NOVELTIES IN DILLENIACEAE FROM ECUADOR

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Abstract. A new species was detected during the examination of specimens of *Doliocarpus* for the Flora of Ecuador, which is is described and its morphological relationships with its closest allied species are discussed. *Doliocarpus renneri*, from the wet riverine forests of the Cuyabeno (Napo) river, is most similar to *D. multiflorus*, but differs from that species in its branches, branchlets and petioles covered by black trichomes, the obovate or elliptic-obovate leaves, the shorter inflorescence, the sessile flowers, and the sepals and petals that differ in shape and number. A previously described subspecies is elevated to the rank of species (i.e., *Doliocarpus dasyanthus* subsp. *robustus* to *D. robustus*), and an updated key to the species of *Doliocarpus* of Ecuador is provided.

Keywords: Flora of Ecuador, Amazonia, Dilleniaceae, *Doliocarpus*

Resumen. Durante el estudio de los especímenes de *Doliocarpus* para la Flora de Ecuador se descubrió una nueva especie, la cual se describe y se discuten sus afinidades morfológicas con la especie más afin. Este nuevo taxon, *Doliocarpus renneri*, se conoce de los bosques húmedos ribereños del Río Cuyabeno (Napo), esta especie es similar a *D. multiflorus* Standl., pero difiere de esta por sus ramas, ramitas y pecíolos cubiertos por tricomas negros, las hojas obovadas o eliptico-obovadas, las inflorescencias más cortas, las flores sésiles, y los sépalos y pétalos diferentes en número y forma. Se eleva a una subespecie al rango de especie (i.e., *Doliocarpus dasyanthus* subsp. *robustus a D. robustus*) y se incluye una clave actualizada de las especies del género *Doliocarpus* para Ecuador.

Doliocarpus Rolander (Dilleniaceae) includes about 50 species distributed throughout southern Mexico, Central America, the Antilles, the Guianas, Venezuela, Colombia, Ecuador, Peru, Bolivia, Brazil, and Paraguay (Aymard, 1998). The species are lianas (rarely shrubs) and, within the family, the genus is distinguished by having ramiflorous, fasciculate or glomerate inflorescences, an unicarpellate, one-celled ovary, a berry as a fruit, sometimes opening irregularly, and seeds completely covered by a white aril (Todzia and Aymard, 2013).

The genus was monographed by Kubitzki (1971), who divided it into two sections: section *Calinea* Eichler, characterized by having leaves with tertiary nerves subparallel (rarely reticulate), erect-flexuose filaments with introrse anthers at anthesis, and a glabrous or pilose ovary, and section *Doliocarpus* having leaves with tertiary nerves reticulate, reflexed filaments with anthers extrorse at anthesis, and ovary always pilose. Although the stamen character state (filaments at anthesis) represents a reliable morphological feature when assigning specimens of *Doliocarpus* to these two sections, it is usually the case that most specimens do not have flowers at anthesis, or have flowers lacking petals, many having instead young fruits with persistent sepals and stamens. Leaf venation, therefore, is perhaps the most valuable character to distinguish the two sections of this genus.

Doliocarpus renneri Aymard *sp. nov*. TYPE: ECUADOR. Napo Province: Río Cuyabeno, from mouth and two hours upstream, wet forest, 00°10'S; 75°53'W, 300 m, 16 August 1981, *J. Brandbyge, E. Asanza C., L. Werling & S. Leth-Nielsen 33583* (Holotype: QCA; Isotypes: AAU [not seen], GB, MO, NY, US). Fig. 1.

This new species is morphologically similar to *D. multiflorus* Standl., but it differs by having branches, branchlets and petioles covered by black, 1–1.5 mm long trichomes, obovate or elliptic-obovate leaves, the margins of which are sinuate, ciliate, and the apex acuminate, inflorescence 1–1.5 cm long, pilose; sessile flowers, sepals 4, 1.5–2 mm long, orbicular, petals 3, and a glabrous and papillate ovary.

Plant a liana; *branches and branchlets* densely hispid-setose, covered by black, 1–1.5 mm long trichomes, sparsely pilose or, glabrescent when mature. *Leaves* subcoriaceous, obovate or elliptic-obovate, 11–23 × 5–13 cm, the base cuneate, the apex acuminate, margins not revolute, entire, sinuate, mostly in the upper half, ciliate, with trichomes 1–1.5 mm long, sparsely appressed pubescent on the upper surface, more evident along the midrib and the secondary nerves, where its are covered by appressed trichomes, becoming glabrous when mature, appressed short pubescent on the lower surface, except along the midrib and the secondary nerves, where its are covered by long trichomes, 1–1.5 mm long, lateral nerves 7–13, petioles 1.5–2 cm long, 2-3 mm wide, exalate, canaliculate covered with black trichomes, 1.5-2 mm long. *Inflorescence* axillary, racemose, 1–1.5 cm long, rachis pilose, trichomes white, bracteoles ovate, 1–1.5 × 1–1.5 mm, sparsely appressed pubescence externally, glabrous internally. *Flowers* sessile, *sepals* 4, 1.5–2 x 1.5–2 mm, orbicular, sparsely appressed pubescent externally, glabrous internally, *petals* 3, 1.5–2 mm long, obovate, glabrous on both surfaces, *stamens* 20–40, filaments glabrous, 0.8–1 mm long, anthers glabrous, ca. 0.5 mm long; ovary glabrous, striate, papillate, style glabrous, papillate, ca. 0.5 mm long, stigma capitate. *Fruit* not seen.

