

A revision of neotropical *Diospyros* (Ebenaceae): part 16

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Abstract

In the course of a revision of the New World Ebenaceae for "Flora Neotropica" and some regional floras, specimens from ca. 100 herbaria have been studied. *Diospyros cayennensis* A.DC. (synonyms: *D. ierensis* BRITTON and *D. serrana* SOTHERS) from eastern South America as well as the closely related Bahian endemic *D. scottmorii* B.WALLN. from Brazil are presented here. Plates showing their morphology, a distribution map, vernacular names, information on habitat, phenology, and biology, and lists of specimens are included.

Key words: Ebenaceae, *Diospyros cayennensis*, *D. ierensis*, *D. scottmorii*, *D. serrana*, revision, taxonomy, distribution map, Flora of South America.

Zusammenfassung

Im Rahmen einer Revision der neuweltlichen Ebenaceae für "Flora Neotropica" und einige Regionalfloren konnten Herbarbelege aus ca. 100 Herbarien studiert werden. *Diospyros cayennensis* A.DC. (Synonyme: *D. ierensis* BRITTON, *D. serrana* SOTHERS) aus dem östlichen Südamerika, sowie der damit nahe verwandte Endemit *D. scottmorii* B.WALLN. aus Bahia (Brasilien) werden hier präsentiert. Abbildungen der morphologischen Merkmale, eine Verbreitungskarte, Volksnamen, Angaben zu den Habitaten, zur Phänologie und der Biologie, sowie Listen der gesehenen Herbarbelege werden vorgelegt.

Introduction

In the Americas, Ebenaceae are represented by the genera *Diospyros* L., with about 100–150 species, and *Lissocarpa* BENTH. in BENTH. & HOOK.f., with eight species. In the course of the ongoing revision of Ebenaceae for "Flora Neotropica", the following contributions have already been published: WALLNÖFER 1999, 2000, 2001a, 2001b, 2003, 2004a, 2004b, 2004c, 2005, 2007–2022, 2008a, 2008b, 2010a, 2010b, 2010c, 2012, 2015a, 2015b, WALLNÖFER & MORI 2002, ESTRADA & WALLNÖFER 2007, and WALLNÖFER & CHÁVEZ 2014 (see also DUANGJAI et al. 2006, 2009).

For this ongoing revision, the species are published in installments with a special focus on those occurring in eastern Brazil. Amazonian species will be treated in subsequent publications. Due to the size and complexity of the genus *Diospyros*, any discussion on interspecific relationships, infrageneric arrangement, and biogeography in the Neotropics would be premature before completion of the revision.

Terminology. The terminology used in the descriptions is in accordance with STEARN (1992). The term "patent" means spreading at an angle of 90° (this definition is also given by BEENTJE et al. 2003, and BEENTJE & WILLIAMSON 2010). As in parts 1–13 of the current revision, the term "spreading" is used for all intermediate positions of the hairs

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(trichomes) between appressed and patent. Where necessary, any further specifications are added, e. g. "slightly spreading". An indumentum is called "medium dense" when the surface (epidermis) of the organ in question is still visible between the crowded hairs; it is defined as "dense" when the surface is not visible.

Note: Data from herbarium labels are cited here in a standardized way. Corrections and additions to these data, as well as geographic coordinates determined during this revision, are given in square brackets. Acronyms of herbaria are used according to THIERS (2022). – Abbreviations: defl = deflorate; fl = flowering; flbuds = with flower buds; fr = fruiting; st = sterile; yfr = with young fruits; carp = fruit in the carpological collection; n.s. = not seen; s.n. = without number; s.d. = without date; s.coll. = without collector; s.lat. = sensu lato; s.str. = sensu stricto; 2× = 2 sheets.

***Diospyros cayennensis* A.DC.**, Prodr. 8: 224 (1844); – [Fig 1–3].

The protologue indicates: "prope Cayennam et culta Jamaicae (Bert.!)".

Typus. "Cayenne ou Guyane Françoise, Muséum de Paris 1821", [ca. 4°56' N, 52°20' W], s.d. (male flower buds), [J. Martin s.n.], [lectotype designated by WALLNÖFER (2001b): G-DC (G00142182; Field Museum negative no. 7508: photos in F, MICH, MO, NY, US; respectively IDC 800. 1466: I. 4); possible isolectotypes: BM, F (fragm. ex P), FHO, FI-W n.s. (dig. photo), K, L, MG n.s. (dig. photo), P]; – for further details see WALLNÖFER (2001b).

= *Diospyros ierensis* BRITTON, Bull. Torrey Bot. Club 48 (12): 336–337 (1922).

Typus. Trinidad & Tobago, St. George, forest near the summit of Mount Tucuche [= El Tucuche], [10°44' N, 61°25' W], (fr), 3–5 Apr. 1920, N.L. Britton, T.E. Hazen & W. Mendelson 1243 [holotype: NY, isotypes: GH, MG n.s. (dig. photo), US], "tree 12 m".

= *Diospyros serrana* SOTHERS, Kew Bull. 58 (2): 477 (2003).

Typus: Brasil, Pernambuco, São Vicente Férrer, Mata do Estado, 600 m, 7°35' S, 35°30' W, mata úmida; solo argilo-arenoso; interior da mata do caidor, (fl female), 15 Dec. 1999, E.M.N. Ferraz, Gilson & Manoel 766 [holotype: PEUFR n.s., isotypes: CEPEC n.s. (dig. photo), K 2×, PEUFR 30932 (n.s.) (dig. photo received on 22.9.2008; the specimen bears only the name "*D. tetrandra*")], "árvore ca. 30 m, frequente; exsudato incolor; entrecasca branca na hora do corte, porém após alguns segundos fica totalmente amarela; flores com cálice verde e corola esverdeada; frutos imaturos verdes, com cálice persistente verde"; – vernacular name: laranjinha.

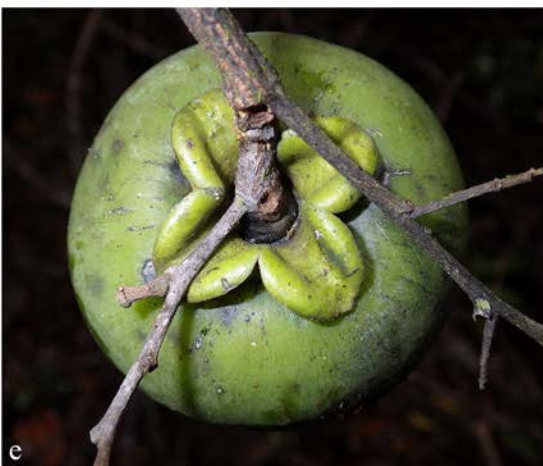
Note: Based on the herbarium material at my disposal, I was unable to recognize any relevant differences between *D. serrana* and *D. cayennensis*.

Tree up to 30 (–40) m tall, dbh up to ca. 50 cm, already flowering when ca. 5 m tall, evergreen; trunk unbuttressed; dead bark ± black, like charcoal, hard, friable, usually with small longitudinal fissures, detaching in irregular oblong pieces; inner bark white, soon yellow or greenish-yellow after exposure to air; wood whitish-yellow, hard; twig apices and very young leaves densely covered with appressed, straight hairs; young twigs terete, medium densely covered with ± straight or slightly bent, ± appressed or ±



Fig. 1: *Diospyros cayennensis*: (a) male cymes (from Forest Dep. Brit. Guiana 4520 [NY]); (b) male flowers (from Marcano 271 [US]); (c) female flowers (from Steyermark & Rabe 96037 [U]); (d) female flowers (from Prévost 3430 [W, flowers in alcohol]); (e) young fruit (from Mori & Boom 15197 [W]); (f) young fruit (from Prévost & Sabatier 3574 [W]); – scale = 1 cm.

spreading hairs of different lengths; older twigs glabrescent; – **leaves**: alternate; petioles 4–10 (–12) mm long, 2 mm thick, flattened or ± canaliculate adaxially, covered with the ± same sort of hairs as that on the twigs, glabrescent when old; leaf lamina (2–) 7–19 (–23) cm long, (1–) 3–6 (–10) cm wide, (1–) 2–3.5 times as long as wide, widest ± at the middle or above the middle, sometimes slightly oblong, firmly chartaceous to coriaceous (thinner on shade-leaves); young leaves usually intense brown when dry [Andel et al. 756 stated: "young leaves turn brown quickly when cut"]; adaxial surface of mature leaves ± lustrous and dark green when alive, glabrous; abaxial surface paler green and dull when alive, with scattered, ± appressed, ± straight hairs when young, glabrescent when mature; leaf apex shortly acuminate or ± acute, less frequently obtuse, rarely rounded; base of the lamina cuneate, rarely ± rounded; leaf margins entire, slightly



