

NEW SPECIES AND NOMENCLATURAL NOTES IN *CLUSIA* (CLUSIACEAE) FROM ANDEAN COLOMBIA AND VENEZUELA

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ABSTRACT

Continuing studies on the Clusiaceae for *Flora de Colombia*, and fieldwork to document the phytodiversity of Río Nambí Natural Reserve have revealed two new species, *Clusia bernardoii* Pipoly & Cogollo, and *C. tetragona* Pipoly & Cogollo. The new species are described, illustrated, and hypotheses of their phylogenetic positions are proposed. Corrections to bibliographic errors in citations for *Clusia* sect. *Oedematopus* and *Clusia* sect. *Havetiopsis* are provided. The new combination *Clusia comans* (Mart.) Pipoly is validated. Colombian and related Andean Venezuelan species formerly included in the genus *Oedematopus* are transferred to *Clusia*, necessitating the new combinations: *C. aristeguietae* (Maguire) Pipoly, *C. divaricata* (Cuatrec.) Pipoly, *C. epiphytica* (Cuatrec.) Pipoly, *C. mirandensis* (Cuatrec.) Pipoly.

RESUMEN

Estudios hacia un tratamiento taxonómico de la familia Clusiaceae para *Flora de Colombia* y para documentar la fitodiversidad de la Reserva Natural Río Nambí, revelaron dos especies nuevas para la ciencia, *Clusia bernardoii* Pipoly & Cogollo, y *C. tetragona* Pipoly & Cogollo. Se describen, se ilustran y se proponen hipótesis de parentesco para las nuevas especies. Errores bibliográficos previamente publicados para *Clusia* secciones *Oedematopus* y *Havetiopsis* se corrigen. La nueva combinación *Clusia comans* (Mart.) Pipoly se valida. Especies colombianas y venezolanas de la región Andina anteriormente consideradas como miembros del género *Oedematopus* se transfieren a *Clusia*, resultando en las nuevas combinaciones: *C. aristeguietae* (Maguire) Pipoly, *C. divaricata* (Cuatrec.) Pipoly, *C. epiphytica* (Cuatrec.) Pipoly, *C. mirandensis* (Cuatrec.) Pipoly.

INTRODUCTION

The genus *Clusia* contains approximately 300 species, of which nearly 17% remain undescribed. Fundamental taxonomic work by Panchon and

Triana (1860a, 1860b), Engler (1888, 1895), and Vesque (1892, 1893) form the basic framework which all modern studies have been based to date. Cuatrecasas (1949, 1950) was the first author of this century to critically reevaluate the Colombian members of the family, and in the two aforementioned papers, he described a total of 75 taxa. Most of the taxa described by Cuatrecasas belonged to the genus *Clusia* sensu stricto, but his work also included critical additions to the genera *Oedematopus* and *Clusiella* that left the circumscription of each significantly emended. Subsequently, Ewan (1951), Maguire (1951, 1977), Pipoly and Graff (1995a, 1995b), Pipoly (1997) and Pipoly and Graff (1995a, 1995b), described a number of new species. Pipoly et al. (1998), in their treatment of the family for *Flora of the Venezuelan Guayana*, relegated *Quapoya*, *Havetiopsis*, and *Oedematopus* (among other genera) to synonymy under *Clusia*. This paper is intended to describe novelties in *Clusia*, correct bibliographic errors in citation for sections *Havetiopsis* and *Oedematopus*, validate the new combination *Clusia comans*, and to complete the transferal of *Oedematopus* species to *Clusia*.

NOVELTIES IN *CLUSIA*

In the course of identification of herbarium materials for an analysis of the family for *Flora de Colombia*, the following new species were encountered.

***Clusia* (§ *Anandrogyno*) *bernardoii* Pipoly & Cogollo, sp. nov. (Fig. 1).**

COLOMBIA. CAUCA: Mpio. de Tambo, Parque Nacional Munchique, km 60–80 vía a la Galera, 1,850–2,150 m, 13 Apr 1995 (stam. fl), B. Ramírez, N. Rojas, L. Zambrano, N. Diago 7198 (HOLOTYPE: PSO; ISOTYPES: CAUP, JAUM).

