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A revision of neotropical *Diospyros* (Ebenaceae): part 8

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Abstract

In the course of a revision of New World Ebenaceae for "Flora Neotropica" and some regional floras, specimens from ca. 100 herbaria have been studied. The South American and Antillean *Diospyros inconstans* Jacq. is here subdivided into five subspecies (*inconstans*, *darienk* subsp.n., *delgadoi*, *obovata*, and *psidioides*) which are described in detail. A neotype for *D. inconstans*, and lectotypes for *Annona imbitibana* Glaz., *D.* conduplicata Kunth, *D. psidioides* Kunth, *D. velutina* Hiern, *Maba inconstans* var. *granatensis* Hiern, and *Macreightia obovata* Mart. ex Miq. are here selected. The names *Annona imbitibana* Glaz., *D. acreana* Cavalcante, *D. anzoateguiensis* Steyerm., *D. berteroi* ("*berterii*") A.DC., *D. boliviana* Rusby, *D.* conduplicata Kunth, *D. velutina* Hiern, *Maba inconstans* var. *granatensis* Hiern, and *Macreightia pavonii* A.DC. are relegated into synonymy. The chromosome number 2n = 30 is reported for *D. inconstans* subsp. *psidioides*, *D. yatesiana* Standl. ex Lundell and *D. texana* Scheele. Figures, distribution maps, vernacular names, information on habitat and ecology, and lists of specimens are included.

Key words: Ebenaceae, *Diospyros inconstans* subsp. *inconstans*, subsp. *darienk*, subsp. *delgadoi*, subsp. *obovata*, subsp. *psidioides*, *D. acreana*, *D. anzoateguiensis*, *D. berteroi* ("*berterii*"), *D. boliviana*, *D. conduplicata*, *D. delgadoi*, *D. pavonii*, *D. psidioides*, *D. velutina*, *D. texana*, *D. yatesiana*, *Maba inconstans* var. *granatensis*, *Macreightia obovata*, *M. pavonii*, *Annona imbitibana*, revision, taxonomy, distribution maps, chromosome count, flora South American, Antilles.

Zusammenfassung

Im Rahmen einer Revision der neuweltlichen Ebenaceae für "Flora Neotropica" und einige Regionalfloren konnten Herbarbelege aus ca. 100 Herbarien studiert werden. Die südamerikanische und antillische Art *Diospyros inconstans* Jacq. wird hier in fünf Unterarten unterteilt (*inconstans*, *darienk* subsp.n., *delgadoi*, *obovata* und *psidioides*) und eingehend beschrieben. Ein Neotypus für *D. inconstans* und Lectotypen für *Annona imbitibana* Glaz., *D. conduplicata* Kunth, *D. psidioides* Kunth, *D. velutina* Hiern, *Maba inconstans* var. *granatensis* Hiern und *Macreightia obovata* Mart. ex Miq. werden hier ausgewählt. Die Namen *Annona imbitibana* Glaz., *D. acreana* Cavalcante, *D. anzoateguiensis* Steyerm., *D. berteroi* ("*berterii*") A.DC., *D. boliviana* Rusby, *D. conduplicata* Kunth, *D. velutina* Hiern, *Maba inconstans* var. *granatensis* Hiern und *Macreightia pavonii* A.DC. werden in die Synonymie gestellt. Die Chromosomenzahl 2n = 30 wird für *D. inconstans* subsp. *psidioides*, *D. yatesiana* Standl. ex Lundell und *D. texana* Scheele genannt. Abbildungen, Verbreitungskarten, Volksnamen, Angaben zum Habitat und zur Ökologie, sowie Listen der gesehenen Herbarbelege werden ebenfalls präsentiert.

Introduction

In the Americas, the Ebenaceae are represented by the genera *Diospyros*, with about 100–130 species, and *Lissocarpa* with eight species. In the course of an ongoing revision of Ebenaceae (Wallnöfer 2001a, 2001b, 2004a, 2004b, 2004c, 2006, 2007, 2008a, 2008b, 2009a, 2009b, 2010a, 2010b, 2010c, 2010d, 2011, 2012a, 2012b, 2013, 2014, Wallnöfer & Mori 2002, Estrada & Wallnöfer 2007; see also Duangjai et al. 2006,

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2009) for "Flora Neotropica", "Flora of Ecuador", "Flora of the Guianas", and "Flora de Paraguay" several new species have already been described (Wallnöfer 1999, 2000, 2003, 2005).