revolute when dry; flachnectaria minute, usually many, scattered all over the abaxial leaf surface; midvein on adaxial side sunken, \pm flat or slightly raised distally, soon glabrescent, on abaxial side markedly prominent, scattered to medium densely covered with appressed or slightly spreading, straight or slightly bent hairs of different lengths; secondary veins to ca. 11 per side, slightly raised on both sides; veins of third to fifth order slightly raised on both sides, less frequently \pm scarcely visible on coriaceous leaves from the upper, exposed part of the tree crown; – **inflorescences**: male cymes (1–) 3 (–7)-flowered, borne in the axil of mature leaves; bracteoles up to 3 (–6.5) mm long, 1 (–1.5) mm wide, acute, densely covered with flexuose, \pm spreading hairs abaxially, glabrous (except near the apex) adaxially; stalks (peduncles and pedicels) 3–6 mm long, \pm 1 mm wide, densely covered with brown to ferruginous-brown, spreading hairs; – female cymes 1-flowered, borne in the axil of mature leaves; stalk 7–9 mm long, proximally 2–3 mm, distally 4–5 mm thick (1.5 and 2 mm respectively when dry), densely covered with appressed, \pm straight hairs; bracteoles 3–9 mm long, 1–2.5 mm wide, \pm acute, medium densely to densely covered with \pm appressed hairs abaxially, \pm glabrous adaxially; – flowers: 4 (–5)-merous; – **male flowers** (Fig. 1a–b, 2a, 2c–d): 13–15 mm long at anthesis (pedicels excluded, and with petals flexed outwards); calyx ca. 11 mm long, undivided in the proximal 5 mm, green, pale green, yellow green or yellow when alive, on the outside \pm densely covered with \pm straight, \pm appressed hairs near its base; calyx lobes 5–6 mm long and wide, \pm triangular, with involute margins when dry, on the abaxial side medium densely covered with appressed or slightly spreading, \pm straight or slightly bent hairs of different lengths, on the adaxial side usually densely covered with flexuose, spreading to \pm patent hairs towards the margins and with appressed, \pm straight hairs along the median line of the lobes; sinuses between the calyx lobes \pm strongly expanded outwards; corolla ca. 13 mm long, 8–10 mm wide at anthesis, fleshy; corolla tube 9–12 mm long, 2.5–3.5 mm wide, widest below the middle, with a 0.8–1 mm wide porelike aperture (see Fig. 2a) distally, green, greenish-white, yellow-green or yellow when alive, densely or less frequently only medium densely covered with \pm straight, appressed to slightly spreading hairs; corolla lobes 3–6 mm long, 3–6 mm wide, widest at or below the middle, obtuse or acute, sometimes rounded, pale yellow to deep yellow when alive (flowers said to oxidize rapidly, turning black; compare Fig. 2a), abaxially medium densely to densely covered with short, \pm flexuose hairs along the median line of the lobes and with \pm scattered, tiny hairs elsewhere, sometimes \pm glabrous, adaxially glabrous; stamens 11–14 per flower (in 4-merous flowers: 11 in Marcano 271 from Venezuela, 12 in Forest Dep. Brit. Guiana 4236 and Sandwith 1123 [fide SANDWITH 1939] both from Guyana, 12 in Mori et al. 22298 from French Guiana, 14 in Blanco 260 from Venezuela), differing slightly in size, 3–5 mm long, some of them paired, others single, included in the corolla tube; filaments 1.5–2 mm long, up to 0.8 mm wide and 0.3 mm thick, adnate to the corolla tube at its base, glabrous proximally, \pm densely covered with spreading

- ◀ Fig. 2: *Diospyros cayennensis*: (a) male flowers (from Mori et al. 24985); (b) female flowers (from Prévost 3430); (c–d) male cymes and calyx of a male flower with already shed corolla (see the chapter about biology; both from Morales 21949); (e–f) fruits (from Nusbaumer et al. LN 4624); – photo a: courtesy of Scott A. Mori (†, 1941–2020); b: courtesy of Marie-Françoise Prévost (†, 1941–2013); c–d: courtesy of J. Francisco Morales (TRIN); e–f: courtesy of Luis Nusbaumer (G).

hairs distally on both sides; anthers 1.5–2.5 mm long, ca. 0.3 mm wide, green and then buff colored when alive; connectives covered with straight, appressed hairs abaxially, glabrous adaxially except proximally; distal appendage of connectives 0.5–0.8 mm long, acute; rudiment of the ovary (pistillode) very reduced and densely covered with patent hairs; – **female flowers** (Fig. 1c–d, 2b): at anthesis up to 16 mm long (when corolla lobes erect and with pedicels excluded); calyx 11–14 mm long, 18–25 mm wide, undivided in the proximal 6–7 mm, green when alive, on the outside medium densely to densely covered with straight or ± flexuose, slightly spreading hairs of different lengths near its base; calyx lobes 8–12 mm long, 10–14 mm wide, rounded, ± obtuse or slightly acute, ± broadly triangular, with strongly involute margins, on the outside medium densely covered with short, straight or ± flexuose, appressed or ± spreading hairs of different lengths, on the inside densely covered with longer, straight or slightly flexuose, spreading hairs towards the margins and sinuses, and with appressed, straight hairs along the median line of the lobes; sinuses between the calyx lobes strongly expanded outwards; corolla up to 12 mm long (when lobes erect), pale green at first, turning yellow or yellow-orange when alive, adaxially glabrous; corolla tube 7–9 mm long, 7–8 mm wide, widest below the middle, with a 1 mm wide porelike aperture (see Fig. 2b) distally, glabrous inside, ± densely covered with ± spreading, straight to slightly bent hairs of different lengths on the outside; corolla lobes 3–3.5 mm long, 3.5–4 mm wide, acute, widest at or below the middle, abaxially medium densely covered with short, ± flexuose hairs along the median line of the lobes, ± glabrous elsewhere, adaxially glabrous; staminodia 4–8 per flower (4 in a 4-merous flower of Prévost 3430; 4 single and 1 paired in a 5-merous flower of Andel et al. 756; 2 single and 3 paired in a 5-merous flower of Ferraz et al. 766), 5–7 mm long, completely attached to the corolla tube except for the 0.8–1.5 mm long, ± acute, glabrous antherodes; adaxial side of the filaments glabrous proximally, densely covered with appressed, ± flexuose hairs distally; ovary 7 mm long (including stylodia), 5–6 mm in diameter, 8 (–10?)-locular, densely covered with ± straight, appressed hairs; stylodia 4, 3 mm long, free only distally, densely hairy proximally, ± glabrous distally; stigmata 1.5 mm long, widened distally; – **fruits** (Fig. 1e–f, 2e–f): stalk 5–10 mm long, 4–5 mm wide distally, covered with remnants of the indumentum; fruits ± oblate, up to 4.5–6 cm in diameter when dry (according to Henkel & Williams 2284: 5–10 cm in diameter), green or olive-green when immature, greenish-yellow, yellow [according to Kalloo B224, CHEESMAN 1947, MENNEGA et al. 1988], olive-green, olive-brown or remaining green when mature (yellowish or black-brown within), detaching with the calyx, glabrescent, except on apex where remnants of the indumentum persist; fruit wall 1.5–2 mm thick, with tightly adhering epidermis when dry; calyx on fruits up to 4.5 cm in diameter, undivided in the proximal 6–12 mm, green, glabrescent abaxially, with persistent indumentum adaxially (see the description of the female flowers); lobes ca. 15 (–20) mm long, 15–22 mm wide, rounded or obtuse; margins of the lobes ± involute when dry; sinuses between the calyx lobes expanded and bloated out- and downwards; seeds dark brown, bean-shaped, 18–23 mm long, 9–15 mm wide, 5–9 mm thick.

Note. Herbarium specimens from Pará and Maranhão apparently display only immature fruits. Flowers from these populations are needed for study. It is still unclear whether these collections really pertain to *D. cayennensis*. They have been placed here only tentatively.

Figures. leaves, flowers, fruit, seed (ANDEL 2000: fig 29, drawing); leaves, fruits (WALLNÖFER & MORI 2002: pl. 51c, color photo).

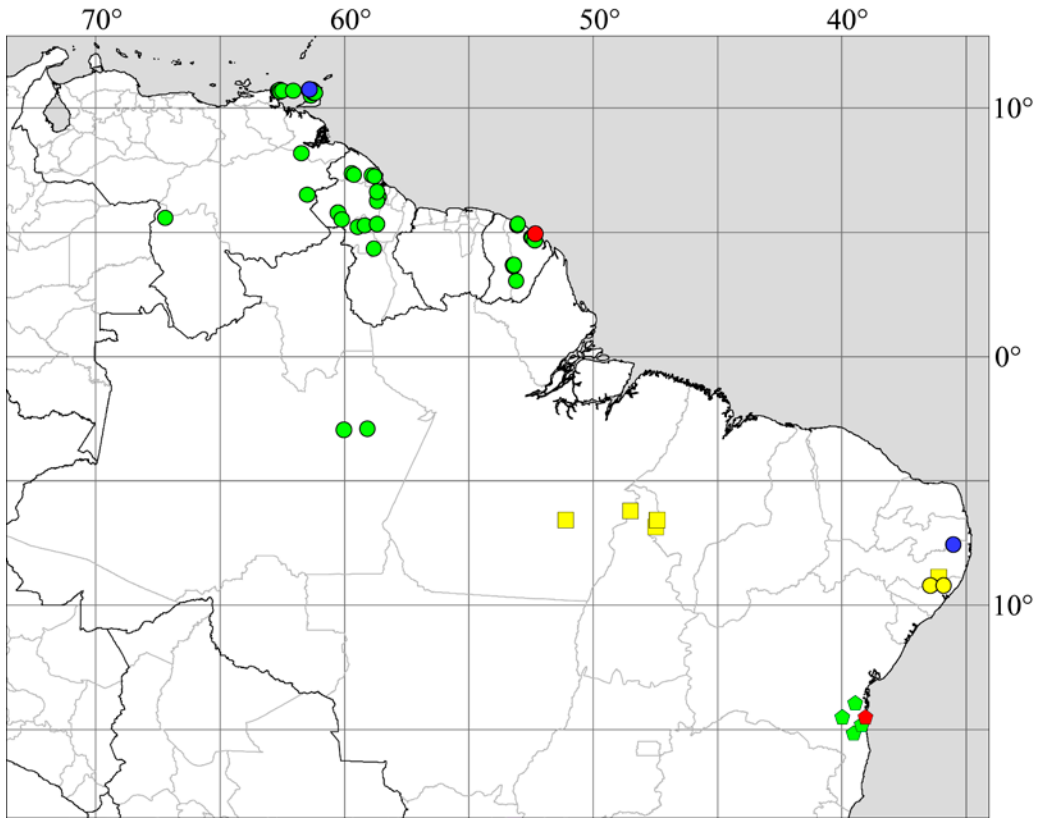


Fig. 3: Distribution of *Diospyros cayennensis* (●; locality of the lectotype: ●; type localities of *D. ierensis* in Trinidad and *D. serrana* in Pernambuco: ●; only digital photos of specimens seen: ●; doubtful specimens: ■); – *D. scottmorii* (◆; type locality: ◆).

Distribution. *Diospyros cayennensis* is known from eastern Venezuela (Sucre, Bolívar, Delta Amacuro, Amazonas), Trinidad, Guyana (Barima-Waini, Cuyuni-Mazaruni, Essequibo Islands-West Demerara, Pomeroon-Supenaam, Potaro-Siparuni, and Upper Demerara-Berbice), French Guiana (France), and Brazil (Alagoas, Amazonas, Pernambuco; it probably also occurs in Pará and Maranhão) (see Fig. 3). In eastern Amazonia, it is apparently a very rare species. It probably also occurs in Suriname, but I have not seen specimens from there.