Eponymy. This species is named in honor of Susanne Renner for her noteworthy contributions to our knowledge to the Flora of Ecuador, and to tropical botany at large.

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FIGURE 1. *Doliocarpus renneri* Aymard. Photograph by N. Cuello based on an isotype (NY).

Distribution and Ecology. Known only from the type locality, where it has been collected in riverine wet forests from the Río Cuyabeno.

Because of its subparallel tertiary venation, *Doliocarpus renneri* belongs in section *Calinea* (Kubitzki, 1971), and by its racemose inflorescence this new species is most similar to *D. multiflorus* Standl. from Central America, Venezuela, Suriname, Colombia, Ecuador, Peru, Bolivia, NE of Brazil (Maranhao, Pará, and Roraima; (Aymard, unpublished data). However, *D. renneri* differs from the latter in its branches, branchlets and petioles covered by black trichomes, 1–1.5 mm long (versus white trichomes, ca. 0.5 mm long), leaves obovate or elliptic-obovate, margins sinuate, ciliate, the apex acuminate (versus obovate-lanceolate, margins mucronate-serrate, not ciliate, apex obtused or rounded), inflorescence 1–1.5 cm long, pilose (versus 1.5–4, laxe pilose to glabrescent); flowers sessile (versus pedicellate), sepals 4, 1.5–2 mm long, orbicular (versus 4–5, 2–4 mm long, obovate or obovate-oblong), petals 3 (vs. 3–5), ovary glabrous and papillate (versus villose not papillate).

The specimen *J. Brandbyge et al. 33583* was previously referred to *D. hispidus* Standl. & L. O. Williams. However, the latter differs from the new species in its branches, branchlets and petioles being covered by white trichomes (versus black trichomes), leaves broadly elliptic to elliptic-obovate, margins in the upper half of the leaf blade dentate (vs. obovate or elliptic-obovate, margins sinuate); inflorescences fasciculate (versus racemose), bracteoles coriaceous (versus papyraceous), and sepals broadly ovate to suborbicular, densely yellow hispid-pubescent externally (versus orbicular, sparsely appressed pubescent externally).

Doliocarpus robustus (Aymard) Aymard, *comb. et stat. nov.*
Basionym: *Doliocarpus dasyanthus* Kubitzki subsp. *robustus* Aymard, Novon 3: 319. 1993. TYPE: PANAMA: Panama: along El Llano to Carti road, 09°15'N; 79°00'W, 150–250 m, 15 December 1987, *G. McPherson 11862* (Holotype: MO).

Doliocarpus robustus was described, based on a single specimen, as a subspecies of *D. dasyanthus* (Aymard, 1993). However, the examination of additional material strongly indicates that it should be treated as a separate species, which can be distinguished from *D. dasyanthus* using the following key:

1a. Leaves coriaceous, oblanceolate, 9–15 cm wide, secondary veins 16–22; petioles stout, 3–5 cm long, 4–6 mm wide, peduncle 2–3 mm wide; sepals oblong–elliptic, 8–12 mm long, ovary 4–8 mm long . . . . . *D. robustus* (Aymard) Aymard
1b. Leaves chartaceous to subcoriaceous, obovave–oblong, 3–8 cm wide, secondary veins 11–14; petioles slender, 1–2 cm long, 1–2.5 mm wide, peducle ca. 0.5 mm wide; sepals elliptic, 4–6 mm long, ovary 2–4 mm long . . . . . *D. dasyanthus* Kubitzki

Additional specimens examined: COSTA RICA. Heredia: Sarapiquí, Lomas Sardinal, 15 km N of Pto. Viejo, 10°34'N, 84°02'W, *B. Hammel 20632, 20679* (INB, F, MO). COLOMBIA. Valle del Cauca: 18 km NW of Buenaventura, 3.4 km NW of San Isidro intersection, 03°48'N, 77°08'W, *D. Faber-Langendoen & J. A. Hurtado 1561* (MO). Buenaventura, Corregimiento Córdoba, Vereda San Cipriano, Reserva Natural Escalerete, 03°49'41"N, 76°52'10"W, *Wilson Devia A. et al.* 5436 (MO). ECUADOR. Napo: The Yasuní National Park, 00°40'S, 76°24'W, *Jacob Nabe-Nielsen 285* (AAU, MO). Sucumbios: Estación Científica Cuyabeno, 220 m, J. *Jaramillo & E. Grijalva 14764* (MO, QCA).