Note: Additions are given in brackets; coordinates given in brackets were determined during this revision; acronyms of herbaria according to Thiers (2014); data from herbarium labels are cited here in a standardized way; – 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 inconstans* Jacq.**, Enum. syst. pl.: 34 (1760) [nomen subnudum], emend. Jacq., Select. stirp. amer. hist. 276, tab. 174, fig. 67 (1763).

≡ *Macreightia inconstans* (Jacq.) A.DC., Prodr. 8: 221–222 (1844).
≡ *Maba inconstans* (Jacq.) Griseb., Fl. Brit. W. I. 404 (1861).
≡ *Ebenus inconstans* (Jacq.) Kuntze, Revis. Gen. Pl. 2: 408 (1891), nom. illeg.

Protologue: "floribus monoecis" + symbol for woody. – Jacquin (1763: 276) adds: "Habitat Carthagenae passim in fruticosis & sylvaticis maritimis. Floret imprimis Augusto & Septembri".

Note: No original specimens could be located (compare also D'Arcy 1970). Jacquin (1763: 276, tab. 174, fig. 67) shows a young fruit. Unfortunately, only few specimens with young fruits from northern Colombia were available for selection of a neotype.

Neotypus: Colombia, Atlántico, Costa del Caribe, espinares de Sabanilla, [11°1' N, 74°54' W], en lomas bajas arenosas cerca de la orilla del mar, (fr), 26 Jul. 1959, **A. Dugand 5167** [neotype: W (here designated; Fig. 1), isoneotypes: COL, US], "arbusto erecto 3 m; ramas ascendentes, duras de cortar; follaje lustroso; frutos globosos 15 mm diam., casi caulinares, con 3 o 4 sépalos persistentes en la base" – vernacular name: "limoncillo" and "limpiadiente".

= *Diospyros berteroi* ("*berterii*") A.DC., Prodr. 8: 234 (1844).

Typus: Colombia, Magdalena, Santa Marta [G-DC: "*Diospyros obtusifolia*, S. Martha, h. Bert. Mr. Balb. 1822"; – TO: "e S. Martha, 1821; Herb. Balbis"], [ca. 11°15' N, 74°10' W], (fr), 1821, **C.L.G. Bertero s.n.** [holotype: G-DC, isotypes: MO, TO n.s. (dig. photo), W].

Note: The leaves look somehow unusual and one calyx in the capsule of the holotype is 4-merous. I received through the courtesy of L. Guglielmone and G. Forneris digital photos and photocopies of some specimens kept in the herbarium of Torino (TO) which were collected by Bertero. There is obviously some confusion among these specimens. There are two specimens which bear the name *D. berterii*: the first bears two labels with the writings "*Bottionea racemosa* Bert.; *Diospyros obovata* W.?; S. Domingo 1819" [from Bertero's hand] and "*D. berterii* Spr." + illegible writings [from Balbis hand]. The second specimen belonged to the herbarium of Balbis and displays a label with the following information: "*Diospyros berterii* Spr. in lit.; ex S. Domingo, D. Bertero" [from Balbis hand]. Vignolo-Lutati (1955: 85) cites for

Fig. 1: Neotype of *Diospyros inconstans* JACQ. [W].

D. berterii only the latter specimen. Both specimens belong, however, in my opinion to *Stegnosperma cubense* (Phytolaccaceae / Stegnospermaceae). The true isotype of *D. berterii* bears not that name but the one "*Diospyros obtusifolia* W.". – An itinerary of Bertero's travel to America is presented in PISTARINO et al. (1989).

= *Diospyros anzoateguiensis* STEYERM., Fieldiana, Bot. 28 (3): 489–490 (1953).