Habitat. On the Peninsula de Paria (Sucre, Venezuela) it grows in primary cloud forests and was often reported from areas along rivers and creeks (Dumont et al. 7536, Morillo 2567, several collections of Steyermark), but also from a "selva siempre verde en la cumbre" (Steyermark & Rabe 96037). In the federal states of Bolívar and Delta Amacuro, *D. cayennensis* grows in rain forests (Bernardi 2122, Blanco 202, 260, Marcano 102, 271, 454). ESTRADA & WALLNÖFER (2007) reported it from "bosques ribereños y bosques siempreverdes".

BAKSH-COMEAU et al. (2016) indicated the habitat in Trinidad as follows: "evergreen seasonal forest and associated with palms in marsh forest, lower montane and montane

forests". BEARD (1946) estimated 23 individuals attaining the middle story and 180 individuals attaining the canopy layer in a 40 hectare forest in Trinidad.

Diospyros cayennensis ("*D. ierensis*") was reported in Guyana from the "wallaba forest on white sand" (Sandwith 1123, SANDWITH 1939), the "kakaralli-clump wallaba forest" (Forest Dep. Brit. Guiana 4236), "mora riparian forest" (Andel et al. 756), "moruca mixed forest" (ANDEL 2000, 2001), and "slope forest" (Henkel & Williams 2284) (for details on forest types see POLAK 1992). According to STEEGE et al. (1993a, 1993b), it is a dominant species in the "palm-swamp forest on histosols", and was often found in "creek forest on alluvial gleyic arenosols and dystic fluvisols". It was reported to be among the "twenty most abundant species in the palm swamp forest on peat soils" (STEEGE et al 1999).

In French Guiana (Guyane Française), it was found in "non-flooded moist forests" (Mori et al. 22298, 22913, 24985, Wallnöfer et al. 13464), in a "forêt primaire de bas fond inondable; sol hydromorphe" (Franceschi DDF 99), and on a "plateau inondé à la saison des pluies; formé par de larges et profondes crevasses; sol sablonneux en surface et couche d'argile en profondeur" (Bena 1231).

In the state of Amazonas in Brazil, it was collected in a periodically inundated forest ("igapó"; Rodrigues & Coêlho 7318) as well as in a non-inundated forest ("mata de terra firme"; Alencar s.n. INPA 28357). In the states of Pernambuco and Alagoas in northeastern Brazil, it occurs in highly isolated (relict) patches of an altitudinal wet forest type, which is called "floresta serrana dos brejos de altitude" and which lies within an arid region (SOTHERS 2003; FERRAZ & RODAL 2006, 2008; LUCENA 2009; SANTOS et al. 2022). In these forests, it is a canopy tree and was reported to reach an absolute density of 12 individuals per hectare (FERRAZ & RODAL 2006, erroneously who cited it as "*D. guianensis*"). The habitat in Alagoas was indicated as "forêt ombrophile submontagnarde de plateau marécageux (à Cyclantaceae) en bordure de ruisseau" by Nusbaumer et al. LN 4624. In the Mata Atlântica, it was classified by SANTOS & SANO (2009) as a species of the "floresta estacional semidecidual".

Phenology (based on herbarium specimen data). Venezuela: flowering from Jun. to Sep., in Nov. and Dec., fruiting from Feb. to Apr., in Jul., Aug. and Dec.; – Trinidad: fl. in May, Sep., Dec., fr. from Feb. to May; – Guyana: fl. in Jan., Apr., Aug., Sep., Nov., fr. in Mar., May, Jun., Jul., Sep.; – French Guiana: fl. in Feb., Mar., May, Aug., Oct., Nov., fr. in Feb., Sep., Nov.; – Brazil, Amazonas: fl. in Nov., fr. in Sep.; Alagoas and Pernambuco: fl. in Dec., fr. in Jul., Oct., Dec.

Biology. According to NELSON et al. (2011), the "Trinidad piping-guan" or "pawi" (*Pipile pipile*, Aves) eats the flowers and fruits. CUMMINGS (2013) reports that the fruits are eaten by tapirs and birds. The mesocarp of the fruits is said to be part of the diet of white-faced sakis (*Pithecia pithecia*, a monkey) in Suriname (ANZELC 2009), and of the wedge-capped capuchin (*Cebus olivaceus*, also a monkey) in the Llanos of Venezuela (ROBINSON 1984). However, as *D. cayennensis* ("*D. ierensis*") seems not to occur there, the corresponding fruits could have been misidentified. It is regarded by LOBOVA et al. (2009) as a "possible bat-dispersed species". This hypothesis is supported by the fact that the fruits are reported to remain green or to be dark colored at maturity.

Male flowers are generally shed after anthesis. At least in Trinidad, however, they are not shed as a whole; only the corolla detaches, whereas the calyx subsequently enlarges

very much and becomes yellow. This peculiarity was previously observed by SANDWITH (1939), who wrote "calyx orange-yellow after fall of corolla", and can be seen also on photos of the living plant, which were taken by J. Francisco Morales (TRIN) in 2021 (Fig. 2c–d). This peculiarity is not known from any other neotropical species of *Diospyros* and may be a response to predation of the flowers by the bird "pawi" (see above). These enlarged, postanthetic calyces could distract the bird from eating the preanthetic flowers. Observations in the field are necessary to confirm this assumption. It is not known whether this peculiarity also occurs in other areas within the distributional range of the species.

According to Mori et al. (22298), it probably flowers at night. The growth architecture conforms to Massart's model (see HALLÉ et al. 1978). The growth and survival of the seedlings were studied by BOOT (1994, 1996), and the anatomy of the leaves by PARMENTIER (1892) and BUSCH (1913). According to STEEGE (2000), the wood density is 0.56 g cm⁻³.

Vernacular names. In Pernambuco (**Brazil**) it is called "laranjinha" (Ferraz et al. 766, 767, SOTHERS 2003); in **French Guiana** (Guyane Française) "baaka-tikii" (De Franceschi DDF 99, Thiel 407), "bois charbon" (Bena 1231), and "bois négresse" (Bena 1231). The names used in **Guyana** are: "achi-poko" (Henkel & Williams 2284), "barabara" (Arawak language; Fanshawe F1500, F1784, F3553, MENNEGA et al. 1988, EK & HOUT 1997, EK & STEEGE 1997, ANDEL 2000, OUTER 2001, KLOOSTER et al. 2003), "barabara" (Hohenkerk 109A/P13, Forest Dep. Brit. Guiana 109, Jenman 4003), "barabara of wallaba" (Arawak language; SANDWITH 1939), "barrabarra" (Andel et al. 756), "charcoal barabara" (EK & STEEGE 1997), "graterwood" (Creole language; Andel et al. 1150, ANDEL 2000), "perakuruk" (Akawaio language; MENNEGA et al. 1988, OUTER 2001), "simyari epi" (Carib language; Andel et al. 1150, ANDEL 2000), "tarara" (Carib language; MENNEGA et al. 1988, ANDEL 2000, OUTER 2001, KLOOSTER et al. 2003). As no voucher could be verified, the names "perakuruk" and "tarara" need to be confirmed. – In **Trinidad** it is named "bois charbon" (Brooks 11635, CHEESMAN 1947, BAKSH-COMEAU et al. 2016), "ironwood" (NELSON et al. 2011), and "sab-la-hatch" (Dannouse TRIN 6415), and in **Venezuela** (federal states of Bolívar and Delta Amacuro) "aracho" (Blanco 202), "barabá" (Marcano 271, 454, ROTH 1987), "carbón" (Blanco 260, Marcano 102, 401), "yara-yara negra" (Bernardi 2122), and in the federal state of Sucre "concho de piedra" (Marcano 1441, Steyermark 95051, 96037, 121690). All but one of these Venezuelan names are also given by SOTHERS & BERRY (1998), and ESTRADA & WALLNÖFER (2007).

Use. The wood was used in Bolívar (Venezuela) for furniture (Bernardi 2122), in French Guiana (Guyane Française) in carpentry (Bena 1231 indicates: "bon pour charpente, planches, poteaux"), and in Guyana for construction (Andel et al. 1150). Henkel & Williams 2284, and Andel et al. 756 reported that the fruits are edible, whereas Andel et al. 1150 noted that they are not. SLOOTEN (1970) evaluated the wood for veneer and plywood manufacture and classed "*D. ierensis*" as good. According to CUMMINGS (2013), it is used as fuelwood in the region of Rupununi (Guyana).

Specimens examined: **Trinidad & Tobago**, Arima-Blanchisseuse Road, 1800 ft., [ca. 10°43' N, 61°18' W], forest, (fr), 4 Mar. 1962, **M.B. Kalloo B224** [NY (+ carp.)], "tree 15–20 ft.; fruit green, yellow when mature"; – Mount Blue ridge, Aripo-Blanchisseuse road, from the Antenna 15 minutes walking towards Mt. Blue, 585–695 m, 10°43'23" N, 61°18'24" W, primary, premontane forest, "with the prevalence of clouds and epiphytes", (fl male), 4 Dec. 2021, **J.F. Morales 21949** [MO n.s., TRIN n.s. (photos of the living plant and of some unmounted specimens seen)], "tree ca. 6 m; flowers yellow"; – St. George, Maracas, [10°41' N,

61°24' W], (st), 20 May 1861, **s.coll. 125** [GOET]; – Aripo road near 2.25 mile post, [ca. 10°40' N, 61°15' W], (fr), 4 Mar. 1927, **W.E. Broadway 6586** [BM, FHO 2× (+ carp.), MO, S], "tree; fruit green color"; – Aripo road near end of forest, [ca. 10°40' N, 61°15' W], (fl male), 25 May 1930, **W.E. Broadway 7593** [BM, F, G 2×, K, MG n.s. (fragm., dig. photo), MO, S, US], "tree"; – St. George, Trinidad, Guanapo, [10°36' N, 61°15' W], (fl male), Sep. 1898, **L. Dannouse s.n. TRIN 6415** [K, NY, TRIN n.s.]; – St. Andrew, Trinidad, long stretch forest, low altitude, [10°36' N, 61°11' W], forest, (fr), 2 Apr. 1953, **R.E.D. Baker & N.W. Simmonds 14934** [K 2× (+ carp.)], "fruits greenish-yellow, ripe, soft, interior black-brown, semi-liquid"; – St. Andrew, Long stretch, about 24-mile post, [ca. 10°36' N, 61°11' W], (fr), 4 Feb. 1927, **W.E. Broadway 6550** [FHO]; – Trinidad Botanic Garden, native, [ca. 10°30' N, 61°20' W], (fr), May 1890, **J.H. Hart s.n.** [K]; – without further data, (fr), 19 Mar. 1926, **W.E. Broadway s.n.** [F]; – (fl male), s.d., **R.S. Brooks 11635** [FHO 2×, OXF/FHO (wood)].

