

A NEW SPECIES OF *DOLIOCARPUS*
(DILLENiaceae, DOLIOCARPOIDEAE) FROM THE AMAZON FORESTS
AND AN UPDATED KEY FOR THE COLOMBIAN SPECIES

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Abstract. *Doliosarpus daironii*, an endemic species to the Colombian Amazon forests, is described and increases to 25 the number of species of the genus recorded from this country. This new species shows certain similarities with *D. amazonicus*, *D. duckeanus*, and *D. guianensis*. Nonetheless, *D. daironii* is more related to *D. guianensis*, but differs from the latter in its branches, branchlets, leaves, inflorescence rachis, bracteole and sepal pubescence, leaf shape, and petiole and inflorescence size. A detailed description, comparisons with similar species, an illustration, and comments on its etymology, distribution, habitat, conservation status, and morphology are provided. Additionally, an updated key to the species of *Doliosarpus* of Colombia is also presented, and a previously described subspecies from Brazil is elevated to the rank of species (i.e., *Doliosarpus amazonicus* subsp. *duckeanus* to *D. duckeanus*).

Keywords: Flora of Colombia, Amazon forests, Vaupés, Taraira, Dilleniaceae, *Doliosarpus*, Colombia

Resumen. Se describe *Doliosarpus daironii*, una especie endémica de los bosques de la Amazonía colombiana, incrementando en 25 el número de especies para este país. Esta nueva especie posee cierta similitud con *D. amazonicus*, *D. duckeanus*, y *D. guianensis*. No obstante, *D. daironii* está más relacionada con *D. guianensis*, sin embargo difiere en la pubescencia de las ramas, ramitas, hojas, ráquis de las inflorescencias, bractéolas, sépalos, forma de las hojas y en el tamaño de los pecíolos e inflorescencias. Se incluye una descripción detallada, información acerca de la morfología, comparaciones con las especies similares, una ilustración, comentarios acerca de la etimología, distribución, hábitat e información del estado actual de conservación. Se presenta una clave actualizada de las especies del género *Doliosarpus* para Colombia y se eleva una subespecie descrita de Brasil al rango de especie (i.e., *Doliosarpus amazonicus* subsp. *duckeanus* a *D. duckeanus*).

Palabras clave: Flora de Colombia, Bosques amazónicos, Vaupés, Taraira, Dilleniaceae, *Doliosarpus*, Colombia

The pantropical family Dilleniaceae, with 11 genera and ca. 500 species, is notably diverse in the Neotropics, where more than one fifth of these taxa are found (Fraga and Stehmann, 2010; Aymard and Kelloff, 2016; Aymard, 2020; Aymard and Todzia, 2024), with representatives extending into the tropical Old World and temperate Australia (Horn, 2006, 2009). The infra classification of the family has changed over the last decade from the results of several phylogenetic analyses (Horn, 2009; Fraga, 2012) and morphological data. As a consequence, four subfamilies have been recognized (*Delimoideae* Burnett, *Dillenioideae* Burnett, *Doliosarpoideae* J.W. Horn, and *Hibbertioideae* J.W. Horn, see Horn, 2006, 2009), and the genus *Neodillenia* Aymard was phylogenetically recognized by Fraga (2012). These works also confirm that *Doliosarpus* Rol. is a monophyletic genus (Horn, 2009; Fraga, 2012).

Doliosarpoideae includes six genera endemic to the Neotropical region (Horn, 2006, 2009; Fraga, 2012): *Curatella* Loefl., *Davilla* Vand., *Neodillenia* Aymard,

Pinzona Mart & Zucc., and *Doliosarpus* Rol., which is the most diverse. The latter genus includes about 50 species distributed throughout southern Mexico, Central America, the Antilles, the Guianas, Venezuela, Colombia, Ecuador, Peru, Bolivia, Brazil, and Paraguay (Fraga and Paula-Souza, 2015; Aymard and Kelloff, 2016; Aymard, 2020; Monzoli et al., 2022).

Within the family, this genus is defined by its lianas (rarely erect or scandent shrubs), its racemose, fasciculate, or glomerate ramiflorous inflorescences, a unicarpellate, 1-celled ovary, its fruit, a berry that sometimes opens irregularly, and seeds that are completely covered by a white aril (Kubitzki, 1971). *Doliosarpus* comprises two well-delimited sections, based on the monograph by Kubitzki (1971). Most of the species belong to *Doliosarpus* sect. *Calinea* (Aubl.) Eichler and are characterized by having leaves with subparallel (rarely reticulate) tertiary nerves, erect, flexuose filaments with introrse anthers at anthesis, and a glabrous or pilose ovary. In contrast, the species of *Doliosarpus* sect. *Doliosarpus* Kubitzki have

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leaves with reticulate tertiary nerves, reflexed filaments with extrorse anthers at anthesis, and a pilose (rarely glabrous) ovary. Although the stamen character (filaments at anthesis) represents a reliable morphological feature when assigning specimens of *Doliocarpus* to these two sections, most specimens do not have flowers at anthesis, or have flowers lacking petals, many having instead young fruit with persistent sepals and stamens. Leaf venation, therefore, is perhaps the most valuable character to define the two sections of this genus (Aymard, 2017, 2020).