Typus: Venezuela, Anzoátegui, between Bergantín and San José, 300–400 m, [10°1' N, 64°22' W], (fr), 16 Mar. 1945, **J.A. Steyermark 61513** [holotype: F (photo F 52498; photo NY: N.S. 6884 at FHO), isotypes: NY, US (neg. W: 2099)], "shrub 15 ft. tall; leaves subcoriaceous, olive green above, pale green below; calyx lobes reflexed; fruit subglobose 1.5 cm in diameter broad, 1.3 cm high, russet-greenish".

= *Maba inconstans* (JACQ.) GRISEB. var. *granatensis* HIERN, Trans. Cambridge Philos. Soc. 12 (1): 128 (1873).

Typus: Colombia, Magdalena, Sa. Martha [= Santa Marta], [ca. 11°15' N, 74°10' W], (fl male), 1845, **W. Purdie s.n.** [lectotype (here designated): K (no. 61064), isolectotype: E].

Note: HIERN (1873) did not clearly indicate the type of this variety. The above mentioned collection is the only one among the specimens cited for *M. inconstans* which displays ± oblong leaves and is, thus, in accordance with the protologue.

– "*Diospyros obtusifolia* BERTERO", Prodr. 8: 234 (1844), in syn., nom. inval.

General notes

Diospyros inconstans s.lat. occurs predominantly in seasonally dry tropical forests, whose distribution is delineated in PRADO & GIBBS (1993), GENTRY (1995), PRADO (2000), PENNINGTON et al. (2000, 2004), and BRIDGEWATER et al. (2003). The distribution pattern especially of the subspecies *psidioides* and *obovata* fits quite well into the so called "Residual Pleistocenic Seasonal Formations Arc" or abbreviated "Pleistocenic Arc" (PRADO & GIBBS 1993, PRADO 2000). The latter created a new phytogeographic unit, namely the "Tropical Seasonal Forests Region", to highlight this vegetation type. At least the populations in the rain forests of central and southeastern Peru (Huánuco, Madre de Dios), western Brazil (Acre and adjacent areas in Rondônia) and in northern Bolivia (Pando) seem to be remnants (components) of ancient dryer forests which may have grown in the area.

The flowers are chiefly 3-merous. The calyx of the male flower is narrowly cup-shaped and has a relatively long tube. The calyx lobes of subsp. *inconstans* are regularly accrescent on fruits and become, thus, usually longer than wide. In subsp. *delgadoi* the lobes are slightly wider than long and ± semicircular. In subsp. *darienk* and in many populations of subsp. *obovata* and *psidioides*, however, the expansion of the calyx lobes is irregular: the lateral parts of the lobes are growing and expanding much more than the median (central) part. The lobes become, thus, usually much wider than long and are finally often emarginate or sometimes even bilobed.

Diospyros inconstans s.lat. is highly variable (as is for example also the case with the species *Homo sapiens*) and the allocation of some specimens to the here proposed subspecies is often difficult. Only one chromosome count has been carried out to date (see

below under subsp. *psidioides*). Further counts are necessary to check if any changes in ploidy level may also have occurred.

PARMENTIER (1892) studied the anatomy of leaves and stems of "*D. inconstans*" and "*D. velutina*". As he did not cite any vouchers, it is not known which subspecies he examined.

Key to subspecies

1 Calyx lobes on female flowers acute, as long or longer than wide, on fruits acute, longer than wide and strongly flexed downwards; – northern Colombia, Venezuela, Tobago, Lesser Antilles (Windward Islands) ..... subsp. *inconstans*

1* Calyx lobes on female flowers semicircular, semielliptical or ± truncate, wider than long, on fruits much wider than long, ± semicircular, markedly emarginate or bilobed, apposed, spreading or flexed downwards 2

2 Mature leaves with markedly reticulate venation adaxially, frequently markedly obovate (less frequently elliptic or lanceolate); – from northeastern Brazil to Uruguay, eastern Paraguay and northeastern Argentina ..... subsp. *obovata*

2* Mature leaves (at least on fruiting specimens) not markedly reticulate adaxially (sometimes ± markedly reticulate on subsp. *darienk* but leaves then usually large, ± elliptic, 10–21 cm long and 4–8.5 cm wide), rarely markedly obovate 3

