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Article in *Phytotaxa* · October 2017

DOI: 10.11646/phytotaxa.323.3.7

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## *Cremspermopsis galaxias* (Gesneriaceae), a new species from northwestern Colombia

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### Abstract

*Cremspermopsis galaxias*, a new species from the eastern slopes of the Central Cordillera in the department of Antioquia, Colombia, is described and illustrated. Morphological affinities with its congeners are discussed, and a dichotomous key is provided to identify the three species of *Cremspermopsis*. The new species is distinguished by the presence of obovate bullate leaves with large white spots on the bullae, tomentulose inflorescence bracts, and calyx lobes with scattered short glandular trichomes.

### Introduction

The Gesneriaceae is represented in the Neotropics by ca. 1200+ species (Weber *et al.* 2013; Möller & Clark 2013) with the highest diversity found in Colombia with 356 species (Clavijo *et al.* 2016), followed by Ecuador and Brazil. The genus *Cremspermopsis* L.E. Skog & L.P. Kvist (2002: 264) was recently described and remains one of only two genera in the New World that has not been phylogenetically evaluated using molecular sequence data (the other genus is *Lampadaria* Fueillet & L.E. Skog (2003: 344)). The generic description by Skog and Kvist (2002) made note of its endemic distribution in the northern Central Cordillera of Colombia (departments of Antioquia and adjacent Bolívar). A disjunct population of *Cremspermopsis parviflora* L.E. Skog & L.P. Kvist (2002: 267) was discovered in the Amazonas Department (Bagua Province, Distrito Imaza, Región del Marañón) of northern Peru in 1995 (E. Rodríguez *et al.* 266; HUT!). The disjunct distribution of *Cremspermopsis* in Ecuador and Peru is noteworthy and future collecting in isolated regions of the eastern Andes in Ecuador will hopefully result in the discovery of additional populations.

The generic description of *Cremspermopsis* (Skog and Kvist 2002) recognized two species. One was a recent discovery and the second species was a new combination. The new combination was for *Cremspermopsis cestroides* (Fritsch 1934: 962) L.E. Skog & L.P. Kvist (2002: 265), which was transferred from *Cremsperma cestroides* (Fritsch) Benth (1846: 348). The second species, *Cremspermopsis parviflora* L.E. Skog & L.P. Kvist (2002: 267), was a recent discovery whose basionym was included in the generic description of *Cremspermopsis*.

Skog and Kvist (2002) circumscribed *Cremspermopsis* by the presence of inflorescence bracts, unequal calyx lobes and spherical papillate seeds. *Cremspermopsis* and *Cremsperma* are morphologically similar because they share characters such as an erect habit, connate calyx lobes and filaments adnate to the corolla tube. The main difference between *Cremspermopsis* and *Cremsperma* is the presence of bracts in the former and absence of bracts in the latter.

Skog & Kvist (2002) did not assign *Cremspermopsis* to a tribe, but suggested that it could belong to either Beslerieae or Napeantheae. The morphological similarities of *Cremspermopsis* and *Cremsperma* suggest that it belongs in the tribe Beslerieae, however the absence of bracts in this tribe is an important feature that makes the classification of *Cremspermopsis* without molecular data conjectural. A recent classification of Gesneriaceae (Weber *et al.* 2013) recognized *Cremspermopsis* as a member of the Beslerieae because the papillate seed surface is similar to the pustulate seed surface in *Tylopsacas* Leeuwenberg (1960: 220). Weber *et al.* (2013) further classified the Beslerieae into the subtribes Besleriinae and Anetanthinae and included *Cremspermopsis* in the latter. Ongoing phylogenetic studies of New World Gesneriaceae will include tissue samples of *Cremspermopsis* to evaluate its placement in the tribe Beslerieae.

Recent expeditions to northwestern Colombia resulted in the discovery of a new species of *Cremospermopsis*. The new species was also collected in 1987 by Hans Wiehler (*H. Wiehler et al.* 8756; SEL, US) who considered it to be a new genus (Wiehler 1987). Field notes by Hans Wiehler and review of his field collections made it possible to visit the same locality in 2012, and collect the new species. Outlined below are keys, plates for all three species of *Cremospermopsis*, and the description of a new species.