Venezuela, Amazonas, Dept. Atures, ca. 4 km de la desembocadura del Caño Colorado, afluente del Río Cataniapo, ca. 50 km SE de Pto. Ayacucho, 100–130 m, 5°34' N, 67°12' W, transecto desde bosque medio ralo en planicie ribereña hasta elevación a unos 30 m por sobre el nivel del caño, con bosque medio denso, (fr), 5 Aug. 1981, **F. Guanchez 1465** [FHO, TFAV n.s.], "árbol ca. 10 m, asilado y poco frecuente a orillas del caño; frutos verde oliva cuando inmaduros, marrón-aceituna cuando maduros, 5 cm diámetro; fructificación abundante". – **Bolívar**, 30 km sur de El Dorado, [ca. 6°30' N, 61°30' W], bosque pluvial, (fr), 6 Apr. 1955, **L. Bernardi 2122** [FI n.s. (dig. photos), G, MER n.s. (dig. photo), NY 2×, VEN n.s.], "árbol 25 metros, esbelto, algo escaso". – **Delta Amacuro**, E de Río Grande, E–NE de El Palmar, cerca de los límites del Estado Bolívar, [ca. 8°10' N, 61°44' W], bosque pluvial, (fr), 25 Feb. 1964, **L. Marciano B. 102** [BR, COL n.s. (dig. photo), GB, GH, K (+ carp.), MER n.s. (dig. photo), MO, P, S, U, US, VEN n.s.], "árbol ± 25 m × 48 cm D.A.P.; fruto de color verde, polispermo; endocarpio amarillo"; – same area: (fl male), 28 Jun. 1964, **L. Marciano B. 271** [AMAZ n.s., F, FHO, K, MO 2×, MY n.s., NY 3×, U, US, VEN n.s.], "árbol 26 m alto × 28 cm D.A.P.; cáliz amarillo verdoso; corola con el tubo amarillento y los lóbulos marrones"; – (fl male), 19 Aug.–7 Sep. 1964, **L. Marciano B. 401** [AMAZ n.s., COL n.s. (dig. photo), INPA, MBM, MER 2× n.s. (dig. photos), MY n.s., SP n.s., VEN n.s.], "árbol; corola con el tubo verdoso y los lóbulos amarillo-brillantes"; – (fl buds male), 29 Nov.–18 Dec. 1964, **L. Marciano B. 454** [MER n.s. (dig. photo), NY, US, VEN n.s.], "árbol 26 m × 28 cm D.A.P.; frutos inmaduros, epicarpio amarillento"; – (fr), 29 Jun.–23 Jul. 1965, **C. Blanco 202** [MER 2× n.s. (dig. photos), NY 2×, US n.s. (dig. photo), VEN n.s.], "arbolito; fruto con 7 semillas; cáliz fuerte"; – (fl male), 14 Sep. 1965, **C. Blanco C. 260** [MER 3× n.s. (dig. photos), MO, NY 3×, VEN n.s.], "flores de perianto fuerte, amarillas"; – Campamento "La Quebrada", Reserva Forestal de Imataca, [ca. 8°10' N, 61°44' W], (fl male), 21–29 Jun. 1964, **L. Marciano B. 271** [F, INPA n.s. (dig. photo), MER n.s. (dig. photo), MG, RFA n.s. (dig. photo), U], "árbol 26 m × 28 cm DAP; corola con el tubo amarillento y los lóbulos marrones". – **Sucre**, Península de Paria, above Las Melenas, N of Río Grande Arriba, SE of Cerro de Humo, 730–1050 m, 10°42' N, 62°37' W, virgin cloud forest, (fl male), 1 Dec. 1979, **J.A. Steyermark & R.L. Liesner 120854** [MO, VEN n.s.], "tree 15 m"; – a lo largo do Río Arriba, 25–30 km NO [N] de Irapa, NO do Cerro Humo, 800–1000 m, [10°43' N, 62°35' W], bosque nublado, virgen a lo largo do Río, (fl male), 9–10 Jul. 1972, **G. Morillo 2567** [VEN n.s. (dig. photo)], "arbusto; hojas coriáceas, fruto verde"; – tributary headwaters of Río Cumaná, SW of Cerro de Humo, vicinity of Manacal, 15 km (by air) NW of Irapa, 800 m, 10°41'5" N, 62°39'5" W, cloud forest, (fl male), 29 Nov. 1979, **J.A. Steyermark & R.L. Liesner 120624** [FHO, VEN n.s.], "common tree 15 m; leaves subcoriaceous, dark green above, paler green below; calyx pale green; fruit dull green"; – Distr. Arismendi, between Tacarigua and headwaters of Río Tacarigua, E of Cerro de Humo, N of Río Grande Arriba, between ranch house and summit of ridge, 700–900 m, 10°41–42' N, 62°36–37' W, (fr), 23 Feb. 1980, **J.A. Steyermark et al. 121690** [FHO, MO, VEN n.s.], "tree 15 m; leaves coriaceous, dark green above, dull green below"; – Distrito Mariño, a lo largo de Río Arriba, afluente del Río Santa Isabel, ca. 25–30 km NO [NW] de Irapa, NO [NW] de Cerro Humo, ca. 800–1000 m, 10°41' N, 62°37' W, bosque nublado virgen, (defl male), 11 Jul. 1972, **K. Dumont et al. 7536** [NY, VEN n.s.], "arbusto de hojas coriáceas; frutos verdes"; – Camino de la Costa, al norte de Pueblo Nuevo, al N. O. [NW] de Irapa, 800 m, [ca. 10°40' N, 62°40' W], (fr), 10 Dec. 1966, **L. Marciano B. 1441** [MER 2× n.s. (dig. photos)], "árbol ca. 25 cm de diámetro; fruto inmaduro, esférico, con el cáliz acrecente"; – Cerro Espejo, cumbre entre Manacal y Paují, arriba de Mundo Nuevo, arriba de Río Seco de Irapa, 750–850 m, [ca. 10°38' N, 62°35' W], selva siempre verde en la cumbre, (fl female), 6 Aug. 1966, **J.A. Steyermark & M. Rabe 96037** [MER n.s., MY n.s. (dig. photo), NY, P, S, U, US, VEN n.s.], "tree 8 m; flowers pale green at first, turning yellow"; – Península de Paria, NE de Irapa, Cerro de Humo, laderas que miran al sur, entre la Laguna y Roma, 800–1000 m, [10°40' N, 62°30' W], bosque húmedo nublado, (fr), 5 Mar. 1966, **J.A. Steyermark 95051** [F, K, NY (+ carp.), US, VEN n.s., WAG], "tree 15 m; leaves coriaceous, deep green above,

dull green below; fruit globose, olive green"; – Cerro Patao, N de Puerto de Hierro, NE de Güiria, 850–860 m, [10°41' N, 62°3' W], selva siempre verde, quebrada con riachuelo, arriba del campamento, abajo de la fila, por debajo de la cumbre, (flbuds), 20 Jul. 1962, **J.A. Steyermark & G. Agostini 91154** [K, MER n.s. (dig. photo), US, VEN n.s.], "tree 20 m; leaves coriaceous, dark green above, dull paler green below"; – same data and collectors: (fr), **91196** [K (+ carp.), MER n.s. (dig. photo), US n.s. (dig. photo), VEN n.s.], "tree 10 m; leaves subchartaceous-subcoriaceous, deep green above, paler green below; fruit subglobose, green, 5–6 cm broad, 3–4 cm high, yellowish within"; – same data and collectors: 870 m, [10°41' N, 62°3' W], quebrada húmeda con riachuelo, bajo de la fila de la cumbre, (fl male), 25–26 Jul. 1962, **91352** [FT, K, MER n.s. (dig. photo), US], "tree 25 m; leaves coriaceous, dark green above, pale green below; calyx tube campanulate-conic, olive green without, yellow within, lobes depressed in center, rich green; corolla-tube yellow green below; corolla lobes deep yellow; anthers buff".