3 Leaves usually with strongly tortuous or at least arched hairs abaxially; secondary veins and their surroundings usually ± sunken and forming grooves on the adaxial leaf surface; calyx lobes ± semicircular or with an obtuse or sometimes acute apex, usually ± strongly flexed downwards or spreading on fruits; – Venezuela ..... subsp. *delgadoi*

3* Leaves with ± flexuose or straight hairs abaxially; leaf lamina usually flat adaxially; calyx lobes usually emarginate or bilobed and ± apposed to the fruits 4

4 Leaves ± markedly discolorous (often ± cinnamon- or sometimes chestnut-colored abaxially) when dry, usually large, 10–21 cm long and 4–8.5 cm wide; – eastern Panama (Darién) and northwestern border of Colombia (Antioquia) ..... subsp. *darienk*

4* Leaves not markedly discolorous when dry, usually smaller, 5–15 (–17) cm long and 2.5–6 (–7.4) cm wide; – Colombia (Tolima), Ecuador, Peru, Bolivia, western Brazil (Acre, Rondônia, Mato Grosso), and northeastern Brazil (Pará, Maranhão, Tocantins) ..... subsp. *psidioides*

Diospyros inconstans* JACQ. subsp. *inconstans – [Figs. 1–3, 6].

Typus (and synonyms): see above.

Treelet or tree up to 7 (–17) m tall (already flowering when 2 m tall), deciduous or tardily deciduous ("evergreen" according to CHEESMAN 1947); bark black (Andrews 3-34), gray (Romero Castañeda 546) or grayish-white (Flores et al. 233); **indumentum** consisting of simple, appressed, spreading or ± patent, straight or ± flexuose, light (sometimes ochre when alive, Romero Castañeda 546) hairs of varying length; twig apices and buds densely covered with ± appressed or slightly spreading hairs; young twigs subterete, scattered, medium densely or densely covered with appressed, spreading or ± patent

Fig. 2: *Diospyros inconstans* subsp. *inconstans* (a–c): a: male flowers (from Haught 3713 [NY]); – b: female flowers (from Rojas 1607 [U]); – c: fruits (from Howard 10716 [GH]); — subsp. *darienk* (d–f): d: male flowers (from Stern et al. 763 [upper three: LE, two on bottom: US]); – e: female flowers (from Croat & Porter 15467 [MO]); – f: fruits (from Gentry 13458 [NY, holotype]); — subsp. *delgadoi* (g–i): g: male flowers (from Flora Falcón 84 [FHO]); – h: female flowers (from Wingfield 7467 [FHO]); – i: fruits (from Wingfield & López 7597 [FHO]); – scale = 1 cm.