MATERIALS AND METHODS

We consulted the original protologues of other species of the genus included in the latest monograph of *Doliocarpus* (Kubitzki, 1971) and those of several new species described from Colombia after the latter monograph (Aymard, 1991, 1993, 1997, 2007, 2017). The available Dilleniaceae treatments were also reviewed: “Sinopsis y adiciones a las Dilleniaceae del Perú” (Aymard and Miller, 1994), Flora of Venezuela Guayana (Aymard, 1998), Flora of the Guianas (Aymard and Kelloff, 2016), and Flora of Ecuador (Aymard, 2020). Dilleniaceae checklists were also reviewed: “Nuevo Catálogo de la Flora de Venezuela” (Aymard, 2008), “Lista de Especies da Flora do Brasil” (Fraga and Paula-Souza, 2015), and “Catálogo de Plantas y Líquenes de Colombia” (Aymard, 2016).

We analyzed specimens either from online botanical collections or in person: B, COAH, COL, F, G, GH, K, M, NY, P, PORT, US, and W (herbarium acronyms after Thiers, 2023). Additionally, the type specimens of species

This contribution increases the number of species of *Doliocarpus* known from Colombia to twenty-five, six of which are endemic (*D. chocoensis* Aymard, *D. daironii* Aymard, *D. lopez-palacii* Aymard, *D. putumayensis* Aymard, *D. schultesianus* Aymard, and *D. trianaanus* Aymard). An updated key for all species of *Doliocarpus* from Colombia is provided. The new species was identified by Dairon Cárdenas-López† based on a misidentified collection stored in COAH.

of *Doliocarpus* were examined in person or using online images from JSTOR Global Plants ([https:// plants.jstor.org/](https://plants.jstor.org/)). The latter is a useful tool because it focuses on type collections and allowed us to be confident that the new species had contrasting features from the known species of *Doliocarpus*.

A 1:1 solution of glycerin and physiological solution was used over three days to hydrate and soften the dried flowers.

The specific terminology for vegetative characters, vestiture description, inflorescences, and flower and fruit morphology used in the description and taxonomic key follows Kubitzki (1971), Font-Quer (2001), and Harris and Harris (2006).

Conservation status [extent of occurrence (EOO) and area of occupancy (AOO)] proposed in IUCN categories and criteria (IUCN 2022) were not calculated because this new species is known only from the type specimen (see discussion in conservation status).

TAXONOMY

Doliocarpus daironii Aymard & Monzoli, *sp. nov.*

TYPE: COLOMBIA. Vaupés: Municipio de Taraira, Estación Biológica Caparú (Mosiro-Itajura), 3 km North of Lago Taraira, bosque sobre terraza, 1°00'S; 69°49'W, 200 m, 23 March 1990, Sara Defler 1150 (Holotype: COAH [017039]). Fig. 1.

Doliocarpus daironii has certain similarities to *D. amazonicus* Sleumer, *D. duckeanus* (Kubitzki) Aymard & Monzoli, and *D. guianensis* (Aubl.) Gilg. This new species is most similar to the latter, but differs in its branches and branchlets with adpressed yellow pubescence; oblong or oblong-elliptic leaves with a rounded base, a rounded to emarginate apex, blades that are shiny and lead-colored on the adaxial surface, dull brown on the abaxial surface, glabrous, except along the midrib and the secondary nerves, where they are covered with erect and adpressed golden-yellow trichomes, and a slightly crenate margin mostly in the upper half; petiole 1–2 cm long with adpressed yellow pubescence; inflorescence 0.5–0.6 cm long, 1- to 3-flowered, rachis with dense, white adpressed pubescence, ovate bracteoles, sepals with sparse, adpressed pubescence abaxially, sericeous adaxially, more densely on the midrib.

Liana, branches and branchlets sulcate, adpressed yellow pubescent, glabrescent when mature, bark flaking off when mature. *Leaves* coriaceous, oblong or oblong-elliptic, 9–14 × 5–8 cm, base rounded, apex rounded to emarginate, blade glabrous, lead-colored and shiny on the adaxial surface, dull

and brown on the abaxial surface, glabrous on the abaxial surface, except along the sulcate midrib and the secondary nerves, that are covered with erect and adpressed golden-yellow trichomes, margin slightly revolute, entire on the lower half, crenate mostly on the upper half, lateral nerves 7–11, linking ca. 1 mm close to the margin, elevated on the abaxial surface, tertiary venation subparallel, evident on both surfaces; petiole stout at the base, 1–2 cm long, 1–2 mm wide, subwinged on the upper half, canaliculate, adpressed yellow pubescent. *Inflorescence* ramiflorous, racemose, 5–6 mm long, 1- to 3-flowered, rachis with dense, white adpressed pubescence, bracteoles 1, ovate, 1–2 × 1.0–1.5 mm, situated at the base of the pedicel, pubescence like the inflorescence rachis on both surfaces. *Flowers* pedicelate, pedicel ca. 1 mm long, pubescence like the inflorescence rachis; sepals 5, subequal, wide-ovate, external 2, ca. 2.5 × ca. 2.0 mm, internal 3, ca. 3.5 × ca. 3.0 mm, sparse, adpressed pubescence externally, sericeous internally, more dense on the midrib; petals not seen; stamens 55–60, filaments cylindrical 3.0–3.3 mm long, glabrous, anthers oblong, ca. 0.5 mm long, glabrous; ovary globose, sulcate, ca. 1.5 × 1.5 mm, glabrous, pistil ca. 1 mm long, glabrous, stigma flattened to rotate, ca. 1 mm diam., glabrous. *Fruit* not seen.