Guyana, Barima-Waini, Barama River, North-West District, forest around Kariako [= Kariaku or Kariakau] Village, 145 m, 7°22' N, 59°42' W, mora riparian forest, (fl female, fr), 5 Jan. 1996, **T. van Andel et al. 756** [U (+ carp. + flowers in alcohol), W], "large tree; dead bark grey, black and white patches; inner bark yellow; wood whitish-yellow; bark and wood turn more yellow after a while after being exposed to air; young leaves turn brown quickly when cut; leaves yellowish-green, fleshy; flowers green; calyx folded around corolla like a star; 4 stamens [staminodia!]; flowers collected from ground"; – Blue Mountain, Kokerite, Barama River, 200 m, 7°18' N, 59°36' W, high forest, (fr), 17 Sep. 1996, **T. van Andel et al. 1150** [U (+ carp.), W], "medium sized tree; outer bark green/black with fine, sharp creases; leaves leathery; fruits round, as big as an apple, green, hard with characteristic calyx, not edible". – **Pomeroon-Supenaam**, Issororo, Pomeroon River, [7°17' N, 58°53' W], (fr), 8 Jun. 1909, **Forest Dep. Brit. Guiana 109** [FHO (only carp. seen)]; – Essequibo County, Kamwatta Creek, Koirimap River, Pomeroon River, [7°14' N, 58°47' W], (fl male, fr), 6 Jul. 1918, **L.S. Hohenkerk 109A (P13)** [K (+ carp.)]. – **Essequibo Islands-West Demerara**, White Creek, Groete Creek, Essequibo River, [6°37' N, 58°40' W], mixed forest on loam, (fl male), 4 Apr. 1944, **Forest Dep. Brit. Guiana 4520 (= D.B. Fanshawe F1784)** [K, NY, OXF/FHO (wood), U], "tree 90 ft., 16 in. diam., unbuttressed; bark like charcoal; leaves thinly leathery; male flowers 1–3 per axil, shortly stalked; calyx lobes pale cream, green-margined, margin revolute and involute; corolla tubular, whitish, fleshy; lobes patent, apex revolute". – **Cuyuni-Mazaruni**, Bartica, [6°24' N, 58°37' W], (st), 20 Oct. 1952, **Forest Dep. Brit. Guiana 7149 (= D.B. Fanshawe F3553)** [K], "seedlings of barabara 3.5–4 months old from forest nursery"; – Bartica-Potaro road near 14th milepost [SANDWITH 1939: "near Barabara Creek"], [ca. 6°15' N, 58°40' W], sandy wallaba forest, (fl male), 18 Aug. 1937, **N.Y. Sandwith 1123** [G, K 2×, NY, S, U], "large tree, 1 ft., 6 in. diam., with blackish bark; heartwood fairly pale yellow; calyx orange-yellow when mature; corolla-tube greenish-white; limb lobes reflexed, pale yellow, turning brown [SANDWITH 1939: "bark blackish, thinly longitudinally many-furrowed"]"; – Pakaraima Mts., basecamp on small tributary of Partang River, 8.6 km NE of Imbaimadai, 1.5 km W of basecamp at foot of peak marked 2840, 750 m, 5°46'36" N, 60°15'49" W, mixed forest; canopy 30 m; forest floor wet with dense organic matter, (fr), 27 May 1992, **B. Hoffman et al. 1899** [COL n.s. (dig. photo), FHO, INPA n.s. (dig. photo), US n.s. (dig. photo)], "tree 12 m × 40 cm; fruit green"; – Upper Mazaruni River Basin, Ayanganna Plateau, forest bordering Haieka Savannah, E side of Haieka R [River], 2 miles E of Chinowieng Village, 740 m, [5°30' N, 60°7' W], (flbuds male), 22 Aug. 1960, **S.S. Tillett et al. 45265** [FHO, NY, US], "tree to 12 m, 6 dm base diam., frequent; leaves dark green above, lighter beneath, coriaceous; calyx green, plicate; corolla tube green; lobes blackish-brown; anthers green". – **Upper Demerara-Berbice**, West Demerara Region, Mabura Hill area, 150–200 m, 5°20' N, 58°40' W, swamp forest on sandy loam, (fr), 5 Jun. 1986, **J.J. Pipoly 7551** [CAY, COL n.s. (dig. photo), FHO 2× (+ carp.), G, GB, NY, P (+ carp.), U, US, WAG], "tree 15 m × 28 cm; wood brittle; fruit green"; – upper Demerara River, (fl), Sep. 1887, **G.S. Jenman 4003** [K (flowers in the capsule only)]. – **Potaro-Siparuni**, Kaieteur National Park, Kaieteur-Tukeit trail, from third colonial bridge to Tukeit, 100–200 m, 5°12' N, 59°28' W, mixed hardwood slope forest on sandstone derived soils; large trees on terraces including *Dicymbe* sp., (fr), 18 Jul. 1993, **T.W. Henkel & R. Williams 2284** [CAY n.s., MO (+ carp.), U, US n.s. (dig. photo)], "tree 25 m; fruit olive green, black and viscous interiorly, subglobose, 5–10 cm diam.; fruit edible"; – Bartica-Potaro Road, 107 m, [5°15' N, 59°10' W], kakaralli-clump wallaba forest, (fl male), 16 Nov. 1943, **Forest Dep. Brit. Guiana 4236 (= D.B. Fanshawe F1500)** [K 2×, NY], "tree 90 ft., 16 in. diam., unbuttressed, with charcoal-like bark; leaves leathery, glaucescent below; flowers subsessile, 1–3 together; buds green; calyx yellow green, fleshy, pubescent; lobes erect-patent, margins somewhat revolute"; – Iwokrama Rain Forest Reserve, Iwokrama Mts., 1–2 km SE of camp at bottom of gorge, 150–200 m, 4°20' N, 58°48' W, dense forest on brown sand; with *Mora*, *Eschweilera* & *Chlorocardium*, (fr), 25 Mar. 1997, **D. Clarke et al. 4267** [MO, U (+ carp.), US n.s. (dig. photo)], "tree 17 m; fruits and sepals green".

Guyane Française (France), Piste de St. Elie, [5°20' N, 53°1' W], forêt primaire, sur sol à drainage vertical libre, (st), 27 Feb. 1988, **D. De Franceschi DDF 98** [CAY n.s., FHO, P], "arbre; modèle de Massart; tronc cylindrique à empattement et racines traçantes; écorce gris noirâtre; stries longitudinales profondes et serrées; rhytidome très dur à aspect de charbon de bois; jeunes feuilles vert clair; fruit vert"; – same area: forêt primaire de bas fond inondable; sol hydromorphe, (st), 27 Feb. 1988, **D. De Franceschi DDF 99** [FHO], "arbre; modèle de Massart; tronc noir, lisse, cylindrique, avec de légères stries horizontales; feuilles vert sombre, glands visibles face inférieure du limbe, 2–3 par champ intersecondaire, près de la nervure principale; jeunes feuilles vert clair"; – same area: (fl female, fr), 29 Mar. 1984, **D. Sabatier 834** [B, CAY 2×, FHO, NY, P, U, US], "arbre moyen; tronc droit cylindrique base empâtée; écorce noirâtre avec profondes gerçures longitudinales très serrées; rhytidome cassant très dur noir anthracite; fruit vert (atteignant 5 cm de diam.); bouton floral vert jaunâtre"; – same area: forêt bas-fond, (fr), 10 Feb. 1987, **B. Riéra 1255** [CAY], "arbuste; feuilles aspect cireux; fruits globuleux"; – Station de la Piste de St. Elie (ECEREX), 5°18' N, 53°3' W, forêt primaire, (st), 14 Mar. 1998, **M.-F. Prévost & D. Sabatier 3478** [CAY n.s., W], "arbre 15 m, stérile; tronc fissure longitudinalement; rhytidome très dur; feuilles des axes plagiotropes à court pétiole canaliculé; limbe luisant face supérieure, atteint 20 × 6 cm; nervures déprimées face supérieure et saillantes face inférieure; nervures II en arceaux réunis avant la marge"; – same area: 5°17' N, 53°3' W, forêt primaire, (fr), 23 Sep. 1998, **M.-F. Prévost & D. Sabatier 3574** [CAY n.s., W (+ fruits in alcohol)], "arbre 28 m; DBH 39 cm; écorce avec rhytidome en réseau quadrillé; limbe légèrement coriace atteint 17 × 7 cm; fruits isolés, verts, 4–5 × 3,5 cm; court pédicelle trapu; calice à 4 grands sépales 1,5 à 2 cm; à maturité le fruit reste vert"; – same area: Point-Quadrat PM, km 15,7, layon crique Toussaint partant du camp ORSTOM, deuxième colline, 5°17' N, 53°3' W, forêt primaire, (fr), 7 Nov. 2001, **M.-F. Prévost & D. Sabatier 4253** [CAY n.s., MO n.s., W], "arbre DBH 25,2 cm; écorce du tronc et des axes noire; court pétiole épais, canaliculé; limbe discoloré, coriace, luisant sur les 2 faces, marge ourlée, atteint 23 × 10 cm; nervure I déprimée face supérieure et arrondie très saillante face inférieure; fruits isolés, 4 sépales verts; fruits non mûrs, verts, 3 × 3,5 cm"; – same area: Parcelle PSE10B, 5°17' N, 53°3' W, forêt primaire, (fl male), 19 Nov. 2003, **M.-F. Prévost & D. Sabatier 4802** [CAY n.s., W], "arbre, DBH 37,2 cm; feuilles à limbe souple, marge ourlée, atteignant 18 × 8 cm; inflorescences axillaires des axes latéraux feuillés; une ou plusieurs fleurs par aisselle (court pédoncule); calice jaune à grands sépales 1,5 cm; deux petites bractées à la base; fleurs à tube et lobes jaunes; les lobes s'oxydant rapidement en noir"; – same area: (st), 4 Nov. 1999, **D. Sabatier & M.-F. Prévost 4628** [CAY n.s., W], "arbre DBH 15,6 cm; pétiole épais en gouttière; limbe chartacé souple, discoloré à marge ourlée, atteint 22 × 9 cm; nervure I plane à déprimée face supérieure et arrondie saillante face inférieure; nervures II sensibles à l'ongle dessus et saillantes dessous; nervures III en réseau lâche"; – same area: 5°16' N, 53°3' W, (st), 13 Mar. 1998, **M.-F. Prévost & D. Sabatier 3474** [CAY n.s., W], "arbre 36 cm dbh, stérile; rhytidome très dur, strie longitudinalement; feuilles alternes à court pétiole canaliculé; limbe chartacé luisant face supérieure à marge légèrement ourlée atteint 18–20 × 6–7 cm; nervures I et II planes à déprimées face supérieure et saillante face inférieure surtout pour la primaire; nervures III plus ou moins scalariformes et nervilles en réseau lâche"; – Centre ORSTOM de Cayenne, 4°56'53" N, 52°19'4" W, jardin, (fl female), 6 Feb. 1998, **M.-F. Prévost 3430** [CAY n.s., W (+ flowers in alcohol)], "arbre 5 m, 7 cm dbh; feuilles distiques; limbe légèrement coriace à marge révoluée atteint 15 × 5 cm; nervure I jaunâtre; nervures I et II planes face supérieure; nervure I arrondie très saillante et nervures II en arceaux sensibles à l'ongle face inférieure; calice vert avec 4 sépales soudés; corolle jaune orange avec 4 lobes"; – Rivière Cascade, Rive gauche de la crique Bellevue à 1 km, 500 en amont du dégrat de M. Madère Victor et à 200 m de la rive, [4°47' N, 52°28' W], plateau inondé à la saison des pluies; formé par de larges et profondes crevasses; sol sablonneux en surface et couche d'argile en profondeur, (yfr), 28 Nov. 1956, **P. Bena 1231** [CAY 3×, U 2× + wood sample U5720], "fruits de couleur vert pâle à 4 cotes très prononcées 13 à 14 mm de diam."; – Exploitation Sipriot, [4°46' N, 52°26' W], (defl male), 29 Jun. 1978, **J. Thiel 407** [CAY 2×]; – rivière Comté, à proximité de la route N2, [4°39' N, 52°21' W], forêt primaire, (fl male), 28 Oct. 1981, **F. Billiet & B. Jadin 1184** [CAY n.s., BR], "4 sépales verts, réfléchis"; – Saül and vicinity: near Eaux Claires (5–7 km NNW of Saül), Sentier Botanique, a collecting and tourist trail NE of Eaux Claires, right loop of trail leading away from entrance, 2–4 km from entrance, ca. 300–400 m, 3°37' N, 53°12' W [correct is ca. 3°41' N, 53°13' W], non-flooded, moist forest, (fl male), 15 Aug. 1999, **S.A. Mori et al. 24985** [CAY n.s. (photocopy seen)], "tree 25 m × 35 cm; calyx yellow; corolla yellow green; flowers oxidize black"; – from the same tree: 25 May 1992, **S.A. Mori et al. 22298** [CAY, L n.s. (dig. photo), NY n.s., P n.s. (dig. photo), US n.s. (dig. photo), W], "tree 40 m × 45 cm; outer bark nearly black, friable; inner bark yellow with white streaks; no open flowers on tree (1200 h), probably flowers at night; calyx and corollas from ground; calyx 4-merous, winged; corolla tube yellow green, with 4 contorted and strongly reflexed lobes, a few found with deep dark green corolla lobes which were not