regular hairs and sometimes also with minute, translucent, patent hairs, glabrescent, sometimes markedly lenticellate; **leaves** alternate, with brochidodrome venation; petioles 3–5 (–7) mm long, 1–2 mm thick, ± canaliculate or nearly flat adaxially, medium densely covered with appressed or slightly spreading hairs, later glabrescent especially abaxially, slightly winged in the distal part; leaf lamina broadly lanceolate, elliptic or obovate, (1.4–) 4.5–13 (–16) cm long, (1–) 2–6 (–7.5) cm wide, 1.5–2.7 times longer than wide, widest in or above the middle, firmly chartaceous or sometimes ± subcoriaceous, with ± scattered, ± appressed, straight hairs on both sides especially when young, ± glabrescent when mature, dark green and shiny adaxially, pale green abaxially when alive, usually dull on both sides, rarely slightly glossy adaxially when dry; leaf apex obtuse or acute, less frequently rounded, rarely slightly acuminate or retuse; base of the lamina cuneate to obtuse, sometimes rounded or attenuate; leaf margins entire, ± revolute especially proximally; flachnectaria up to ca. 10 on abaxial leaf surface, usually arranged near base, rarely in the middle or towards the apex, rarely missing on some leaves, circular or ± elliptic; midvein on adaxial side slightly to deeply sunken (canaliculate) or rarely ± flat in the proximal ⅔, ± flat towards the apex, ± medium densely covered with spreading to patent hairs, glabrescent on old leaves, on abaxial side markedly prominent and with ± appressed, scattered hairs; secondary veins 7–10 per side, slightly raised adaxially (but rarely together with their surroundings at least partially ± sunken and forming grooves on the adaxial leaf surface), prominent abaxially, soon glabrescent on both sides; intersecondary veins inconspicuous; tertiary to quinternary veins usually ± raised and markedly reticulate on both sides of dry leaves, but on adaxial side of mature or older leaves of some populations (e.g., Steyermark 61513, the type of *D. anzoateguiensis*) hardly or not visible; **inflorescences** arranged at the base or along the proximal part of new shoots in the axil of leaves (the lowermost ones often in the axil of very small leaves or sometimes in the axil of caducous bracts); male inflorescence units 1.5–2 cm long, consisting of a simple or compound, 3–7 (–9)-flowered, medium to densely hairy cyme; peduncles 2–5 (–8) mm long, 0.8 mm thick; pedicels of the lateral flowers ca. 1.5 mm long; female cymes 1 (–2)-flowered (Fig. 2b); stalk (peduncle and pedicel) 4–8 mm long, 0.5–1 mm thick (enlarged distally), densely hairy; bracteoles of male and female flowers (1–) 2–4 (–6) mm long, 1–1.5 mm wide, lanceolate, ± acute, hairy abaxially, glabrous adaxially, soon caducous, frequently attached at the base of the female flowers; **flowers** 3 (rarely 4)-merous; male flowers (Fig. 2a) 7–12 mm long at anthesis (pedicels excluded), pendant (Haught 3713); calyx 5–7 mm long and 5–8 mm wide, undivided in the proximal 2–3 mm, on the outside medium densely to densely covered with short, thin, ± appressed, ± straight hairs, green when alive; undivided part of the calyx narrowly cup-shaped, inside glabrous or (on Haught 3713, Philcox & Raynal 7920) densely covered with appressed, straight hairs except near base; calyx lobes 3–5 mm long and wide, ± semielliptical or broadly triangular, ± acute, widest in the proximal third, with flat or sometimes slightly involute margins, sometimes imbricate (Haught 3713, Philcox & Raynal 7920), ± densely covered with ± spreading hairs adaxially, ± scattered hairy abaxially, with a tuft of hairs distally; proximal part of the lobes adaxially without or with (e.g., Philcox & Raynal 7920) a small gable-like, raised, scattered or densely hairy step; sinuses between the lobes inconspicuous; corolla green (Sandwith 1632, Williams 11670), greenish yellow (Baker 15273), pale yellow (Haught 3713) or yellow (Steyermark 112184, Romero Castañeda 9856) when alive, 7–10 mm long; tube 7–8 mm long, widest in or below the middle and there 2–2.5 mm wide,

