior, densely pilose, 0.2–0.4 × 0.2 cm, style 2.5 cm long, glabrous, stigma included and stomatomorphic. *Fruits* not seen.

*Distribution and ecology*.—*Columnnea carinata* is known from the western slopes of the Ecuadorian Andes in the provinces of Carchi and Imbabura from 1900 to 2600 m. Most of the collections of *Columnnea carinata* are from the Cerro Golondrinas Protected Forest Reserve, which is managed by the Ecuadorian non-governmental organization, Fundación Golondrinas. The work in the cloud forest and adjacent lower Río Mira Valley by the foundation plays an important role in the conservation of the region's biodiversity and community outreach. The forests of the Cerro Golondrinas Protected Forest Reserve have been classified as *bosque siempreverde piemontano* (Sierra et al., 1999); *selva ombrófila noroccidental del pie de cordillera* (Acosta Solis, 1968); *bosque muy húmedo premontano* (Cañadas, 1983); and *bosque lluvioso montano bajo* (Harling, 1979).

*Phenology*.—Flowering in July, August, and October.

*Etymology*.—The specific epithet, *carinata*, refers to the keeled or ridged region on the dorsal surface of the corolla.

*Conservation and IUCN Red List category*.—*Columnnea carinata* is known from two recently documented populations in north-western Ecuador. The known distribution of *Columnnea carinata* is restricted to two localities, with most of the collections from the

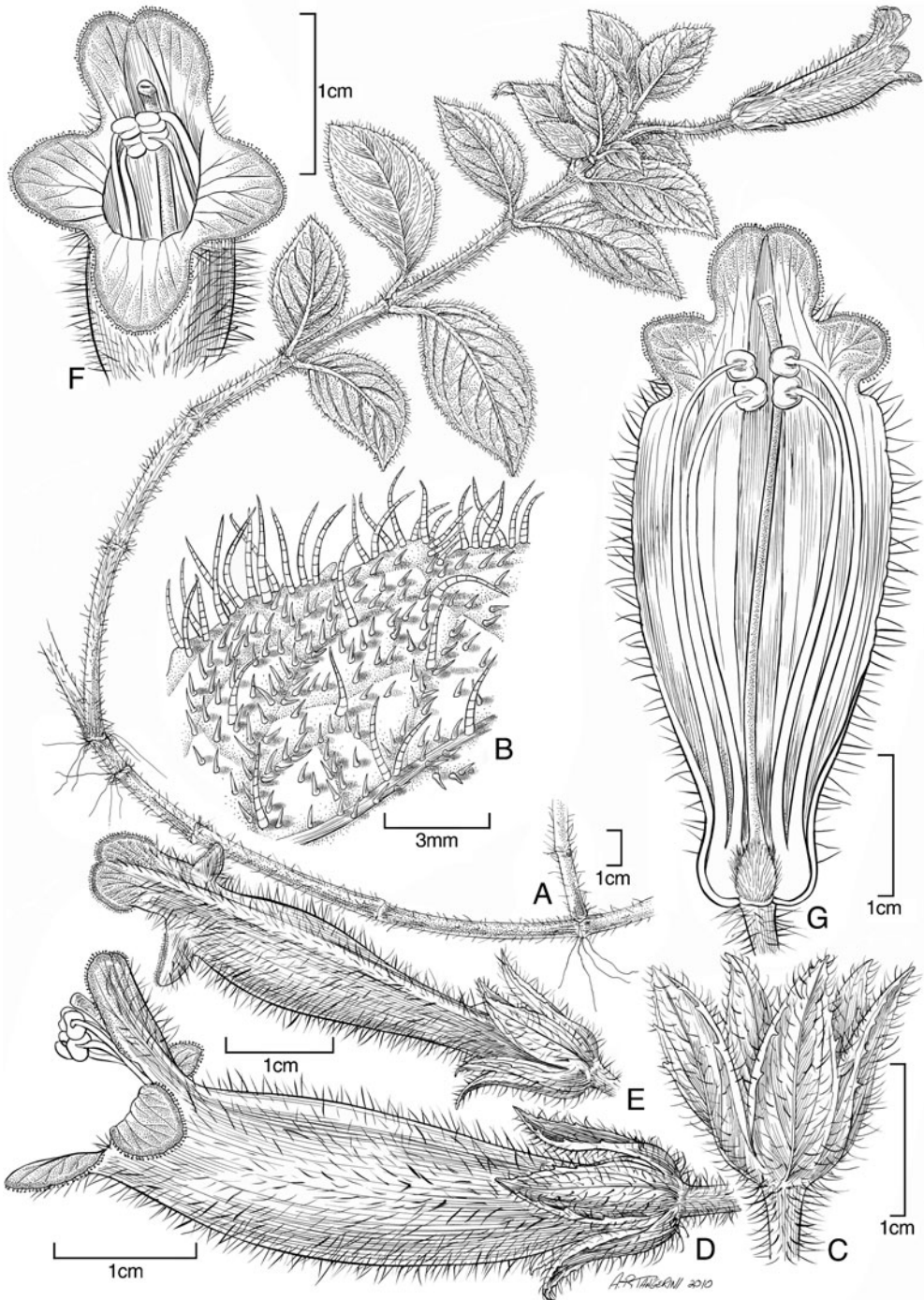
Cerro Golondrinas Protected Forest Reserve (Provincia Carchi). One population was documented from a single collection in the “Hacienda La Florida” in the eastern buffer zone outside of the boundaries of the Cotacachi Cayapas Ecological Reserve (Provincia Imbabura).