## Taxonomy

### *Cremospermopsis galaxias* J.L. Clark & Clavijo, *sp. nov.* (Figs. 1 & 2)

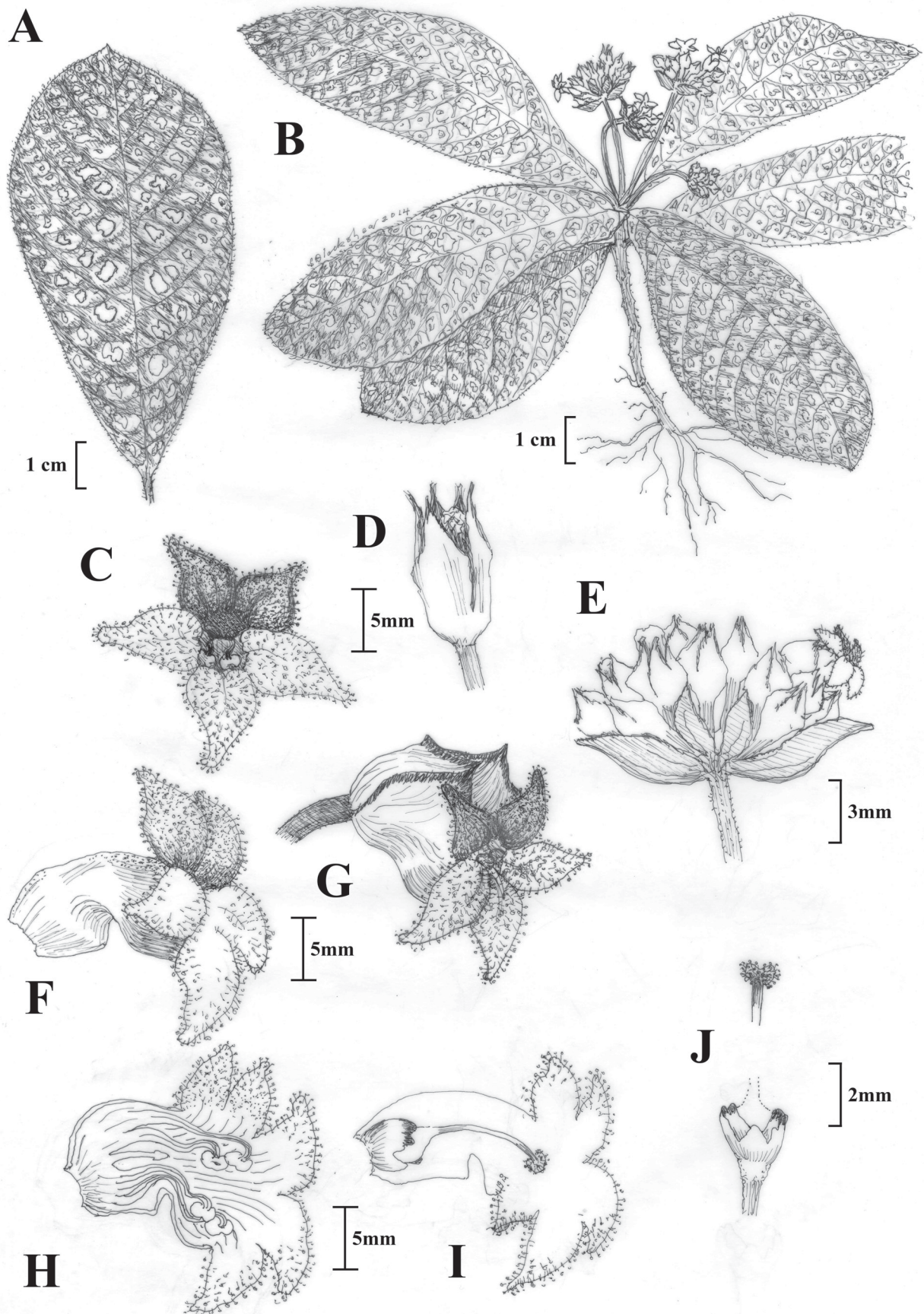
Differs from other congeners by obovate leaf blades with ciliate margin; bullate leaf surface with white large white spots on the bullae; peduncle glabrate; inflorescence bracts tomentulose; and glabrate calyx with scattered short glandular trichomes abaxially.