tapering distally, densely covered with long, thick, ± appressed, straight or slightly flexuose, light hairs (intermixed with smaller ones) on the outside, glabrous near base and inside; throat constricted, ca. 0.5 mm wide; corolla lobes 3.5–5 mm long and 2.5–3 mm wide, ± elliptic or lanceolate, acute or obtuse, on abaxial side densely covered with shorter hairs along the keel, scattered hairy or ± glabrous towards the margins, glabrous adaxially; stamens 9 (Engel s.n.), 10 (Haught 3713) or 12 (Curran & Haman 1324, Philcox & Raynal 7920), usually in pairs (the opposite stamens of the outer and inner whorl are fused proximally), strongly differing in length (the inner 1.5–3, the outer up to 4.5–5 mm long), glabrous (but in Haught 3713 and Philcox & Raynal 7920 with some appressed hairs on one side of the connectives), adnate to the corolla tube ca. 0.5 mm above or near its base; filaments 0.3–2.5 mm long and ca. 0.2 mm wide, yellow (Romero Castañeda 546) when alive; anthers (1–) 2–3 mm long and ca. 0.4–0.8 mm wide, widest near their base, tapering into an up to 0.8 mm long conical connective appendage distally; rudiment of the ovary consisting of an irregular, densely hairy lump of tissue lacking stylodia; **female flowers** (Benitez de Rojas 1607, Fig. 2b) 6–7 mm long at anthesis (pedicels excluded; 10 mm long with erect petals); calyx 7–10 mm long and up to ca. 13 mm wide, undivided in the proximal 2–3 mm, green when alive, on the outside (including the lobes) scattered to medium densely covered with appressed to slightly spreading hairs; undivided part of the calyx cup-shaped, ± truncate at the base, inside ± densely covered with appressed hairs distally and ± glabrous proximally; calyx lobes 6–9 mm long, 5–6.5 mm wide, obtuse or acute, sometimes with conspicuous longitudinal veins, scattered to densely covered with appressed to spreading hairs adaxially; margins ± flat (involute when dry), not flexed outwards near base; proximal part of the lobes adaxially with a gable-like, raised, densely hairy step; area around the sinuses between the calyx lobes inconspicuous; corolla 7–9 mm long at anthesis, yellow (Benitez de Rojas 1607) when alive; tube 6 mm long, widest ± in the middle and there ca. 3 mm wide, densely covered with long, appressed or slightly spreading, straight or slightly flexuose hairs on the outside, glabrous near base and inside; throat constricted, 0.5–1 mm wide; corolla lobes 2–2.5 mm long, 1.5–2 mm wide at the base, ± triangular, acute or obtuse, on abaxial side densely hairy along the keel, glabrous towards the margins, glabrous adaxially; staminodia 3 (only one anthetic flower of Benitez de Rojas 1607 dissected), antesepalous, 4 mm long, free except at base, adnate near the base of the corolla tube, glabrous; filaments 2.5 mm long and ca. 0.2 mm wide, yellow when alive (Romero Castaneda 1065); antherodes flat, ca. 1.5 mm long and 0.3 mm wide, narrowly lanceolate or triangular, tapering distally; ovary 3-carpellate, 6-locular, as a whole 4.5 mm long, ca. 3 mm in diameter, tapering into the ca. 2 mm long, conical style, green when alive, densely covered with appressed, ± straight hairs; stylodia 3, fused up to the apex, densely hairy; stigmata 3, deeply lobed; stalk of the **fruits** 2–4 mm long, ca. 1.5 mm thick (enlarged distally), densely covered with old hairs; fruits (Fig. 2c) up to 6-seeded, ± depressed globose, up to ca. 1.8 cm in diameter, green when immature, green turning orange (Howard 10716), russet-greenish (Steyermark 61513), yellow (Worthington & Jack 17752, Kalloo B.576), yellow-orange (Howard 10433), or when mature and alive blackish (Fernández et al. 197), ± brown when dry, smooth and with tightly adhering epidermis when dry, covered with a medium dense, ± appressed indumentum, glabrescent except at the apex when mature, detaching with the calyx; fruit wall ca. ¼ mm thick when dry; calyx on fruits as a whole 1–1.5 cm wide and up to ca. 1 cm long (including the reflexed lobes), covered with remnants of the indumentum (see female flowers) or ± glabrescent; area around the

sinuses between the calyx lobes inconspicuous; undivided (basal) part of the calyx 6–8 mm wide, plate- or dish-shaped, without longitudinal ridges running down from the sinuses abaxially, displaying inside a raised, ± triangular platform with ± rounded corners and convex edges (derived from the gable-like, raised structure in female flowers; – see WALLNÖFER 2014: Fig. 10e) which is tightly appressed to the fruit and ± densely covered with centrifugally arranged, appressed, straight hairs; lobes 7–10 mm long and 6–7 mm wide, triangular, ± flat or slightly (sometimes strongly) involute, with raised longitudinal veins especially abaxially, flexed downwards (usually positioned ± parallel to the pedicel for their whole length on mature fruits); seeds bean-shaped, ca. 11 mm long, 6–7 mm wide, 3–4 mm thick, dark brown when dry; endosperm not ruminate.

Notes: A collection from Sucre in Colombia (Romero Castañeda 9856) displays on the same flowering twigs old and new leaves. It is not clear whether this population is semi-deciduous or even evergreen. According to CHEESMAN (1947), the species is evergreen in Trinidad & Tobago, but this needs confirmation. None of the herbarium specimens from that country show old and new leaves on the same twig.