Quoad filamenta numerosa omnino libera, ad apices emarginata, adque bases cordata, androphoros paucipraedita *C. sectio Anandrogyno* pertinet, sed ab species illis laminis oblongis vel peranguste oblanceolatis, nerviis secundariis numerosis ad apices truncatis vel late rotundatis hypododitsque indutis, secus margines revolutis necnon sepalis petalisque 4 perfacile cognoscitur.

Glabrous treelet to 5 m tall; latex unknown. *Branchlets* terete, 5–8 mm diam., swollen at the nodes 7–10 mm diam., the nodes short, 1.3–2 cm long, glabrous. *Leaves* sessile; blades coriaceous, oblong to narrowly oblanceolate, 17–23 cm long, 4.6–6.0 cm wide, apically truncate to broadly rounded, basally cuneate, midrib prominently raised above and below, the secondary veins brochidodromous, numerous, 70–80 pairs, prominulous above, scarcely visible below, the submarginal collecting vein like the secondaries, 1–2 mm from margin, drying smooth and dark green above, pallid below, the linear resin canals visible in the lower 1/3, and with scattered, minute rubiginous hydrotopes, the margin slightly revolute except prominently revolute in the basal 1/4 of leaf. *Staminate inflorescence* a terminal panicle of cymes, thrice-branched, and each subsequent branch divided 3 times; peduncle 3.7–4.7 cm long; inflorescence bracts cartilaginous, ovate, 7–10 mm long,

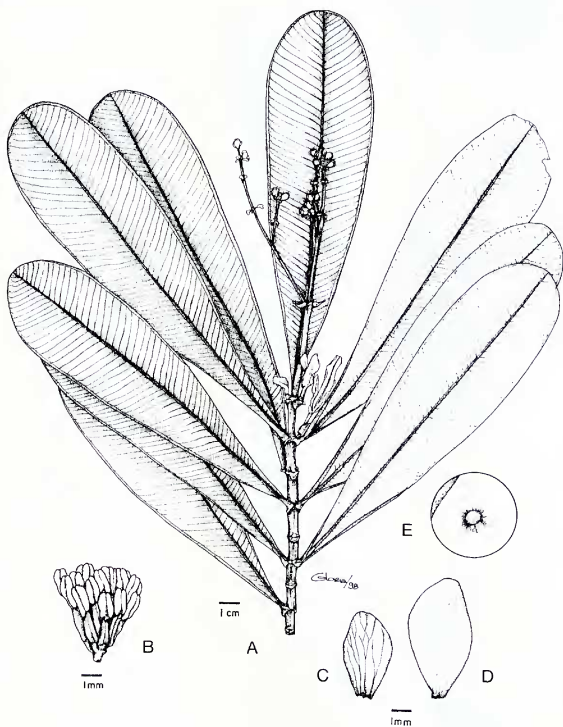


FIG. 1. *Clusia bernardoii* Pipoly & Cogollo. A. Branchlet, showing oblong to narrowly oblanceolate leaf blades. B. Androecium, showing poorly developed androphore and oblongoid anthers with emarginate apices. C. Sepal, showing asymmetry, and conspicuous venation. D. Petal, showing asymmetry and conspicuous venation. E. Abaxial leaf surface, showing hydrotome. A-D, drawn from holotype.

4.5–6.5 mm wide, apically obtuse, medially thickened but not carinate, the linear resin canals drying black, conspicuous, the margin scarious, entire; floral bracts 2, as in secondary inflorescence branch bracts except oblate, 1.8–2.2 mm long, 2.1–4.1 mm wide, apex widely rounded; bracteoles 2, chartaceous, oblate to deltate, 2.0–2.2 mm long, 3.8–4.2 mm wide, apex obtuse to acutish, medially keeled, the margin entire; pedicels obsolete. *Staminate flowers* 3 per cymule, whitish-green; sepals 4, decussate, membranaceous, oblong, 5.5–6.5 mm long, 3.1–3.5 mm wide, asymmetric, apically obtuse, cucullate, hyaline, the venation conspicuous, the margin entire; petals 4, decussate, oblong, 5.5–7.0 mm long, apically broadly rounded and asymmetrically notched, hyaline, the venation conspicuous, the margin irregular, entire; androphore poorly developed or obsolete, stamens 22–28, 2.0–3.5 mm long, free to the base, the filaments 1–1.5 mm long, the anthers oblongoid, 0.5–0.9 mm long, 0.5–0.7 mm wide, apically emarginate, basally subcordate, as wide as the filaments, dehiscent by wide longitudinal slits throughout their length; pistillode absent. *Pistillate inflorescence, flowers, and fruit* unknown.