Type:—COLOMBIA. Antioquia: Municipio San Luis, Eastern Slopes of the Cordillera Central. Small trail near bridge over Quebrada Josefina along Highway Medellín–Bogotá, 5°58'22"N, 74°54'41"W, 838 m, 13 May 2012 (fl), *J.L. Clark et al.* 12890 (holotype COL!, isotypes HUA!, MO!, NY!, US!, UNA!).

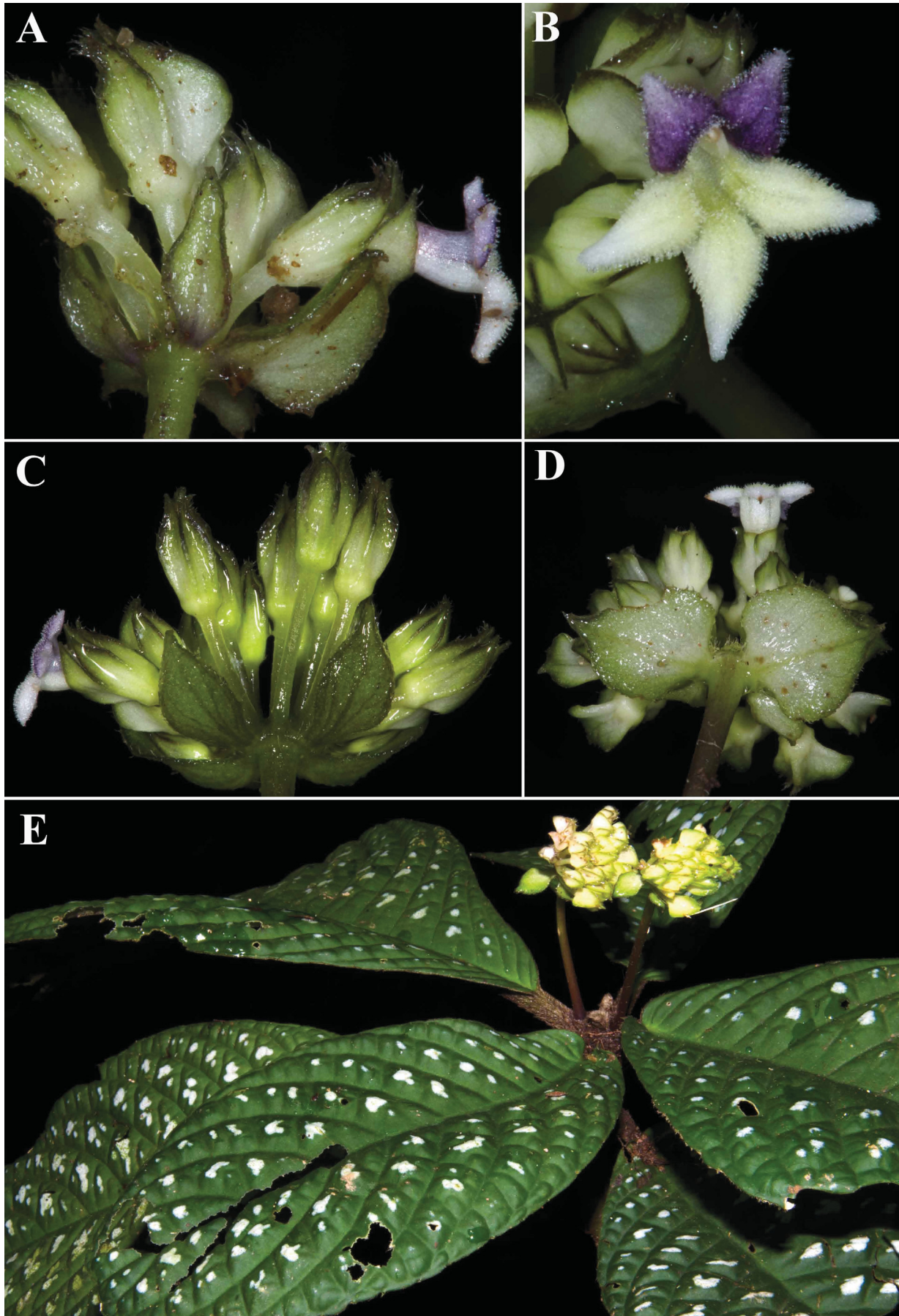
Terrestrial herb. **Stems** erect, to 15 cm tall, unbranched, brownish, sometimes with adventitious roots, glabrate basally and tomentose apically; internodes 0.2–2.3 cm long. **Leaves** opposite, decussate, equal in a pair, pairs grouped apically; petiole 0.4–1.6 cm long, terete, green, tomentose; blade obovate, 8–12 (20.5) × 3.4–10.5 cm, chartaceous when dry, bullate, upper surface green with large white spots on the bullae, lower surface light green, apex rounded to acute, base cuneate to slightly cordate, margin ciliate, upper surface glabrous, lower surface glabrate; 7–10 pairs of main lateral veins, venation impressed above and raised below, glabrous above and tomentose below, higher order of venation more evident abaxially. **Inflorescence** axillary or terminal, a congested umbel-like cyme with (4)8–32 flowers per inflorescence; peduncle 3.8–6.4 cm long, green suffused with maroon to completely maroon, glabrate with a tuft of hairs between the larger bracts; 4 inflorescence bracts located at the apex of the peduncle, 2 larger than the other 2, 6–9 × 4–8.5 mm, light green with the margin darker, ovate, the wider bracts concave, apex acute to acuminate, margin subentire, tomentulose; inflorescence rachis sometimes elongated, 5–10 mm long; pedicel 2.8–9.7 mm long, light green, glabrous. **Calyx** light green with the margin dark green; calyx