In western Venezuela, where subsp. *delgadoi* occurs, no typical collections of subsp. *inconstans* have been collected so far. Some collections from that area are, however, atypical and cannot be assigned to one of the two subspecies. They differ from typical subsp. *inconstans* in having a denser indumentum on young twigs, petioles, leaves, and calyces. The hairs on abaxial leaf surfaces are ± spreading or patent, straight, flexuose or sometimes arched but never strongly tortuous (as is the case in subsp. *delgadoi*). The calyx lobes on fruits are ± intermediate between the two subspecies. They differ from typical subsp. *delgadoi* also in having ± reticulate and slightly raised tertiary and quaternary veins on adaxial leaf surfaces. At least some of these specimens could represent stabilized hybrids. These specimens are listed separately further down.

Figures: female flower, fruit and seed (JACQUIN 1763: tab. 174, fig. 67; JACQUIN 1780–1781: tab. 263, fig. 87; a reprint of the latter in MADRIÑÁN 2013: plate 383); branch with fruits (HOWARD 1989: fig. 31, same figure in FOURNET 2002: fig. 72.1; ESTRADA & WALLNÖFER 2007: fig. 115-b).

Distribution: In Colombia it was collected in the departments of Atlántico, César, Magdalena, and Sucre; in Venezuela in the eastern federal states of Anzoátegui, Bolívar, Delta Amacuro, Dependencias Federales, Guyana, Nueva Esparta, and Sucre, (Figs. 3, 6). In Trinidad & Tobago it is known from the former counties San Fernando, St. Andrew, St. David, St. George, St. Patrick, and Tobago. It occurs furthermore in Grenada. According to HOWARD (1989), in the Lesser Antilles it is "currently known only from the Isle of Ronde, Tobago Cays, and Bequia in the Grenadines", where it is common especially on the north island of the Tobago Cays (Howard 11031). – C.P. Bélanger (986) collected it in 1854 in Martinique in the Mornes (hills) NE Saint-Pierre, an area which was devastated during the violent volcanic eruption of the Mount Pelée in 1902. The population of *D. inconstans* most likely perished there during this event. FOURNET (2002) was obviously unaware of Bélanger's collection and suspected that the species was probably only cultivated in Martinique. He pointed out that it had not been recollected on the island in recent times. According to him, it may have been indicated by error for Guadeloupe. – *D. inconstans* s.str. occurs from sea level up to elevations of 300–400 meters.