Distribution.—Known only from the type.

Ecology and conservation status.—The type locality lies in a transitional zone between premontane pluvial forest and cloud forest, but no further details are known. While the species is known from Munchique National Park, encroachment is common and poses a threat to this species.

Etymology.—It gives me great pleasure to dedicate this striking new species to Biól. Bernardo Ramiro Ramírez Padilla, Herbarium Technician of the University of Nariño in Pasto, Colombia. Bernardo has worked indefatigably for over twenty years, documenting the complex, species-rich and biogeographically important flora of the Department of Nariño and adjacent areas, such as Cauca and Putumayo.

Clusia bernardoii is unique among members of *C.* section *Anandrogynae* because of its oblong to narrowly oblanceolate leaf blades bearing rubiginous hydropetes, and 4-merous perianth. Four-merous flowers are otherwise frequent among members of *C.* section *Criuva* (Pipoly, 1996), but the oblongoid anthers with emarginate apices and cordate bases, dehiscent by wide longitudinal slits leave no doubt that *Clusia bernardoii* is a member of *C.* section *Anandrogynae*, the largest and most complicated section of the genus.

***Clusia* (§ *Criuva*) *tetragona* Pipoly & Cogollo, sp. nov. (Fig. 2). COLOMBIA.**

NARIÑO: Mpio. Barbaças; Corregimiento Ortíz y Zamora; Vereda El Barro; Reserva Natural Río Nambí; ca. 5 km W de Altaquer, faldas occidentales de la Cordillera Occidental; 01° 18' N, 78° 08' W, 1,350–1,400 m. 3 Sep 1997 (bud. fr), *J. Pipoly, A. Cogollo, M. López, & M. Rodríguez 21198* (HOLOTYPE: PSO; ISOTYPES: BRIT, COL, FMB, JAUM, K, MO, NY, TULV).

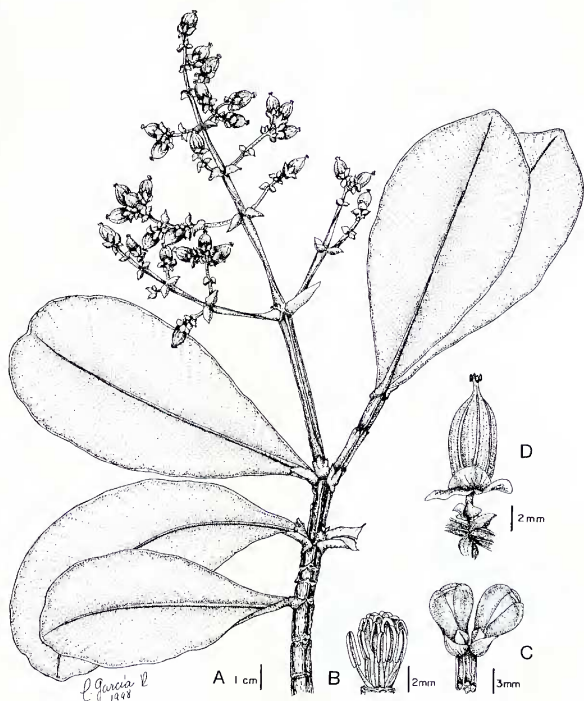


FIG. 2. *Clusia tetragona* Pipoly & Cogollo. A. Branchlet, showing tetragonal shape appearing alate, and subsessile leaves. B. Androecium, showing poorly developed androphore, free filaments, and mucous anthers. C. Flower buds, showing secondary inflorescence bracts and two of the four bracteoles. D. Fruit, showing rostrate apex. A-C, drawn from holotype. D, drawn from *J. Pipoly et al.* 21157.