lobes 5, unequal, 2 ventral lobes wider than the other 3, lobes connate most of their length, 4.3–7 × 1.6–4.5 mm, narrowly to broadly ovate, apex acute, margin entire, revolute, base truncate, both surfaces glabrate with scattered small glandular trichomes, and some long trichomes along the margin. **Corolla** zygomorphic, oblique relative to the calyx; tube nearly hidden by the calyx, tubular, 4.4–6 mm long, 1.7–1.9 mm wide at the base, narrowing to 1 mm, and widen to 3 mm distally, outer surface white in the proximal half and white with lavender in the distal half, outer and inner surfaces glabrous; throat 3–3.3 mm wide, inside with scattered small glandular trichomes; corolla lobes 5, subequal, 2 dorsal lobes slightly smaller than the other 3, ovate, apex acuminate, margin entire, revolute, densely glandular hairy adaxially, glabrous abaxially, dorsal lobes lavender, 1.9–2 × 2 mm, lateral and ventral lobes white, 2.9–3.3 × 2–2.5 mm. **Androecium** of 4 stamens, didynamous, filaments adnate to the corolla tube for 1.5–1.8 mm, above free for 0.6–1.9 mm, glabrous, coiling after anthesis; anthers oblong, 0.6–0.8 × 0.3–0.5 mm. **Gynoecium** with an irregular annular nectary gland that is slightly taller on opposing sides of the ovary and shorter on alternating opposing sides of the ovary, 0.8–1.5 mm long; ovary superior, 1.5–2 × 1–2 mm, globose, glabrous; style 3–3.4 mm long, glabrate; stigma stomatomorphic and covered with glandular trichomes. **Fruit** a capsule, 4–5 × 3–3.5 mm.

**Paratype:**—COLOMBIA. Antioquia: along road from cañón of Río Claro west, ca., 25 km west of Río Claro, 12 km west of La Josefina, 23 Mar 1987, *H. Wiehler with GRF study group* 8756 (SEL, US).