reflexed"; – from the same tree: (defl male), 9 Nov. 1997, **B. Wallnöfer et al. 13464** [CAY, MA, NY, W 2× + woodsample], "tree 20 m, dbh 40 cm; trunk more or less cylindrical and without any remarkable enlargement at base; bark dark, with small longitudinal fissures, detaching in irregular oblong pieces; interior of dead bark black and very hard, interior of living bark light brown to yellowish; damages of bark not healing very well (termites observed within bark); branches slightly longitudinally fissured; interior of dead bark black; interior of living bark whitish to light brown, the innermost stripe (near xylem) becoming yellowish-orange after exposure to air; wood of branches light brown to whitish, very hard; adaxial leaf surfaces dark green, slightly glossy; midvein flat, lighter green; secondary veins only slightly prominent, lighter green; tertiary veins scarcely prominent; abaxial leaf surfaces lighter green, dull; midvein strongly prominent and lighter; secondary veins prominent; tertiary veins flat; leaf margins slightly revolute abaxially; old pedicels brown, 1–3 per leaf axil, pointing downwards"; – same area: (fr), 10 Feb. 1993, **S.A. Mori et al. 22913** [CAY, FHO, NY n.s., US n.s. (dig. photo), W (+ carp.)], "tree, in tree fall, size not known; fruits green"; – région N de Saül, tête de crique Saint Eloi, 3°41' N, 53°10' W, forêt primaire, (fr), 14 Feb. 1993, **F. Billiet & B. Jadin 5809** [CAY 2×, BR, P], "arbuste; calice à 4 sépales; gros fruits ronds verts"; – Saül, Monts La Fumée, 200–400 m, 3°37' N, 53°12' W, tropical moist forest, (fr), 11 Nov. 1982, **S.A. Mori & B.M. Boom 15197** [CAY, F n.s. (dig. photo), FHO, L n.s. (dig. photo), NY n.s., P n.s. (dig. photo), US n.s. (dig. photo), W], "tree 30 m × 40 cm; trunk fluted; bark with vertical cracks, black; slash with yellow at cambium"; – Mont Itoupé, Sommet Tabulaire, Point-quadrat Itoupé 2, 600 m, 3°1'13" N, 53°5'26" W, forêt primaire, (st), 14 Mar. 2010, **D. Sabatier & J.-F. Molino 5693** [CAY n.s. (dig. photo), W], "arbre, DBH 23 cm; rhytidome gris, finement gerçuré verticalement et strié longitudinalement; à la coupe cerne noir; écorce interne crème jaunâtre s'oxydant en jaune verdâtre, odeur de noix fraîche; feuilles laternes à limbe chartacé souple, marge ourlée et ondulée; nervure I déprimée face supérieure".

Brasil, Amazonas, estrada Manaus/Caracarai, km 20, área piloto da SUFRAMA, [2°57' S, 60°1' W], mata de terra firme, (fr), Sep. 1970, **J. Alencar s.n. INPA 28357** [INPA], "árvore"; – Manaus, estrada AM-1, km 175, picada 23 a 1760 m da estrada, [ca. 2°55' S, 59°4' W], igapó; solo úmido, (fl male), 27 Nov. 1965, **W. Rodrigues & D. Coêlho 7318** [FHO, INPA], "árvore 25 m × 30 cm diam.; flores verdes". – **Pará**, Ourilândia do Norte, Colônia Nosso Campos, Serra da Onça, [ca. 6°35' S, 51°7' W], vegetação baixa tipo serrado; solo argiloso vermelho com afloramentos rochosos, (fr), 30 Mar. 2003, **C. da S. Rosário & E. Almeida 2287** [MG n.s. (dig. photo)], "árvore 7 m; frutos imaturos verdes"; – São Geraldo do Araguaia, Serras das Andorinhas, ladeira do Bastão, 6°13' S, 48°28' W, mata, (fr), 5 Jul. 1995, **I. Aragão & M.N. Bastos 8** [IAN n.s., MG n.s. (dig. photo)], "árvore 12 m; frutos imaturos verdes". – **Maranhão**, Município Estreito, mata da fazenda Fronteira Alegre (canteiro de obras do AHE Estreito), [6°35' S, 47°27' W], mata; relevo suave ondulado; solo argilo-arenoso, (fr), 20 May 2005, **G. Pereira-Silva et al. 9424** [CEN n.s. (dig. photo), W], "árvore, frequente no local; fruto verde"; – Fazenda do Sr. Francisco do Leite, canteiro da obra AHE Estreito, 200 m, 6°35'19" S, 47°26'25" W, floresta semidecidual antropizada; relevo suave ondulado; solo arenoso com presença de matacões de plintossolo, (fr), 20 Oct. 2005, **G. Pereira-Silva et al. 10252** [CEN n.s. (dig. photo), W], "árvore 10 m, ocasional no local; frutos velhos"; – margem direita do rio Farinha, estrada para a fazenda do Sr. Sebastião Setalar, 150 m, 6°51'1" S, 47°28'31" W, mata ciliar; relevo suave ondulado; solo arenoso, (fr), 25 Apr. 2008, **G. Pereira-Silva et al. 13315** [CEN n.s. (dig. photo)], "árvore 14 m, frequente; frutos imaturos verdes". – **Pernambuco**, São Vicente Férrer, Mata do Estado, 600 m, 7°35' S, 35°30' W, mata úmida; solo argilo-arenoso; interior da mata do caidor, (fr), 15 Dec. 1999, **E.M.N. Ferraz et al. 767** [K, PEUFR n.s. (dig. photo)], "árvore ca. 30 m, frequente; quando cortados presença de exsudato escuro (preto); entrecasca branca na hora do corte, porém após alguns segundos fica totalmente amarela; frutos maduros enegrecidos, com cálice na mesma cor"; – Quipapá, Água Branca, estrada para o campo de aviação, [ca. 8°52' S, 36°6' W], margem da capoeira grossa, (fr), 11 Jul. 1950, **A. Lima 50-611** [IPA n.s., MG n.s. (dig. photo)], "árvore pequena; frutos verdes (imat.)" [the identification of this specimen is tentative!]; – **Alagoas**, Reserva Biológica Federal da Pedra Talhada, localidade de Quebrangulo, 840 m, 9.23651° S, 36.435877° W (WGS 84) [9°14'11.44" S, 36°26'9.16" W], forêt ombrophile submontagnarde de plateau, (fr), 9 Oct. 2015, **L. Nusbaumer & F. dos Santos Pereira LN 4600** [G 2× n.s. (dig. photos), JPB n.s., (+ photos of the living plant seen)], "arbre 24 m, 28 cm DBH; petits contreforts; écorce noire craquelée; fruit vert apiculé à 8–10 loges; calice accrescent à divisions inégales"; – Serra de Murici, localidade de Murici, Serra de Bananeira, 560 m, 9.218321° S, 35.877221° W (WGS 84) [9°13'5.96" S, 35°52'38.0" W], forêt ombrophile submontagnarde de plateau marécageux (à Cyclantaceae) en bordure de ruisseau, (fr), 15 Oct. 2015, **L. Nusbaumer et al. LN 4624** [G n.s. (dig. photo), JPB n.s., (+ photos of the living plant seen)], "arbre 15 m, 30 cm DBH; tronc noir craquelé; slash jaune; fruit immature, vert à 4 sépales; odeur de sperme; graine pyriformes beiges".



NATURHISTORISCHES MUSEUM WIEN BOTANISCHE ABTEILUNG
 Holotype of: Mori 11766
Diospyros scottmorii B. Walln.
 Ann. Naturhist. Mus. Wien, 8, 106: 247-249 (2005)
 30.9.2005 det./rev. B. WALLNOFER (W)

HERBÁRIO CENTRO DE PESQUISAS DO CACAU
 Plantas da Região Cacaueira da Bahia
 — BRASIL —
 Nº 11766 Ebenaceae
Diospyros
 Município de Urucuca. Nova estrada que liga Urucuca à Serra Grande, a 28-30 km de Urucuca. Região de Mata Microfílica Sul Baiana. Folha SD-24 (15-39a).
 Árvore, 22 m x 18 cm. Frutos verdes, 8-locular. Calice e corola verdes. Sementes com muito endosperma. Frutos separados.
 S.A.Mori 1 maio 1979

Fig. 4: Holotype of *Diospyros scottmorii* B.WALLN. [W].

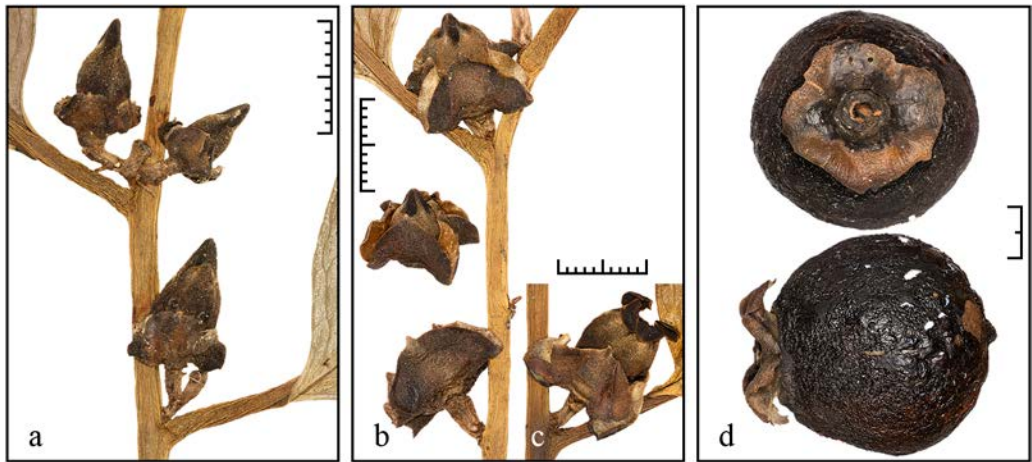


Fig. 5: *Diospyros scottmorii*: (a) male cymes (from Jesus 389 [FHO]); (b) female flowers (from Mori 11766 [W, isotype]); (c) female flower (from Santos 3803 [U]); (d) fruits (from Mori 11766 [W, holotype]); – scale = 1 cm.