Propter lamina obovata vel elliptica coriaceaue nervio submarginale prominente, inflorescentiam terminalem pyramido-paniculatam, petiolos marginatos necnon fructu rostrato, *C. garciabarrigae* valde arcte affinis, sed ab ea ramulis tetragonis (non teretibus), petioliis obsoletis vel usque ad 1.5 (non 2.5–4) cm longis, bracteis florinis 4 (non 2), sepalis suborbicularibus (non oblongis), denique fructibus 8–10(–13) (non 5–7) mm longis statim distinguitur.

Terrestrial tree to 25 m tall, and to 45 cm DBH; latex white. *Branchlets* tetragonal, subalate, (4–)5–7 mm diam., glabrous. *Leaves* decussate; blades coriaceous, obovate to elliptic, (9.5–)14.2–19 cm long, 4.5–6(–9.5) cm wide, apically broadly rounded to truncate, basally acute, midrib prominently raised above and below, the secondary veins numerous, 50–52 pairs, connected by a submarginal collecting vein ca. 2 mm from margin; linear latex canals not visible from above, rubiginous and conspicuous below, the margin entire, flat; petioles obsolete to broadly marginate, to 1(–1.5) cm long. *Staminate inflorescence* a bipinnate panicle, ca. 12 cm long, 10 cm wide; peduncle 4–4.5 cm long, tetragonal except drying flat in the upper portion; primary inflorescence bracts 2, cartilaginous, 11–13 mm long, 5.5–6.5 mm wide, apically obtuse, medially keeled, the margin scarious, entire; secondary inflorescence bracts acropetally smaller and similar, except the uppermost suborbicular, ca. 3 mm long and wide; pedicels obsolete to 0.5 mm long. *Staminate flowers* greenish white; bracteoles 4, cartilaginous, oblate, 2.5–3 mm long, 3–3.5 mm wide, apically acute to rarely subobtuse, prominently carinate medially, the margin entire, opaque, glabrous; sepals 4, membranous, hyaline, decussate, the outer suborbicular, 4.5–5.5 mm long, 3.5–4 mm wide, the inner oblong, 7–8 mm long, 3.5–4 mm wide, apically cucullate and broadly rounded, the linear latex canals conspicuous, the margin entire; petals 4, decussate, membranaceous, obovate-spathulate, 8–9 mm long, 4–5 mm wide, linear latex canals conspicuous, the margin entire; androphore poorly developed, to 1 mm high; stamens 32–36, 3–4.5 mm long, the filaments free, angulate 1–2 mm long, the anthers linear, each theca half the diameter of the connective, apically muticous, tapering basally into filament, dehiscent by narrow longitudinal slits 2–2.5 mm long; pistillode absent. *Pistillate flowers* similar to staminate except somewhat smaller (in bud); staminodes obsolete; pistil oblongoid, 3.5–4 mm long, ca. 2 mm wide, the stigmas 4, sessile, cuneiform, concave, 0.9–1.3 mm long, 0.9–1.1 mm wide, appearing to be borne on connivent styles at maturity, the apparent styles 1–1.2 mm long. *Fruit* ellipsoid, 8–10(–13) mm long, 4.5–6 mm wide, abruptly constricted to a small “beak” apically (rostrate).

Distribution.—Apparently endemic to the Barbacoas area, on the west-ern slopes of the Cordillera Occidental, in the Department of Nariño, Colombia, at 1,325–1,900 m elevation.

Ecology and conservation status.—*Clusia tetragona* is restricted to premontane pluvial and cloud forests, where it is found along forest margins.

Etymology.—The specific epithet, ‘tetragona’ refers to the tetragonal na-

ture of the branchlets when seen in transverse section.

Common names.—"Guandera" (Spanish).