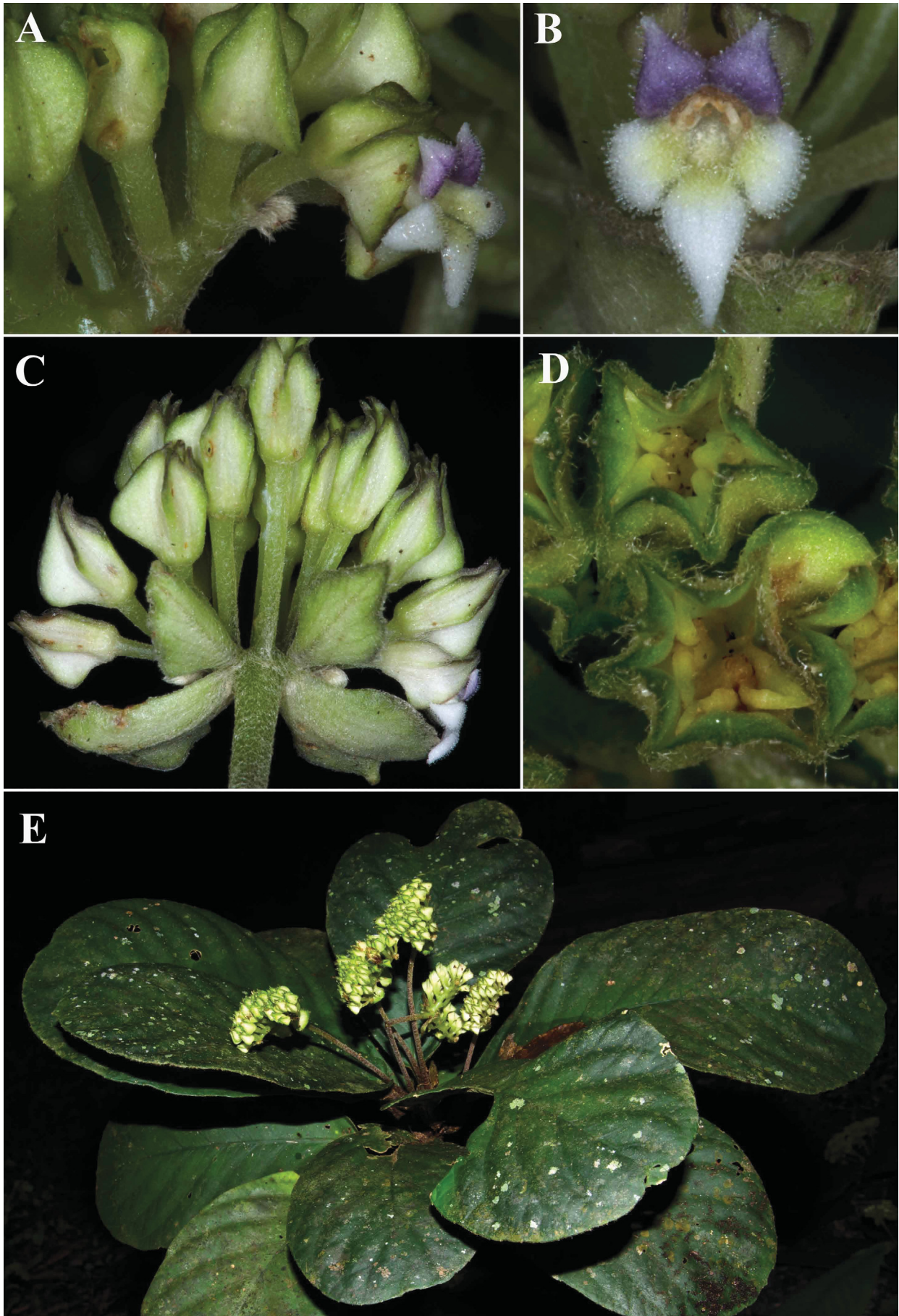
*Cremospermopsis galaxias* and *C. parviflora* are readily differentiated from *C. cestroides* (Fig. 4). Both species have calyx lobes that are connate, unequal and corolla lobes covered with glandular trichomes (Figs. 2 & 3). A paratype of *Cremospermopsis galaxias* (*H. Wiehler et al.* 8756) was previously identified as *C. parviflora*. Dried herbarium specimens of *Cremospermopsis parviflora* and *C. galaxias* resemble each other because the bullae and large white spots are not preserved on herbarium specimens in the latter. A field expedition (Clark 2012) resulted in studying both species and they are readily differentiated through vegetative and reproductive characters. The bullate leaves and large white spots are the most distinguishing character of *C. galaxias* (Figs. 1 & 2). Additional characters that distinguish *C. galaxias* are leaf blades with ciliate margin, tomentulose inflorescence bracts and glabrate calyx lobes with scattered glandular trichomes.