Phenology: Known only from mature flower in March.

Eponymy: This species is named in honor of Dairon Cárdenas-López (1957–2022), a prominent Colombian botanist from Instituto Amazónico de Investigaciones

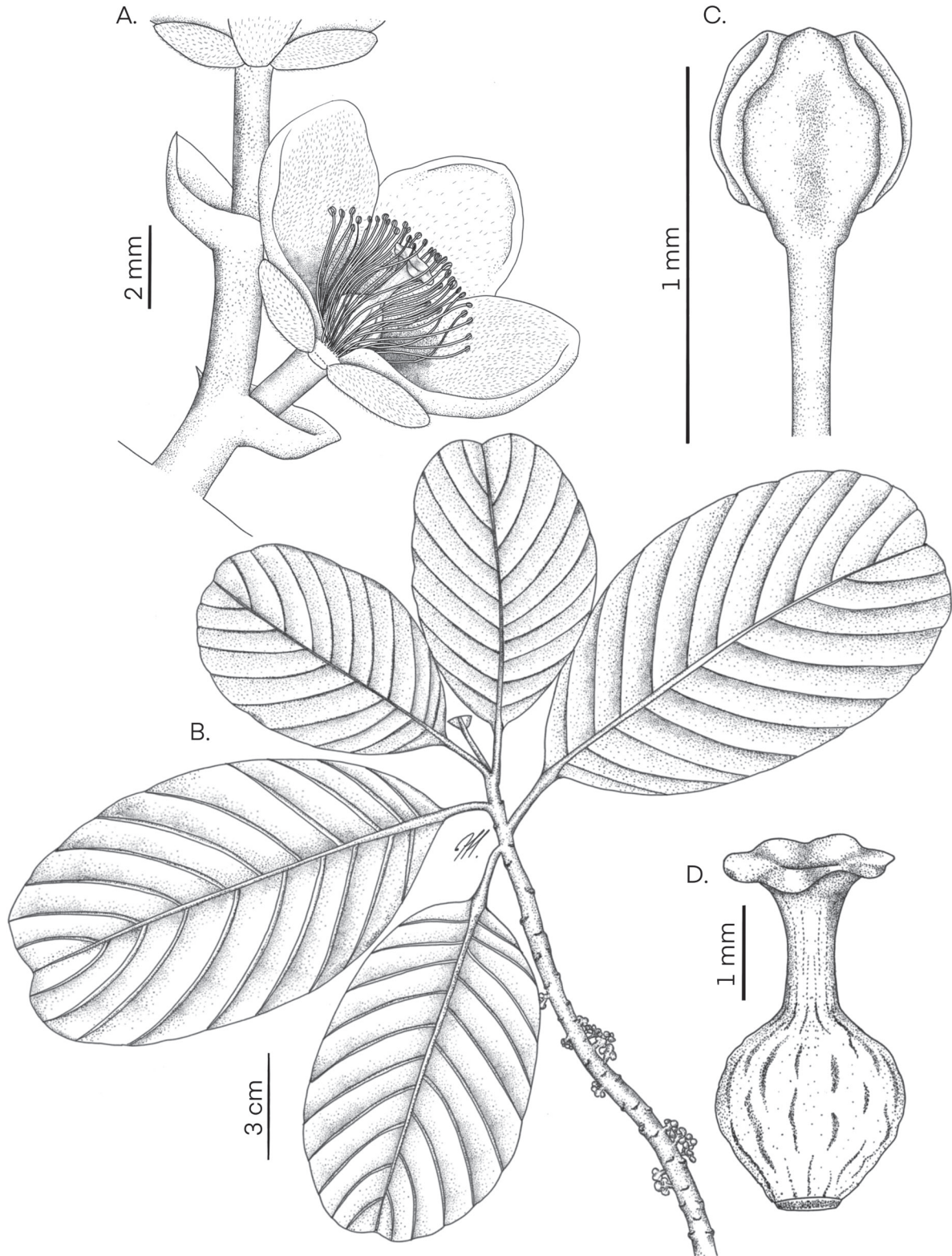


FIGURE 1. FIGURE 1. *Doliocarpus daironii* Aymard & Monzoli. **A**, Lateral view of a portion of inflorescence showing the flower and bracteole; **B**, Habit showing the branch and leaves; **C**, Frontal view of the anther showing the broadened connective; **D**, Carpel. Drawn by M. Sánchez based on the holotype.

Científicas (SINCHI). He was an expert in the Amazonian flora and worked tirelessly for more than three decades in the herbarium COAH in order to better understand the flora and vegetation of the Amazon basin. His great spirit of collaboration and his work ethic inspired generations of young Colombian botanists and numerous national and foreign colleagues to continue researching in the fascinating world of tropical vegetation. He holds the distinction of having collected more specimens (> 54,000) than any other Colombian plant collector, to date.