Diospyros scottmorii B.WALLN., Ann. Naturhist. Mus. Wien, B, 106: 247–249 (2005); – [Fig. 3–5].

Typus. Brasil, Bahia, Município de Uruçuca, nova estrada que liga Uruçuca á Serra Grande, a 28–30 km de Uruçuca, [14°30' S, 39°3' W], Região de Mata Higrófila Sul Baiana, (flbuds female, fr), 1 May 1979, **S.A. Mori** 11766 [holotype: W (fr + carp., Fig. 4, 5d), isotypes: CEPEC n.s. (dig. photo), FHO, L n.s. (dig. photo), NY n.s. (dig. photos), W (flbuds female, Fig. 5b)]; "árvore 22 m × 18 cm; cálice e corola verdes; frutos verdes, 8-locular; sementes com muito endosperma".

For the description, see the protologue (WALLNÖFER 2005). Three color photos of the living plant of the collection Aona et al. 3468 can be seen at <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:326017-2/images>.

D. scottmorii is endemic to Bahia (Brazil) and is only known from eight collections (for its distribution see Fig. 3). It is a tree up to 22 m tall and has green flowers and fruits (only Paixão et al. 1861 indicated the fruits to be black). It occurs at elevations of 50–600 m in the "Região de Mata Higrófila Sul Baiana", and was collected in flower in March, May, and September, and in fruit in May, September, and November. Aona et al. 3468 indicated the habitat as "floresta ombrófila densa (mata atlântica) em sucessão avançada" (compare also SANTOS & SANO 2009).

Specimens examined: **Brasil, Bahia**, Ibirapitanga, Serra do Papua, APA do Pratigi, Trilha da Ladeira Grande, 568 m, 13°54'54" S, 39°27'48" W, floresta ombrófila densa (mata atlântica) em sucessão avançada, (fr), 28 Nov. 2013, **L.Y.S. Aona et al. 3468** [HURB n.s., K n.s., RB n.s. (dig. photo)], "árvore ca. 15 m; frutos imaturos verdes"; – Rio Grongogy [= Gongogi] Basin, 100–500 m, [ca. 14°30' S, 39°59' W], forest, (flbuds female, fr), 1 Oct.–30 Nov. 1915, **H.M. Curran 30** [GH n.s., RB n.s. (dig. photo), US 2×, WIS], "tree 15 ft. × 3 in."; – Município de Ilhéus, Área do CEPEC (Centro de Pesquisas do Cacau), km 22 da rodovia Ilhéus/Itabuna (BR-415), quadra D, 50 m, [14°47' S, 39°12' W], Região de Mata Higrófila Sul Baiana, (fr), 22 Sep. 1981, **T.S. dos Santos 3674** [FHO, MG], "arvorezinha 8 m; frutos imaturos verdes"; – same place: (st), 6 Feb.

1992, **S.C. de Sant'Ana et al. 186** [CEPEC n.s. (dig. photo), NY], "árvore 8 m × 10 cm; estéril"; – same place: (fl female), 27 Sep. 1982, **T.S. dos Santos 3803** [CEPEC n.s. (dig. photo), HEPH n.s. (dig. photo), U], "árvore de 8 m por 10 cm de diam.; flores esverdeadas; frutos imaturos verdes"; – same area: (fl male), 11 Mar. 1969, **J.A. de Jesus 389** [CEPEC n.s. (dig. photo), FHO, MG], "árvore 12 m × 15 cm diam.; flores em botões esverdeados"; – Jussari, estrada Jussari/Palмира, entrada à esquerda, ca. 7,5 km de Jussari, Fazenda Teimoso, RPPN Serra do Teimoso, 15°9'29" S, 39°31'43" W, (fr), 7 Nov. 2003, **J.L. Paixão et al. 1861** [CEPEC n.s. (dig. photo)], "árvore ca. 8 m; folhas fortemente discolores; cálice verde-claro; fruto preto".

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References

- ANZELC A., 2009: The foraging and travel patterns of white-faced sakis in Brownsberg Nature Park, Suriname: preliminary evidence for goal-directed foraging behavior. – Thesis submitted to Kent State University.
- ANDEL T.R. VAN, 2000: Non-timber forest products of the North-West District of Guyana. – Tropenbos-Guyana Series 8 (part I + II).
- ANDEL T. VAN, 2001: Floristic composition and diversity of mixed primary and secondary forests in northwest Guyana. – Biodiversity and Conservation 10 (10): 1645–1682.
- BAKSH-COMEAU Y.S., MAHARAJ S.S., ADAMS C.D., HARRIS S.A., FILER D.L. & HAWTHORNE W.D., 2016: An annotated checklist of the vascular plants of Trinidad and Tobago with analysis of vegetation types and botanical 'hotspots'. – Phytotaxa 250 (1): 1–431.
- BEARD J.S., 1946: The Mora forests of Trinidad, British West Indies. – Journal of Ecology 33 (2): 173–192.
- BEENTJE H. & WILLIAMSON J., 2010: The Kew plant glossary: an illustrated dictionary of plant terms. – Kew: Royal Botanic Gardens.
- BEENTJE H., CHEEK M. & WILLIAMSON J., 2003: Glossary. – In: BEENTJE H.J. & GHAZANFAR S.A., (ed.): Flora of Tropical East Africa. – Lisse: A.A. Balkema.
- BOOT R.G.A., 1994: Growth and survival of tropical rain forest tree seedlings in forest understorey and canopy openings: implications for forest management. – Tropenbos Documents 6: 1–55.
- BOOT R.G.A., 1996: The significance of seedling size and growth rate of tropical rain forest tree seedlings for regeneration in canopy openings. – In: SWAINE M.D. (ed.): The ecology of tropical forest tree seedlings. – Man and the Biosphere Series 17: 267–283.
- BRITTON N.L., 1922: Studies of West Indian plants – X. – Bulletin of the Torrey Botanical Club 48 (12): 327–343.
- BUSCH P., 1913: Anatomisch-systematische Untersuchung der Gattung *Diospyros*. – Inaugural-Dissertation (Erlangen), 1–95. – Crefeld: Wilhelm Greven.

- CANDOLLE A.L.P.P. DE, 1844: Ordo CXXV. Ebenaceae. – In: CANDOLLE A.L.P.P. DE (ed.): *Prodromus systematis naturalis regni vegetabilis*, 8: 209–243. – Paris: Fortin, Masson et Soc.
- CHEESMAN E.E., 1947: Ebenaceae. – In: WILLIAMS R.O. (ed.): *Flora of Trinidad and Tobago*, 2 (3): 138–139. – Port-of-Spain: Guardian Commercial Printery.
- CUMMINGS A.R., 2013: For logs, for traditional purposes and for food: identification of multiple-use plant species of northern Amazonia and an assessment of factors associated with their distribution. – Doctoral dissertation, Syracuse University. – <https://surface.syr.edu/etd/17>
- DUANGJAI S., WALLNÖFER B., SAMUEL R., MUNZINGER J. & CHASE M.W., 2006: Generic delimitation and relationships in Ebenaceae sensu lato: evidence from six plastid DNA regions. – *American Journal of Botany* 93 (12): 1808–1827.
- DUANGJAI S., SAMUEL R., MUNZINGER J., FOREST F., WALLNÖFER B., BARFUSS M.J.H., FISCHER G. & CHASE M.W., 2009: A multi-locus plastid phylogenetic analysis of the pantropical genus *Diospyros* (Ebenaceae), with an emphasis on the radiation and biogeographic origins of the New Caledonian endemic species. – *Molecular Phylogenetics and Evolution* 52: 602–620.
- EK R.C. & HOUT P. VAN DER, 1997: Botanical diversity of Greenheart dominated mixed rain forest near Mabura Hill, Guyana. – Chapter 4 in: EK R.C.: *Botanical diversity in the tropical rain forest of Guyana*. – *Tropenbos-Guyana Series* 4: 91–142.
- EK R.C. & STEEGE H. TER, 1997: The flora of the Mabura Hill area, Guyana. – Chapter 2 in: EK R.C.: *Botanical diversity in the tropical rain forest of Guyana*. – *Tropenbos-Guyana Series* 4: 27–63.
- ESTRADA J. & WALLNÖFER B., 2007: Ebenaceae. – In: DUNO DE STEFANO R., AYMARD G. & HUBER O., (eds.): *Catálogo anotado e ilustrado de la flora vascular de los Llanos de Venezuela*, 460–461. – Caracas: FUDENA / Fundación Empresas Polar / FIBV.
- FERRAZ E.M.N. & RODAL M.J.N., 2006: Caracterização fisionômica – estrutural de um remanescente de floresta ombrófila montana de Pernambuco, Brasil. – *Acta Botanica Brasilica* 20 (4): 911–926.
- FERRAZ E.M.N. & RODAL M.J.N., 2008: Floristic characterization of a remnant ombrophilous montane forest at São Vicente Férrer, Pernambuco, Brazil. – In: THOMAS W.W., (ed.): *The atlantic coastal forest of northeastern Brazil*. – *Memoires of the New York Botanical Garden* 100: 474–516.
- HALLÉ F., OLDEMAN R.A.A. & TOMLINSON P.B., 1978: *Tropical trees and forests*. – Berlin, Heidelberg, New York: Springer.
- KLOOSTER C.I.E.A. VAN'T, LINDEMAN J.C. & JANSEN-JACOBS M.J., 2003: Index of vernacular plant names of Suriname. – *Blumea*, Supplement 15: 1–322.
- LOBOVA T.A., GEISELMAN C.K. & MORI S.A., 2009: Seed dispersal by bats in the Neotropics. – *Memoires of the New York Botanical Garden* 101: 1–477.
- LUCENA M. de D.F.A., 2009: *Flora da Mata do Estado, São Vicente Férrer, Pernambuco, Brasil. Relatório Técnico*. – Recife: CEPAN (Centro de Pesquisas Ambientais do Nordeste).
- MENNEGA E.A., TAMMENS-DE ROOIJ W.C.M. & JANSEN-JACOBS M.J., 1988: Check-list of woody plants of Guyana. – *Tropenbos Technical Series* 2.
- NELSON H.P., DEVENISH C., BOBB-PRESCOTT N., NARANJIT A., NARANJIT K. & MCGOWAN P.J.K., 2011: *Pawi Species Recovery Strategy*. – <http://216.119.77.147/documents/PawiSpeciesRecoveryStrategyv2.pdf>
- OUTER R.W. DEN, 2001: *Vernacular names of Surinam woody plants*. – Wageningen University. (published in the internet)
- PARMENTIER P., 1892: *Histologie comparée des Ébénacées dans ses rapports avec la morphologie et l'histoire généalogique de ces plantes*. – *Annales de l'Université de Lyon* 6 (2): 1–155.