According to the IUCN Red List criteria for limited geographic range (B2a, less than 10 km<sup>2</sup>), severely fragmented or known to exist at no more than five locations (B1a), and considering the uncertain future of habitat conservation along the western Andean slopes, *Columnnea carinata* should be listed in the category EN (Endangered).

**Additional specimens examined: ECUADOR.**  
**Carchi:** Cantón Espejo, Parroquia Guatal, Mirador de las Golondrinas, Fundación Golondrinas, trail from Santa Rosa (El Rosal) to the refugio at El Corazon, 00°49'46"N, 78°07'03"W, 1600–2000 m, 5 July 2003, J. L. Clark, S.G. Clark, E. Folleco & B. Syka 8436 (BRIT, CAS, K, MO, NY, QCA, QCNE, US); El Carmen, Cerro Golondrinas, 00°50'N, 78°11'W, 2000–2400 m, 18–25 Aug 1994, M. Tirado, P. Fuentes, R. Zurita & L. Chamorro 1234 (QCNE, US); El Gualtal, Faldas de Cerro Golondrina Hembra, 00°51'N, 78°07'W, 2450 m, 21 Aug 1994, W. Palacios & J.L. Clark 12634 (QCNE, UNA, US); Maldonado–Tulcán road, ca. km 20, 2400–2600 m, 7 Oct 1981, L. Werling & S. Leth-Nissen 364 (QCA).  
**Imbabura:** Cotacachi, Hacienda La Florida, 00°23'S, 78°28'W, 1900–2500 m, 28 Aug 1992, A. Alvarez & R. Castro 652 (MO, QCNE).

*Columnnea carinata* appears to belong to section *Pentadenia* (Planchon) Benth. Species of section *Pentadenia* are distinguished by a suffruticose habit with isophyllous leaves, sometimes long pedicels, and an inflorescence reduced to one to three flowers (Smith, 1994). These characters are found in *Columnnea carinata* and it is therefore recognized as a member of section *Pentadenia*. One character that is in conflict with its placement in section *Pentadenia* is the presence of a single dorsal nectary gland. Most members of section *Pentadenia* have a five-lobed nectary, but this character was shown to vary within species and was not recommended for taxonomic delimitation at any level in *Columnnea* (Smith, 1994).

There are numerous vegetative and reproductive characters that distinguish *Columnnea carinata* from other congeners. Vegetatively, the stems are slender and elongate with evenly spaced leaves (Fig. 2B). Other members of section *Pentadenia* tend to have succulent to



**FIG. 1.** *Columnea carinata*. **A.** Habit. **B.** Adaxial leaf surface. **C.** Calyx. **D.** Lateral view of flower. **E.** Dorsal view of flower showing keel. **F.** Front view of flower showing fused dorsal lobes. **G.** Corolla opened to show filaments connate at base. (From Clark & Folleco 8507, US.)



**FIG. 2.** *Columnea carinata*. **A.** Front view of flower showing fused dorsal lobes. **B.** Habit. **C.** Dorsal view of flower showing keel. **D.** Apex of shoot with single axillary flower. **E.** Lateral view of flower. (A, F from Clark & Folleco 8507, US; B–E from Clark et al. 8436, US.)

stout stems and terminally clustered leaves (e.g., *Columnnea lophophora* Mansf. and *Columnnea oblongifolia* Rusby). Elongate shoots and evenly spaced leaves are present in *Columnnea strigosa* Benth., but the flowers are more inflated, strongly bilabiate, and subtended by pedicels that often exceed the length of the leaves (> 10 cm). The slightly bilabiate and narrow corolla tube and relatively shorter pedicels (< 5 cm) easily differentiate *Columnnea carinata* from the latter. The presence of a dorsal keel on the corolla tube is present in other species of *Columnnea* (e.g., *Columnnea tulae* Urb. and *Columnnea incarnata* C. V. Morton), but it is not as prominent as in *Columnnea carinata*. The fusion of the upper two corolla lobes in *Columnnea carinata* is more pronounced (Fig. 2A) than other species that are strongly to weakly bilabiate. It is not clear which species are most closely related to *Columnnea carinata* because the combination of vegetative and reproductive characters is remarkably different from other known species. Future studies will play in an important role in understanding the phylogenetic placement of this enigmatic species.

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