Distribution and ecology: This species is known only from the type locality near Lake Taraira, a region on terraces that originated in the Pleistocene. The area is an ancient meander of the lower Apaporis River basin, located in the southeast of Vaupés department (Defler, 1999), harbors a diverse flora (Clavijo, 2006; Clavijo et al., 2009; Cárdenas-López et al., 2010), with several endemic taxa of the Amazonian Colombia such as *Duguetia vaupesana* Westra & Maas (Annonaceae) and *Costus fissicalyx* N.P. Salinas, Clavijo & Betancur (Costaceae). The Caparú Biological Station, also known as Mosiro-Itajura, is located in this area, and is where important research on monkey behavior and diets has been done (Defler and Defler, 1996; Clavijo, 2006; Defler, 2010; González et al., 2016).

Doliocarpus daironii was collected in “bosques de terraza,” which is a type of non-flooded wet forest found in the north/northwestern portion of the Amazonia region (i.e., Rio Negro basin; for a review see Arellano-Peña et al., 2023). In general, these communities have trees 30–40 m tall, a dense understory, and are dominated by *Oenocarpus bataua* Mart. (Arecaceae) and *Micrandra spruceana* (Baill.) R.E. Schult. (Euphorbiaceae) (Mantilla-Meluk & Barrios-Rodríguez, 1999; Clavijo et al., 2009). However, this new species probably has a wider distribution in the moist forests located in this portion of the northwestern Amazon region, an area not sufficiently explored botanically.

Conservation status: This new species is so far only known from the type locality, and, under IUCN (2022) guidelines, a taxon with one or two localities would indicate that its conservation status should be categorized as deficient data (DD). Additional information and research may eventually reveal that this species should be placed under the threatened classification (IUCN, 2022). Nevertheless, it should be regarded as Endangered due the gold mining exploitation in the last four decades in the ecosystems located in the lower Apaporis and Tairara river basins (for a review see Rubiano Galvis, 2014). The good news is that the type locality is part of Parque N. N. Yaigojé Apaporis, a region that is protected by the Colombian National Park Service (Parques Nacionales Naturales de Colombia).

Because its leaves have subparallel tertiary venation without verrucosities, *Doliocarpus daironii* belongs in section *Calinea* (Kubitzki, 1971). By its racemose inflorescence and glabrous carpel, this new species is morphologically related to three other taxa in section *Calinea*: *D. amazonicus* Sleumer, *D. duckeanus* (Kubitzki) Aymard & Monzoli, and *D. guianensis*. Nonetheless, *D. daironii* differs from these three species in the characters presented in Table 1 and in the *Doliocarpus* key of Colombian species below.

Doliocarpus duckeanus (Kubitzki) Aymard & Monzoli, comb. et stat. nov. Fig. 2.

Basionym: *Doliocarpus amazonicus* Sleumer subsp. *duckeanus* Kubitzki, Mitt. Bot. Staatssamml. München 9: 38–39. 1971. TYPE: BRAZIL. Amazonas: Manaus, loco estrada do Aleixo, 25 May 1937, W. A. Ducke 501 (holotype: F [902226], isotypes: A [53239], K [220358], MG [195579], MO [279575], NY [428736], R [75375], RB [542269; 538306], US [110013], S [08-21383]), SP [598].

Taxonomic history: *Doliocarpus amazonicus* subsp. *duckeanus* was described as a new subspecies in a revision of *Doliocarpus* (Kubitzki 1971). However, the examination of the original protologues, the type specimens, and numerous additional material in person and of several online botany collections (i.e., Specieslink.net/search [https://specieslink.net/search/index]; JSTOR Global Plants [https://plants.jstor.org/]; GBIF [https://www.gbif.org/species/search]) indicates that it should be treated as a separate species that can be distinguished from *D. amazonicus* by the characters discussed in Table 1 and in the following key to the species of *Doliocarpus*.