The new species and the new status proposed here increase to ten the number of *Doliocarpus* species known from Ecuador, all discovered during the preparation of the treatment of Dilleniaceae for the Flora of Ecuador.

KEY TO THE SPECIES OF *DOLIOCARPUS* TO ECUADOR (BASED IN AYMARD, 2007)

1a. Tertiary venation reticulate; leaves with verrucosities on lower surface 2
1b. Tertiary venation subparallel; leaves without verrucosities on lower surface. 4
2a (1a). Lateral nerves terminating at the margin; sepals glabrous externally; fruits covered by trichomes 0.3-1 mm long . . . . . .*D. olivaceus* Sprague & L. O. Williams (Los Ríos)
2b. Lateral nerves linking close to the margin; sepals adpressed pilose externally; fruits covered by trichomes ca. 5 mm long 3
3a. Branches angulate; leaves shiny on the upper surface, glabrous on the lower surface; margins entire . . . . . .*D. nitidus* (Triana) Triana & Planchón (Esmeraldas)
3b. Branches terete; leaves dull on the upper surface, adpressed pubescent on the lower surface; margins sinuate to dentate . . . . . .*D. major* J. F. Gmel. (Manabí, Napo)
4a (1b). Inflorescences with peduncles 0.5–7 mm long . . . . . *D. brevipedicellatus* Garcke subsp. *brevipedicellatus* (Napo, Orellana)
4b. Inflorescences with peduncles longer than 10 mm 5
5a (4b). Inflorescences racemoses (peduncle with 2 to 6 flowers). 6
5b. Inflorescences, fasciculates, not racemoses (peduncle with a single flower) 8
6a (5a). Leaves rigid-coriaceous, oblanceolate-obovate or lanceolate, the margins entire or subsinuate; sepals elliptic . . . . . *D. novogranatensis* Kubitzki (Napo, Orellana, Pastaza)
6b. Leaves subcoriaceous, obovate-lanceolate obovate or elliptic-obovate, the margins sinuate or dentate; sepals orbicular, obovate or obovate-oblong 7
7a (6b). Branches, branchlets and petioles covered by white trichomes; leaves obovate-lanceolate, margins mucronate-serrate, not ciliate, apex obtused or rounded inflorescence 1.5–4 cm long; flowers pedicellate, sepals 2–4 mm long, obovate or obovate-oblong, ovary villose not papillate . . . . . .*D. multiflorus* Standl. (Napo, Pastaza Pichincha)
7b. Branches, branchlets and petioles covered by black trichomes; leaves obovate or elliptic-obovate, margins sinuate, ciliate, the apex acuminate, inflorescence 1–1.5 cm long, flowers sessile, sepals 1.5–2 mm long, orbicular, ovary glabrous . . . . . *D. renneri* Aymard (Napo)

KEY TO THE SPECIES OF *DOLIOCARPUS* TO ECUADOR (BASED IN AYMARD, 2007) CONT.

8a (5b). Sepals laxe pubescent to glabrescent on the outside; ovary glabrous 9
8b. Sepals pubescent on the outside, ovary densely sericeous 11
9a (8a). Stems, petioles, and leaf blades with spreading, ferrugineous pubescence . . . . . *D. dentatus* subsp. *rufescens* (Sleumer) Kub. (Napo)
9b. Stems, petioles, and leaf blades glabrous or with sparse, non- ferrugineous pubescence 10
10a. Leaves coriaceous, tuberculate along the leaves . . . . . *D. dentatus* subsp. *tuberculatus* Aymard (Napo, Pastaza, Sucumbios)
10b. Leaves chartaceous or subcoriaceous, not tuberculate along the leaves . . . . . *D. dentatus* (Aubl.) Standl. subsp. *dentatus* (Morona-Santiago, Orellana, Pastaza, Napo, Sucumbios, Zamora-Chinchipe)
11a (8b). Leaves coriceous, oblanceolate, margins sinuate-dentate; petioles 3–5 cm long; sepals 5 (6), sparsely pubescent inside . . . . . D. *robustus* Aymard (Sucumbios)
11b. Leaves subcoriceous, obovate, obovate-elliptic to elliptic, margins dentate or sinuate-crenate; petioles 1.5–3 cm long; sepals 3-4, glabrous inside . . . . . *D. subandinus* Aymard (Napo)

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