PARATYPES. COLOMBIA. NARIÑO: Mpio. Barbacoas, Corregimiento Altaquer, Vereda El Barro, Reserva Natural Río Nambí, left bank of Río Nambí, 01° 18' N, 78° 04' W, 1,325 m, 11 Dec 1993 (fr), *P. Franco et al.* 5145 (COL, PSO); Corregimiento Ortiz y Zamora; Vereda El Barro; Reserva Natural Río Nambí; ca. 5 km W de Altaquer, faldas occidentales de la Cordillera Occidental; 01° 18' N, 78° 08' W, 1,350–1,400 m, 2 Sep 1997 (bud, fr), *J. Pipoly, A. Cogollo, M. López & M. Rodríguez* 21157 (BRIT, COL, FMB, JAUM, K, MO, PSO, TULV); Mpio. Ricaurte, La Planada, 1,900 m, 28 Nov 76 (stam. fl), *O. de Benavides* 730 (PSO), La Planada, 5 km S of Altaquer, 01° 10' N, 78° 00' W, 1,750 m, 22 Nov 1986 (fr), *B. Hammel & R. Bernal* 15802 (COL, MO, PSO); La Planada, 7 km de Chucunés, 01° 10' N, 77° 58' W, 1,800 m, 25 Sep 1989 (fr), *O. de Benavides* 10803 (MO, PSO), 18 Jan 1990 (fr), *O. de Benavides* 11337 (MO, PSO), 01° 05' N, 78° 01' W, 1,800 m, 22 Dec 1987 (fr), *A. Gentry & P. Keating* 59721 (MO, PSO); Trail to El Hondón, 5–12 km SW of La Planada, 01° 04' N, 78° 02' W, 1,750–1,800 m, 6 Jan 1988 (fr), *A. Gentry & P. Keating* 60474 (MO, PSO); Camino Las Cruces-Curucel, 01° 08' N, 77° 51' W, 1,700–1,800 m, 5 Nov 1995 (fr), *B. Ramirez, M. González & A. Muñoz* 8692 (BRIT, PSO).

Because of its obovate to elliptic, coriaceous leaves, with a prominent submarginal collecting vein, terminal pyramidal-paniculate inflorescence, and rostrate fruit, *Clusia tetragona* is most closely related to *C. garciabarrigae* Cuatrecasas. However, *Clusia tetragona* is immediately separated from that species by the tetragonal branches, appearing alate when dried, sessile to short-petiolate leaves, more numerous floral bracteoles, suborbiculate sepals and much longer fruits. While *Clusia tetragona* is apparently sympatric with *C. garciabarrigae*, it is notable that *C. tetragona* is restricted to more open habitats than *C. garciabarrigae*. Clearly, more fieldwork is needed to understand the population biology of these species.

NOTES ON *CLUSIA* SECTIONS *OEDEMATOPUS* AND *HAVETIOPSIS*

In our recent treatment of this section for the Venezuelan Guayana (Pipoly et al. 1998), we inadvertently missed the first publication of the basionyms, *Oedematopus* Planch. & Triana, and *Havetiopsis* Planch. & Triana, and cited them as "Ann. Sci. Nat., Bot. ser. 4, 14:249. 1860," for *Oedematopus* and "Ann. Sci. Nat., Bot. ser. 4, 14:246. 1860" for *Havetiopsis*, where complete descriptions of the genera were presented, followed by descriptions of all infrageneric taxa. However, Planchon and Triana had first published the two generic names, with diagnoses inside a synoptic key, for the first time in the previous volume, published in the same year. For my relegation of *Pilosperma* Planch. & Triana to synonymy under *Clusia*, I (Pipoly 1997) cited "Ann. Sci. Nat., Bot ser. 4, 13:315. 1860," which was correct. Because the citations for *Oedematopus* and *Havetiopsis* only involve bibliographic errors (ICBN, Art. 33.3), the combinations are valid, but should be cited as follows:

Clusia L. sect. **Oedematopus** (Planch. & Triana) Pipoly in Steyermark, Berry & Holst, Fl. Venez. Guayana 4:269. 1998. *Oedematopus* Planch. & Triana, Ann. Sci. Nat., Bot. ser. 4, 13:315. 1860. TYPE: *Havetia octandra* Poepp. & Endl., Nov. Gen. Sp. 3:11. t. 209A. 1840 (LECTOTYPE, by Pipoly 1998). = *Clusia octandra* (Poepp.) Pipoly, Fl. Venez. Guayana 4:276. 1998.