Additional specimens examined: BRAZIL. **Amapá:** Macapá. Margem do rio Dois Irmãos, a 12 km de Cupixi, proximo a rodovia Perimetral Norte, W. A. Ducke 327 (NY). **Amazonas:** Presidente Figueiredo, Estrada do Canteiro de obras da Usina Hidrelétrica de Balbina, C. A. Cid F. 7611 (INPA, NY); km 115 de la Rondonia Manaus-Caracará, 01°58'S, 60°02'W, 200 m, O. Huber & L. O. Adão T. 10694 (NY); Km 130 Manaus-Caracará road, G. T. Prance et al. 20355 (INPA, NY); Vicinity of Manaus, Cachoeira Baixa Tarumã, G. T. Prance et al. 11615, 11616 (INPA, M, NY, US); Vicinity of Manaus, Cachoeira Alta Tarumã, W. A. Rodrigues & J. Chagas 8803 (INPA, M); Vicinity of Manaus, Parque 10 de Nov., J. Chagas 3832 (INPA, M); 3 km ao Sul da parte central da Serra Aracá; 08 km à Leste do rio Jauri, W. A. Rodrigues IL4-1 (INPA, NY); Manaus-Caracará Highway, forest at km 130, W. C. Steward et al. 20355 (NY); Km 45, Manaus, -2.73644 S, -59.817968 W, W. A. Rodrigues 2358 (INPA); Manaus, Comunidade do Novo Amanhecer, Campina, -2.856294 S, -60.232914 W, J. V. L. Monzoli & J. A. Vieira 553, 555, 557 (SJRP); Manaus-Itacoatiara, km 26, Reserva Florestal Adolfo Ducke, -2.88333333 S, -59.96666667 W, C. A. Sothers 901 (INPA, US); Rio Cuieiras, -2.48 S, -60.28 W, W. A. Rodrigues 1635 (INPA); Manaus, margem do igarapé da Cachoeira do Tarumã, -3.10193991661072 S, 60.0250015258789 W, F. N. Chagas 21805 (IAN); Rio Uaupés São Gabriel da Cachoeira, 0.09672 N, -67.33163 W, F. A. Carvalho 1497 (INPA); Uatumã, São Sebastião do Uatumã, -2.19194444 S, -59.21833333 W, L. O. Demarchi 1260 (INPA); Presidente Figueiredo, Igarapé das Lajes, -1.98889 N, -60.0275 W, M. H. Terra-Araujo 482 (INPA); Presidente Figueiredo, BR 174, km 120, Fazenda Agroindustrial Chibata, -1.939596 S, -60.03 W, C. A. C. Ferreira 11013 (INPA); Along Manaus-Caracará Road (BR-174), km 115, campina adjacent to Igarapé Lajes, J. L. Zarucchi et al. 2573 (US). **Pará:** Santana do Araguaia, 100 km S of Redenção on road to Barreiras dos Campos, between Rio Inajazinho and Rio Inajá, 08°45'S; 50°25'W, 210 m, T. Plowman et al. 8868 (GH, US).

TABLE 1. Comparison of diagnostic morphological characters of *Doliocarpus daironii* Aymard & Monzoli and closely related species.

CHARACTER	<i>D. AMAZONICUS</i>	<i>D. DAIRONII</i>	<i>D. DUCKEANUS</i>	<i>D. GUIANENSIS</i>
Branches and branchlets	adpressed white pilose, glabrescent when mature	adpressed yellow pubescent	densely ferrugineous-tomentose	laxly white pilose to glabrescent when mature
Leaves	obovate-oblong, base acute, apex wide rotundate, or acute (short acuminate), blades shiny and glabrous (pilosule along the midrib and secondary veins) on the upper surface, adpressed pilose at the lower surface, margins serrate to crenate, mostly in the upper half	oblong or oblong-elliptic, base rounded, apex rounded to emarginate, blades shiny on the upper surface, glabrous on both sides, except along the midrib and the secondary nerves on the lower surface, where they are covered by erect and adpressed golden-yellow trichomes, margins slightly crenate mostly in the upper half	oblanceolate-elliptic, base, acute, apex acute to rounded, blades dull and glabrous (shorty ferrugineous-tomentose along the midrib and secondary veins) on the upper surface, densely shorty ferrugineous-tomentose on the lower surface, more evident along the midrib and secondary nerves, margins crenate-dentate mostly in the upper half	obovate-oblong, base cuneate, apex rounded, obtuse-apiculate, the blades dull on the upper surface, completely glabrous on both sides, margins slightly sinuate mostly in the upper half
Petiole	ca. 0.8–9 cm long, shortly white pubescent to glabrescent when mature	1–2 cm long, adpressed yellow pubescent	1–1.5 cm long, shorty ferrugineous-tomentose	0.5–1 cm long, laxe white pilose
Inflorescence	0.5–1 cm long, 4–8-flowered, rachis yellow pubescent	0.5–0.6 cm long, 1–3-flowered, rachis white adpressed pubescent	0–0.4 cm long; 10–25-flowered, rachis ferrugineous-tomentose	1.5–4.5 cm long, 2–4-flowered, rachis laxe pilose
Sepals	obovate or elliptic, 2–4 mm long, puberulous externally, glabrous internally	wide-ovate, ca. 2.5 mm long, sparsely adpressed pubescent externally, sericeous internally	wide-ovate or obovate, ca. 2 mm long, shorty ferrugineous-tomentose externally, glabrous internally	obovate-oblong, 3–5 mm long, pilosule externally, glabrous internally
Stamens	ca. 35	55–60	ca. 35	ca. 60

AMENDED KEY TO THE SPECIES OF *DOLIOCARPUS* OF COLOMBIA

Modified from Aymard (2017); species indicated with an asterisk (*) are endemic to Colombia