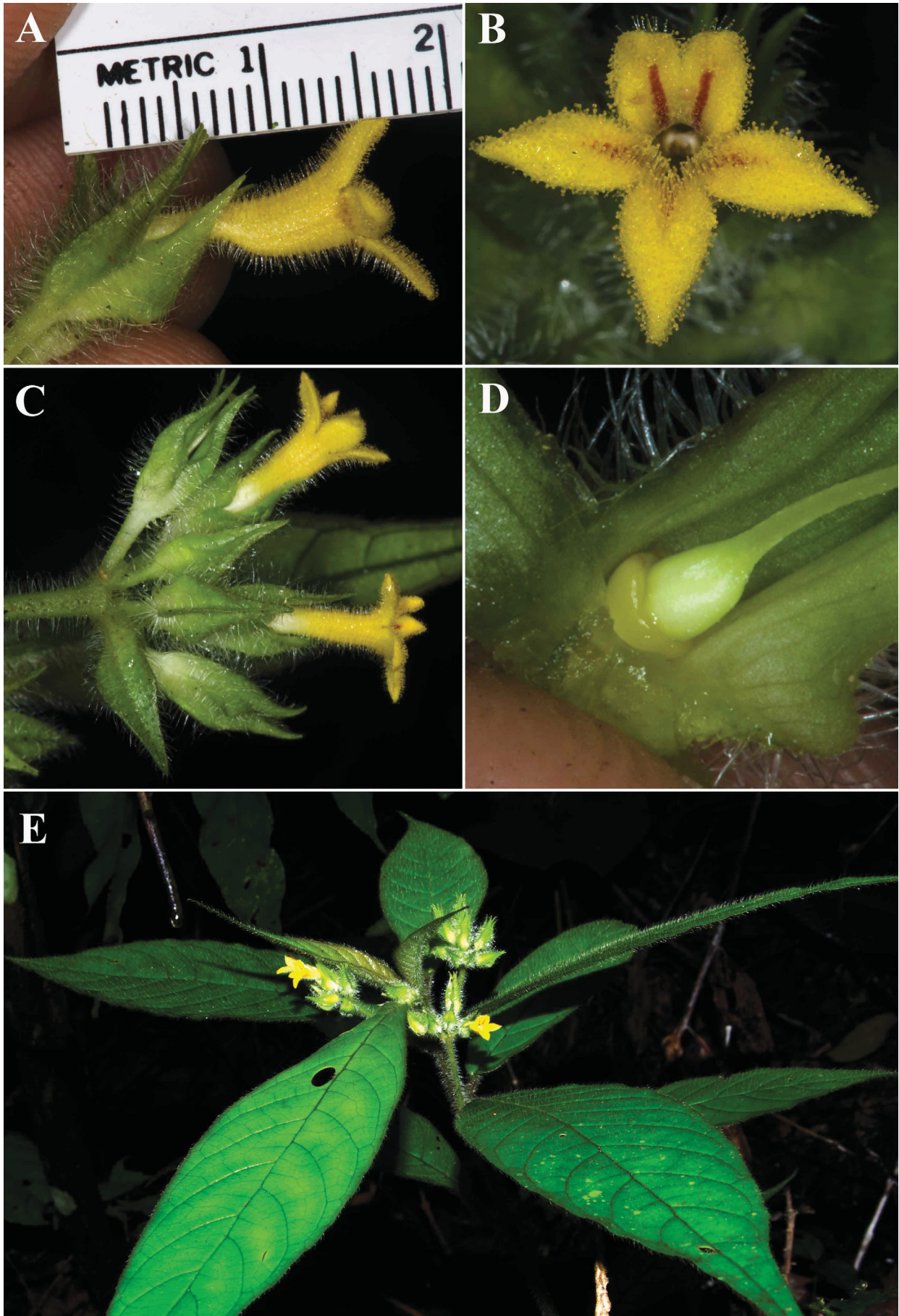
**FIGURE 1.** *Cremospermopsis galaxias*. A. Bullate leaf surface with large white spots on bullae. B. Habit. C. Front view of flower. D. Calyx. E. Inflorescence with bracts. F. Lateral view of corolla. G. Lateral view of calyx and corolla. H. Lateral view of opened flower showing androecium and staminode. I. Lateral view of opened flower showing gynoecium. J. Gynoecium showing annular nectary and stigma (from the holotype, *J.L. Clark et al. 12890*).