- POLAK A.M., 1992: Major timber trees of Guyana: a field guide. – Tropenbos Series 2: 1–272.
- ROBINSON J.G., 1984: Diurnal variation in foraging and diet in the wedge-capped capuchin *Cebus olivaceus*. – Folia Primatologica 43 (4): 216–228.
- ROTH I., 1987: Stratification of a tropical forest as seen in dispersal types. – Tasks for vegetation science 17. – Dordrecht: DR W. Junk Publishers.
- SANDWITH N.Y., 1939: Contributions to the flora of tropical America: XXXIX. – Bulletin of Miscellaneous Information 1939: 3–26.
- SANTOS E.A. DA C., OLIVEIRA E.V. DA S., SANTANA J.P., BRITO N.S., COSTA E.B. DE A., FIRMINO J., LEMOS R.P. DE L., SILVA J.W.A. & PRATA A.P. DO N., 2022: Distribuição e diversidade da flora vascular em cinco remanescentes naturais de Alagoas: síntese do conhecimento atual. – Pesquisa e Ensino em Ciências Exatas e da Natureza 6: e1850.
- SANTOS M.F. & SANO P.T., 2009: Ebenaceae. – In: STEHMANN J.R. et al. (eds.): Plantas da Floresta Atlântica, 239–240. – Rio de Janeiro: Jardim Botânico do Rio de Janeiro.
- SLOOTEN H.J. VAN DER, 1970: Forest industries development survey, Guyana. Evaluation study of eighteen wood species from Guyana for veneer and plywood manufacture. – FAO Report (FO: SF/GUY 9, Technical Report 13). [not seen]
- SOTHERS C.A., 2003: New species of *Diospyros* (Ebenaceae) from Brazil. – Kew Bulletin 58 (2): 473–477.
- SOTHERS C. & BERRY P.E., 1998: Ebenaceae. – In: BERRY P.E., HOLST B.K. & YATSKIEVYCH K. (eds.): Flora of the Venezuelan Guayana, 4: 704–712. – St. Louis: Missouri Botanical Garden Press.
- STEARNS W.T., 1992: Botanical Latin, 4th ed. – Newton Abbot Devon: David & Charles.
- STEEGE H. TER, 2000: Plant diversity in Guyana: with recommendations for a national protected area strategy. – Tropenbos Series 18: 1–220.
- STEEGE H. TER, JETTEN V.G., POLAK A.M. & WERGER M.J.A., 1993a: Tropical rain forest types and soil factors in a watershed area in Guyana. – Journal of Vegetation Science 4 (5): 705–716.
- STEEGE H. TER, JETTEN V., POLAK M. & WERGER M., 1993b: Tropical rain forest types and soils of a watershed in Guyana, South America. – In: STEEGE H. TER: Patterns in tropical rain forest in Guyana. – Tropenbos Series 3: 47–71.
- STEEGE H. TER, LILWAH R., EK R.C., HOUT P. VAN DER, THOMAS R.S., ESSEN J. VAN & JETTEN V.G., 1999: Composition and diversity of the rain forest in Central Guyana. An addendum to 'Soils of the rainforest in Central Guyana'. – Tropenbos-Guyana Reports 99-2: 1–51.
- THIERS B., 2022: see websites.
- WALLNÖFER B., 1999: Neue *Diospyros*-Arten (Ebenaceae) aus Südamerika. – Annalen des Naturhistorischen Museums in Wien, Serie B, 101: 565–592.
- WALLNÖFER B., 2000: Neue *Diospyros*-Arten (Ebenaceae) aus Südamerika – II. – Annalen des Naturhistorischen Museums in Wien, Serie B, 102: 417–433.
- WALLNÖFER B., 2001a: The Biology and Systematics of Ebenaceae: a Review. – Annalen des Naturhistorischen Museums in Wien, Serie B, 103: 485–512.
- WALLNÖFER B., 2001b: Lectotypification of *Diospyros cayennensis* A.DC. (Ebenaceae). – Taxon 50: 887–889 [see Erratum in Taxon 50 (4): 1319].
- WALLNÖFER B., 2003: A new species of *Diospyros* from southwestern Amazonia. – Annalen des Naturhistorischen Museums in Wien, Serie B, 104: 563–566.
- WALLNÖFER B., 2004a: A revision of *Lissocarpa* BENTH. (Ebenaceae subfam. Lissocarpoideae (GILG in ENGLER) B.WALLN.). – Annalen des Naturhistorischen Museums in Wien, Serie B, 105: 515–564.

- WALLNÖFER B., 2004b: Ebenaceae. – In: KUBITZKI K., (ed.): The families and genera of vascular plants, 6: 125–130. – Berlin, Heidelberg: Springer.
- WALLNÖFER B., 2004c: Lissocarpaceae. – In: KUBITZKI K., (ed.): The families and genera of vascular plants, 6: 236–238. – Berlin, Heidelberg: Springer.
- WALLNÖFER B., 2005: New species of *Diospyros* (Ebenaceae) from the Neotropics and additional information on *D. apeibacarpus*. – Annalen des Naturhistorischen Museums in Wien, Serie B, 106: 237–253.
- WALLNÖFER B., 2007–2022: A revision of neotropical *Diospyros* (Ebenaceae): part 1–15. – Annalen des Naturhistorischen Museums in Wien, Serie B, 108: 207–247, 110: 173–211, 111: 101–133, 112: 181–220, 113: 223–251, 115: 219–235, 116: 153–179, 117: 151–218, 118: 79–114, 119: 183–226, 120: 145–226, 121: 271–298, 122: 205–243, 123: 323–348, 124: 301–329.
- WALLNÖFER B., 2008a: Ebenaceae. – In: HOKCHE O., BERRY P.E. & HUBER O., (eds.): Nuevo Catálogo de la Flora Vascular de Venezuela, 356–357. – Caracas: Fundación Instituto Botánico de Venezuela Dr. Tobías Lasser.
- WALLNÖFER B., 2008b: Ebenaceae. – In: ZULOAGA F.O., MORRONE O. & BELGRANO M.J., (eds.): Catálogo de las Plantas Vasculares del Cono Sur. – Monographs in Systematic Botany from the Missouri Botanical Garden 107: 1987.
- WALLNÖFER B., 2010a: Ebenaceae. – In: FORZZA R.C. et al., (eds.): Catálogo de plantas e fungos do Brasil 2: 931–932. – Rio de Janeiro: Jardim Botânico do Rio de Janeiro.
- WALLNÖFER B., 2010b: Ebenaceae. – In: Lista de espécies da flora do Brasil. – Jardim Botânico do Rio de Janeiro. – <http://floradobrasil.jbrj.gov.br/2010/>.
- WALLNÖFER B., 2010c: Ebenaceae. – In: Flora de la Península de Yucatán. – Herbario CICY, Mérida, Yucatán, México. – <http://www.cicy.mx/sitios/flora%20digital/index.php>
- WALLNÖFER B., (ed.), 2012: Ebenabase: Ebenaceae GSD (version 1.0). – In: BISBY F. et al., (eds.): Species 2000 & ITIS Catalogue of Life, 24th September 2012. – Reading, UK: Species 2000. – Digital resource at www.catalogueoflife.org/col/.
- WALLNÖFER B., 2015a: Ebenaceae. – In: BERNAL R., GRADSTEIN S.R. & CELIS M., (eds.): Catálogo de plantas y líquenes de Colombia. – Bogotá: Instituto de Ciencias Naturales, Universidad Nacional de Colombia. – <http://catalogoplantasdecolombia.unal.edu.co/es/>.
- WALLNÖFER B., 2015b: A new species and two new synonyms of *Diospyros* (Ebenaceae) from Mexico. – Stapfia 103: 111–113.
- WALLNÖFER B. & CHÁVEZ E., 2014: Ebenaceae. – In: JØRGENSEN P.M., NEE M.H. & BECK S.G., (eds.): Catálogo de las plantas vasculares de Bolivia. – Monographs in Systematic Botany from the Missouri Botanical Garden 127 (1): 572–574.
- WALLNÖFER B. & MORI S.A., 2002: Ebenaceae. – In: MORI S.A., CREMERS G., GRACIE C.A., GRANVILLE J.-J. DE, HEALD S.V., HOFF M. & MITCHELL J.D., (eds.): Guide to the vascular plants of central French Guiana, 2: Dicotyledons. – Memoires of the New York Botanical Garden 76 (2): 254–257, pl. 50–51.

Used websites (accessed 2022)

- Field Guides: <https://fieldguides.fieldmuseum.org/guides/>
- Google: <https://www.google.at/>
- Google Earth Pro: <https://www.google.at/earth/download/>
- Google Scholar: <https://scholar.google.at/>
- Herbarium NY: <http://sweetgum.nybg.org/science/vh/>

REFLORA: <http://reflora.jbrj.gov.br/reflora/PrincipalUC/PrincipalUC.do>

SpeciesLink: <https://specieslink.net/>

THIERS B., 2022 (continuously updated): Index Herbariorum: A global directory of public herbaria and associated staff. – New York Botanical Garden's Virtual Herbarium. <http://sweetgum.nybg.org/science/ih/>