- 1a. Leaves with reticulate tertiary venation with verrucosities on the abaxial surface. 2
 1b. Leaves with subparallel tertiary venation without verrucosities on the abaxial surface. 4
 2a. Lateral nerves terminating at the margin; sepals glabrous externally; fruit covered by trichomes 3–5 mm long
 *D. olivaceus* (Antioquia, Chocó, San Andrés y Providencia)
 2b. Lateral nerves arched and joined close to the margin; sepals adpressed pilose externally; fruit covered with trichomes 0.5–1.0 mm long 3
 3a. Branches terete; leaves shiny on the adaxial surface, glabrous on the abaxial surface; margins entire to subsinuate
 *D. nitidus* (Antioquia, Chocó, Cundinamarca, Huila, Tolima, Santander)
 3b. Branches angulate; leaves dull on the adaxial surface, adpressed pubescent on the abaxial surface; margins sinuate to dentate mostly in the
 upper half. *D. major* (Amazonas, Antioquia, Caquetá, Chocó, Guaviare)
 4a. Erect or scandent shrubs 5
 4b. Woody lianas or vines 8
 5a. Petioles glabrous; sepals appressed pubescent or lax pilose on the abaxial surface. 6
 5b. Petioles tomentose or appressed pilose; sepals glabrous to sparsely pilose or sericeous on the abaxial surface 7
 6a. Leaves coriaceous, not conduplicate (in herbarium specimens), base attenuate, apex obtuse, rotundate or short acuminate, petiole stout,
 3–5 mm wide; inflorescence not longer than 4 mm, pedicels 0–1 mm long. *D. leiophyllus* (Guianía, Vichada)
 6b. Leaves rigid-coriaceous, always conduplicate, base acute, apex acuminate; petiole slender, ca. 1.5 mm wide; inflorescence 5–10 mm long,
 pedicels 2–4 mm long *D. spraguei* (Vichada)
 7a. Petioles not winged, 5–8 mm long; blades obovate-elliptic, 5–7 cm long, shiny and strongly reticulate on the adaxial surface; lateral nerves
 5–7, pilose on the adaxial surface; sepals sericeous on the abaxial surface; fruit glabrous *D. paucinervis* (Guianía)
 7b. Petioles subwinged, 10–20 mm long; blades obovate, lanceolate-obovate, 7–20 cm long; dull and venation evident or inconspicuous on the
 adaxial surface; lateral nerves 9–14(16), glabrous on the adaxial surface; sepals glabrous to sparsely pilose on the abaxial surface, fruit
 sparsely pilose *D. savannarum* (Caquetá, Guianía)

AMENDED KEY TO THE SPECIES OF *DOLIOCARPUS* OF COLOMBIA CONT.

Modified from Aymard (2017); species indicated with an asterisk (*) are endemic to Colombia