**FIGURE 2.** *Cremospermopsis galaxias*. A. Lateral view of inflorescence showing bracts. B. Front view of a flower. C. Lateral view of inflorescence showing pairs of bracts. D. Lower view of larger pair of inflorescence bracts. E. Habit showing bullate leaf surface with large white spots on bullae (from the holotype, *J.L. Clark et al.* 12890).



**FIGURE 3.** *Cremospermopsis parviflora*. A. Lateral view of corolla. B. Front view of flower. C. Lateral view of inflorescence showing paired bracts. D. Upper view of mature fruits. E. Habit (A, D & E from *J.L. Clark et al. 12898*; B & C from *J.L. Clark et al. 12912*).



**FIGURE 4.** *Cremospermopsis cestroides*. A. Lateral view of a flower. B. Front view of a flower. C. Lateral view of inflorescence showing paired bracts. D. Annular nectary. E. Habit (from *J.L. Clark et al. 12900*).

**Etymology:**—The specific epithet, *galaxias*, is in reference to the combination of bullate leaf surfaces and large white spotting that resembles the Milky Way of our Solar System's galaxy.

**Distribution and habitat:**—*Cremospermopsis galaxias* grows in abundant and scattered populations of 30+ individuals in shady areas along streams. The vegetation is intact along the streams, but is mostly bordered by areas that are under cultivation (e.g., cow pastures and agriculture). It has been collected in one locality along the eastern slopes of the Central Cordillera in the department of Antioquia in a Montane forest.

**Distribution and habitat:**—This species has not been found in any formally protected area. According to the IUCN Red List criteria (IUCN 2001) for limited geographic range (B2a, less than 10 km<sup>2</sup> and known to exist at only a single location) and considering the uncertain future of habitat conservation of the type locality, *Cremospermopsis galaxias* should be listed in the category CR (Critically Endangered).

### Key to the species of *Cremospermopsis*

1. Herb or shrub to 2 m tall; leaves oblanceolate or less commonly elliptic, apex acuminate; corolla tube not hidden by the calyx lobes, outside and distally glandular pilose to villous; corolla lobes yellow or white with pink or violet markings..... *C. cestroides*
- Herb to 60 cm tall; leaves obovate or less commonly elliptic, apex obtuse, rounded, occasionally acute; corolla tube partially to mostly hidden by the calyx lobes, outside glabrous; dorsal corolla lobes lavender, lateral and ventral lobes white or yellow.....2
2. Leaves bullate, adaxially with white spots on the bullae, margin ciliate; peduncle glabrate; inflorescence bracts tomentulose; calyx glabrate with scattered short glandular trichomes abaxially ..... *C. galaxias*
- Leaves not bullate, adaxially uniformly green, margin remotely serrate to subentire; peduncle pilose; inflorescence bracts tomentose; calyx pilose to tomentose abaxially ..... *C. parviflora*

### Acknowledgments

Support for this project was provided by the National Science Foundation (DEB-0841958 and DEB-0949169 to JLC). We thank the following herbaria for access to their collections: Smithsonian Institution's National Museum of Natural History–Department of Botany (US), Missouri Botanical Garden (MO), Field Museum of Natural History (F), Marie Selby Botanical Gardens (SEL), University of Wisconsin (WIS), and National Herbarium of Colombia (COL). We thank Alvaro Idárraga (HUA) and Diego Suescún (MEDEL) for the logistic support for the 2012 Colombia expedition. We thank Christian Feuillet for help in selecting the specific epithet. Sue Blackshear is gratefully acknowledged for the illustration.

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