Clusia L. sect. **Havetiopsis** (Planch. & Triana) Pipoly in Steyermark, Berry & Holst, Fl. Venez. Guayana 4:269. 1998. *Havetiopsis* Planch. & Triana, Ann. Sci. Nat., Bot. ser. 4, 13:315. 1860. LECTOTYPE SPECIES, here designated: *Clusia flavida* (Benth.) Pipoly, based on *Havetia flavida* Benth., London J. Bot. 2:369. 1843.

When relegating *Renggeria* to synonymy under *Clusia*, we (Pipoly et al. 1998), cited the basionym "*Renggeria comans* Meisn., Pl. Vasc. Gen., Commentarius 42. 1837." However, Meisner did not make a new combination on that page; he merely published the name of a new genus there, without listing any species. Therefore, the correct basionym was not cited and according to ICBN Art. 33.2, the combination is invalid. The new combination, citing the correct basionym is made herewith:

Clusia comans (Mart.) Pipoly, comb. nov. *Schweiggeria comans* Mart., Nov. Gen. Sp. Pl. 3:166. 1832. *Quapoya comans* (Mart.) Planch. & Triana, Ann. Sci. Nat. Bot. ser. 4, 14:239. 1860. *Renggeria comans* (Mart.) Meisn. ex Engl. in Mart., Fl. Bras. 12 (1):441. 1888.

Even though the generic name *Schweiggeria* Mart. (non Spreng.) is a later homonym, the binomial is legitimate, as per ICBN Art. 55.1.

In the treatment of the genus *Clusia* for *Flora of the Venezuelan Guayana*, (Pipoly et al. 1998), and subsequently (Pipoly 1997), we transferred a number of Andean species from *Oedematopus* to *Clusia*, but did not transfer the Andean species from Colombia and Venezuela, pending review of available material. Now that I have seen types and other material of these species, here I transfer the remainder of the species formerly in *Oedematopus*, to *Clusia* sect. *Oedematopus*, herewith.

Clusia aristeguietae (Maguire) Pipoly, comb. nov. *Oedematopus aristeguietae* Maguire, Bol. Soc. Venez. Ci. Nat. 25:228. 1964.

Clusia divaricata (Cuatrec.) Pipoly, comb. nov. *Oedematopus divaricatus* Cuatrec., Anales Inst. Biol. Univ. Nac. Mexico 20:108. 1949.

Clusia epiphytica (Cuatrec.) Pipoly, comb. nov. *Oedematopus epiphyticus* Cuatrec., Revista Acad. Colomb. Ci. Exact 8 (29):61. 1950.

Clusia mirandensis (Cuatrec.) Pipoly, comb. nov. *Oedematopus mirandensis* Maguire, Bol. Soc. Venez. Ci. Nat. 25:230. 1964.

ACKNOWLEDGMENTS

This work results from studies supported by a generous grant from the

National Geographic Society, 5575-95, for exploration of the Parque Nacional Natural Las Orquídeas, followed by the same at Reserva Natural Río Nambí. We thank Bernardo Ramírez (PSO) for his technical assistance, as well as the administration of FELCA (Fundación Ecológica de los Colibrís de Altaquer), Marcial Bisbicuz, and Maruricio Flores. Ramiro Fonnegra, Director of HUA, graciously made the services of Gloria Mora and Consuelo García available to us to prepare the line illustrations, for which we are most grateful. Logistical help from Juan Guillermo Ramírez and Adriana Gómez (JAUM) greatly facilitated our work.

We are also very grateful to K. Gandhi (GH) for bringing the bibliographic errors in the *Flora of the Venezuelan Guayana* treatment to the attention of Pipoly. Gandhi's thorough and meticulous work is most appreciated. The additional comments by D. Nicolson (US) did much to improve the quality of the paper, for which we are most thankful.

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