- 8a. Inflorescence sessile or 1–10 mm long 9
- 8b. Inflorescence longer than 12 mm 23
- 9a. Inflorescence racemose (peduncle with 2 to 6 flowers) 10
- 9b. Inflorescence (sub)sessile, fasciculate, or glomerulate, not racemose (peduncle with a single flower) 15
- 10a. Leaves conduplicate, rigid-coriaceous; margins in the upper half of the leaf blade entire *D. spraguei* (Vichada)
- 10b. Leaves not conduplicate, subcoriaceous or coriaceous; margins dentate or sinuate mostly in the upper half 11
- 11a. Leaves obovate-oblong, oblong, oblong-elliptic or oblanceolate-elliptic 12
- 11b. Leaves obovate, lanceolate to elliptic 14
- 12a. Leaves 9–14 cm long; inflorescence 1- to 3-flowered; sepals with sparse, adpressed pubescence abaxially, sericeous adaxially; stamens 55–60 *D. daironii** (Vaupés)
- 12b. Leaves 16–24 cm long; inflorescence 4- to 25-flowered; sepals puberulent to glabrescent or short ferruginous tomentose abaxially, glabrous adaxially; stamens ca. 35 13
- 13a. Branches and branchlets adpressed white pilose, glabrescent when mature; leaves obovate-oblong, blades shiny and glabrous (pilosule along the midrib and secondary veins) on the adaxial surface, adpressed pilose on the abaxial surface; inflorescence 0.5–1.0 cm long, 4- to 8-flowered, rachis yellow pubescent *D. amazonicus* (Amazonas)
- 13b. Branches and branchlets dense ferruginous tomentose; leaves oblanceolate-elliptic, blades dull and glabrous (short ferruginous tomentose along the midrib and secondary veins) on the adaxial surface, dense, short ferruginous tomentose on the abaxial surface, more evident along the midrib and secondary nerves; inflorescence 0.0–0.4 cm long; 10- to 25-flowered, rachis ferruginous tomentose *D. duckeanus* (probably, Amazonas, Caquetá, Guainía, Vaupés)
- 14a. Leaves lanceolate to elliptic, 6–15 cm long, 6–9 secondary nerves, base attenuate; pedicels sparsely pilose, sepals ovate-elliptic, fruit 5–6 mm in diameter, glabrous *D. brevipedicellatus* (Antioquia, Bolívar, Chocó, Córdoba, Guainía, Guaviare, Meta, Vaupés, Vichada)
- 14b. Leaves obovate or lanceolate, 15–29 cm long, 13–14 secondary nerves, base cuneate; pedicels pubescent, sepals wide-ovate, fruit ca. 12 mm in diameter, dense, adpressed pubescent *D. putumayensis** (Amazonas)
- 15a. Leaves 2–4 cm wide, petioles 4–7 mm long; sepals oblong; fruit 4–6 mm in diameter *D. chocoensis** (Chocó)
- 15b. Leaves 4–15 cm wide, petioles 0.7–5.0 cm long; sepals obovate, ovate, elliptic or obovate-elliptic; fruit 5–20 mm in diameter 16
- 16a. Leaf blades with tertiary venation prominently areolate on the abaxial surface *D. areolatus* (Guainía)
- 16b. Leaf blades with tertiary venation without areoles 17
- 17a. Leaves 14–35 cm long 18
- 17b. Leaves 5–12 cm long 20
- 18a. Branches, branchlets, petioles and blades covered with yellow trichomes; leaves opposite, petioles 5–6 mm long, peduncles 0.5–1.0 mm long *D. pruskii* (Antioquia, Guaviare)
- 18b. Branches, branchlets, petioles and blades glabrescent, or if pubescent, not covered with yellow trichomes; leaves alternate, petioles 1.5–5.0 cm long, peduncles 0.5–7.0 mm long 19
- 19a. Leaves black punctate on the abaxial surface; petioles 3–5 cm long; peduncles 4–7 mm long *D. lopez-palacii** (Antioquia)
- 19b. Leaves without black dots on the abaxial surface; petioles 1.5–3.0 cm long; peduncles 0.5–1.0 mm long *D. foreroi* (Chocó, Valle)
- 20a. Leaves pilose, tomentulose or pubescent on adaxial surface 21
- 20b. Leaves glabrous on adaxial surface 22
- 21a. Leaves elliptic, dense pubescent on the abaxial surface; peduncles ca. 2 mm long, sepals ciliate at the margins, fruit completely pubescent (covered with yellow, stinging trichomes) *D. schultesianus** (Vaupés)
- 21b. Leaves obovate or obovate-elliptic, tomentulose on the abaxial surface, peduncles 2–7 mm long, sepals not ciliate at the margins, fruit sparsely adpressed pilose (white, non-stinging trichomes) *D. macrocarpus* (Amazonas, Santander, Vaupés)
- 22a. Leaves lanceolate or lanceolate-elliptic, coriaceous, margins subrevolute; petioles 0.5–2.0 mm wide; sepals elliptic, 2.0–4.5 mm long, glabrous or sparsely pilose on the abaxial surface *D. savannarum* (Guainía)
- 22b. Leaves elliptic or elliptic-oblong, rigid-coriaceous, margins strongly revolute; petioles 3–4 mm wide; sepals ovate-elliptic, 5.5–6.0 mm long, adpressed pilose on the abaxial surface *D. liesneri* (Guainía)
- 23a. Inflorescence racemose (peduncle with 2 to 10 flowers) 24
- 23b. Inflorescence fasciculate not racemose (peduncle with a single flower) 25
- 24a. Leaves coriaceous, oblanceolate-obovate or lanceolate, margins entire or subsinuate; sepals elliptic *D. novogranatensis* (Amazonas, Chocó, Meta)
- 24b. Leaves subcoriaceous, obovate-lanceolate, margins dentate; sepals obovate or obovate-oblong *D. multiflorus* (Amazonas, Antioquia, Caquetá, Chocó, Valle)
- 25a. Sepals lax pubescent to glabrescent on the abaxial surface; fruit glabrous 26
- 25b. Sepals on the abaxial surface; fruit densely pubescent 31
- 26a. Leaves 14–30 × 10–20 cm 27
- 26b. Leaves 6–12 × 5–8 cm 28
- 27a. Stems, petioles, and leaf blades glabrous or with sparse, non-ferruginous pubescence *D. dentatus* subsp. *latifolius* (Guainía, Vaupés)
- 27b. Stems, petioles, and leaf blades with spreading, ferruginous pubescence *D. dentatus* subsp. *ferrugineus* (Chocó)
- 28a. Leaves chartaceous or subcoriaceous, serrate mostly in the upper half of blades 29
- 28b. Leaves coriaceous to rigid-coriaceous, crenate or sinuate mostly in the upper half of blades 30
- 29a. Leaves glabrous or with sparse, non-ferruginous pubescence *D. dentatus* subsp. *dentatus* (Amazonas, Arauca, Bolívar, Boyacá, Caquetá, Chocó, César, Magdalena, Meta, Vaupés)
- 29b. Leaves densely ferruginous pubescent *D. dentatus* subsp. *esmeraldae* (Caquetá)

AMENDED KEY TO THE SPECIES OF *DOLILOCARPUS* OF COLOMBIA CONT.

Modified from Aymard (2017); species indicated with an asterisk (*) are endemic to Colombia

- 30a. Leaves crenate, ovate-elliptic, apex rounded or short acuminate. *D. dentatus* subsp. *undulatus* (Caquetá, Guianá, Vaupés)
 30b. Leaves sinuate, obovate, or elliptic, apex strongly cuspidate. *D. dentatus* subsp. *obovatus* (Amazonas)
 31a. Leaf margin entire or subsinuate; petioles 3.0–4.5 cm long; sepals pubescent on the adaxial surface. *D. robustus* (Valle)
 31b. Leaf margin dentate or sinuate-crenate; petioles 1.0–2.5 cm long; sepals glabrous on the adaxial surface. 32
 32a. Leaves obovate, obovate-elliptic, or rhombic-ovate; margins sinuate-crenate; peduncles adpressed pubescent; fruit covered with short and long trichomes. *D. hispidobaccatus* (Amazonas, Caquetá)
 32b. Leaves elliptic or elliptic-obovate; margins dentate; peduncles hispid; fruit covered with a single trichomes size. 33
 33a. Leaves wide elliptic or elliptic-obovate, 10–21 × 4–10 cm, base cuneate, margins in the upper half of the leaf blade dentate, petiole ca. 15 mm long; peduncles with 2 coriaceous bracteoles; sepals broad ovate to suborbicular, dense, yellow hispid pubescent abaxially; fruit 9–10 mm diam., covered with yellow trichomes. *D. hispidus* (Caquetá, Valle)
 33b. Leaves elliptic, 5–13 × 3–6 cm, base attenuate, margins dentate along the blade, petiole 5–10 mm long; peduncles with 3 papyraceous bracteoles; sepals ovate, adpressed sericeous pubescent abaxially; fruit ca. 12 mm diam., covered with white trichomes. *D. trianaus** (Antioquia)

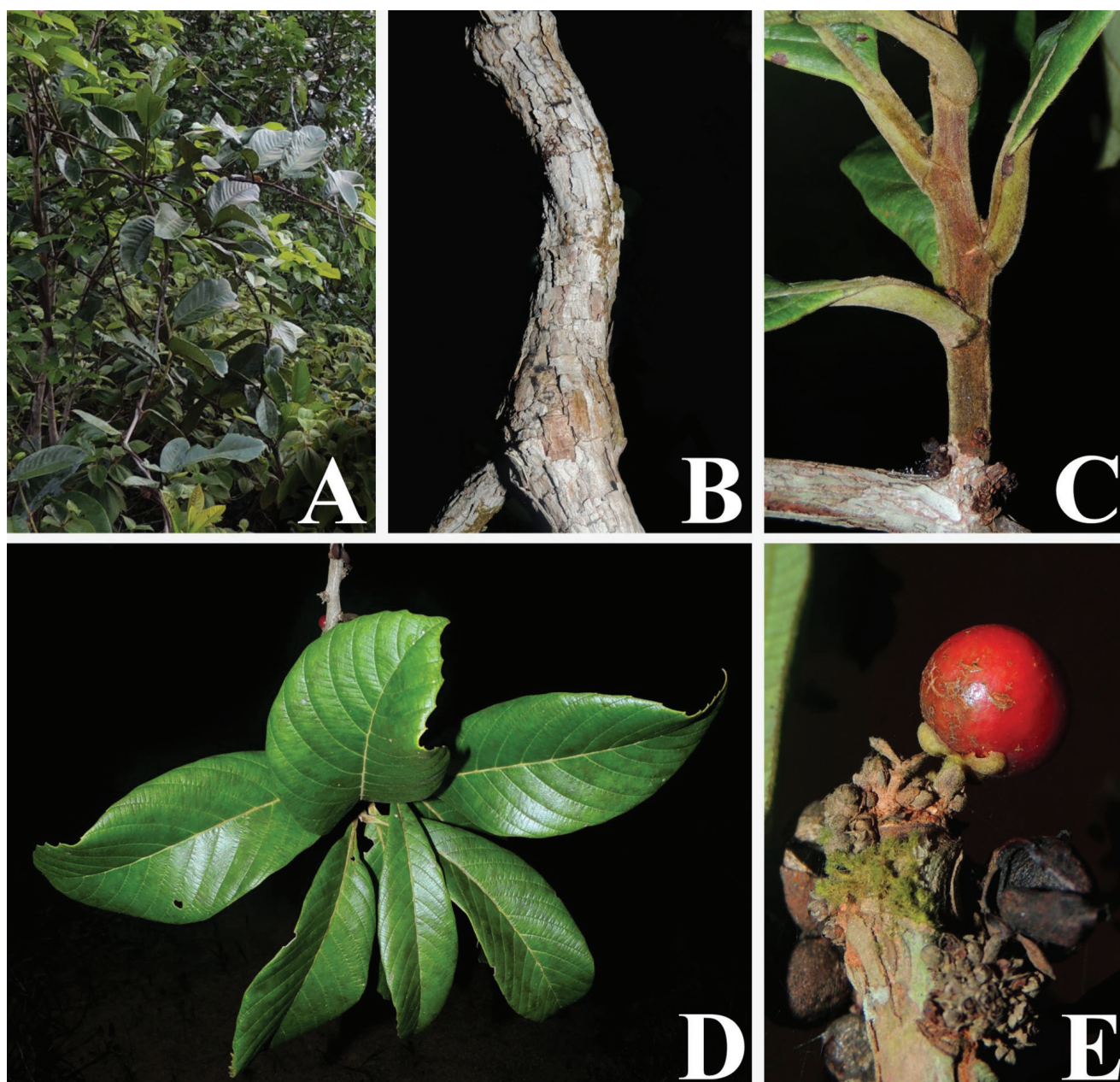


FIGURE 2. *Doliocarpus duckeanus* (Kubitzki) Aymard & Monzoli. **A**, Overall view of the species in nature, municipality of Manaus, state of Amazonas, Brazil. **B**, Mature stem. **C**, Young branch showing the ferruginous tomentose indument. **D**, Mature leaves, adaxial view. **E**, Fruit. Photographs by João Monzoli based on Monzoli & Vieira 553.

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