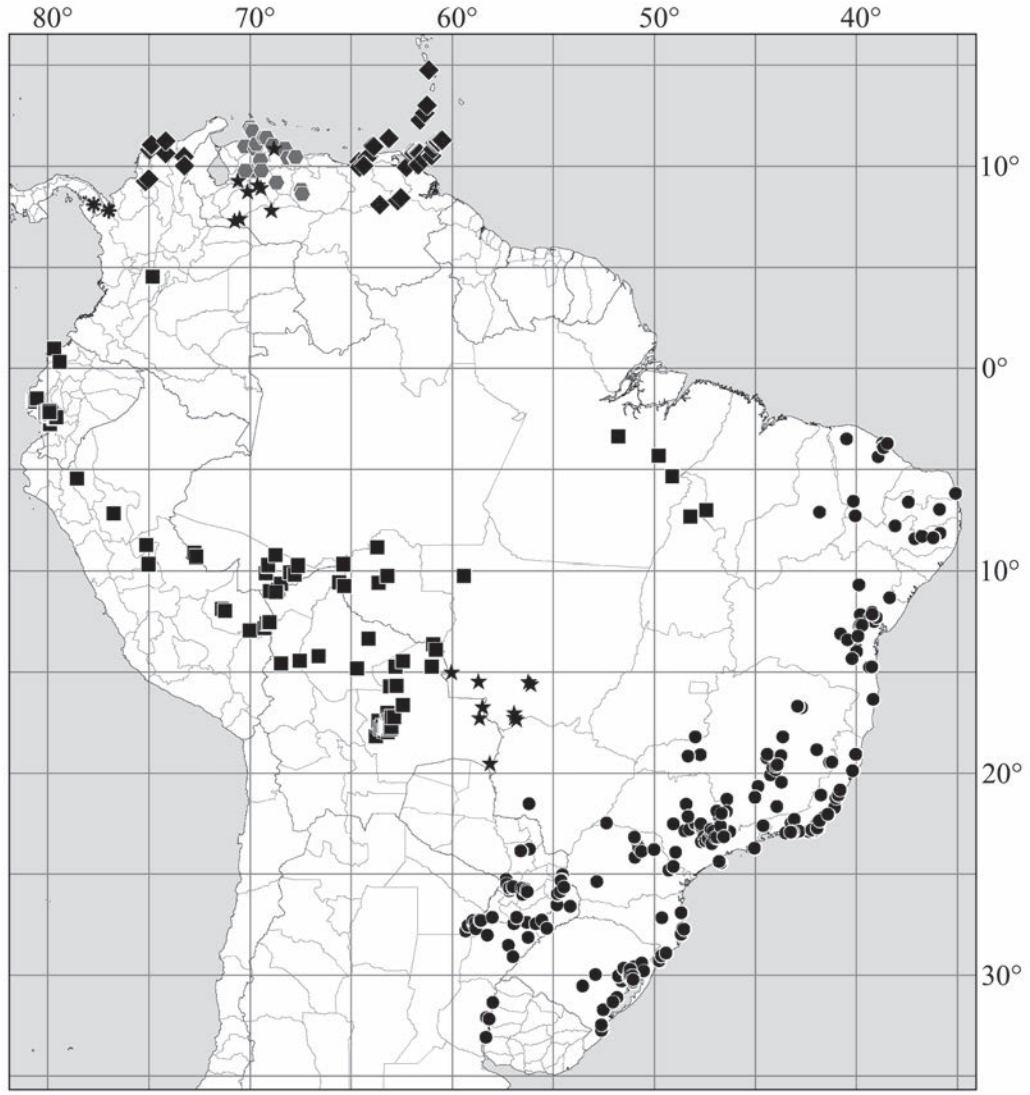

Fig. 3: Distribution of *Diospyros inconstans* in South America: subsp. *inconstans* (◆), subsp. *darienk* (✱), subsp. *delgadoi* (⬣), subsp. *obovata* (●), subsp. *psidioides* (■), intermediate populations (★).

Phenology: In Colombia it was collected in flower in April, July, September, and in October; in Venezuela in June, July, and in September; in Trinidad & Tobago and the Lesser Antilles in (May), June, July, August, and in October. In Colombia it was found in fruit in February, July, November, and in December; in Venezuela from September to April; and in Trinidad & Tobago and the Lesser Antilles from October to May, and in August.

Habitat: In the Colombian department Atlántico it grows along the coast on sandy places (on coralliferous limestone) in a subxerophitic, predominantly thorny and open

vegetation ("espinares") rich on cacti and with scattered groups of 3–6 m tall trees with wide crowns (Dugand 5167, 6063, 6683). In the department César it was collected along a water course (Haught 3713). – In eastern Venezuela it grows in deciduous forests along the coast (Ruiz et al. 4197), on cliffs (Broadway 60), on wet places near rivers (Hoyos & Ortega 4372), at the border of salt lakes (Steyermark & Agostini 91289), and was locally reported to be frequent and invasive in the forest understory (Aristeguieta & Zabala 7022). – In Trinidad & Tobago it was collected in deciduous forests and thickets (Cowan 1108: "xerophytic wood") especially along the coast, often on cliffs, but once also in a mangrove thicket (Adams 14318). – On the island of Grenada it was reported from a windswept area (Howard 10716) and on the islands of St. Vincent & The Grenadines it was found on hillsides and ridges, in scrubby growth and in thickets (Dalton B.152, B.451).

Vernacular names: in **Colombia**: "limoncillo", "limpiadiente" (Dugand 196, 5167, 6063, 6683, Romero Castañeda 9787); in eastern **Venezuela**: "cafetillo" (Fernández 300), "sierrito negro" (Aristeguieta 5837, SOTHERS & BERRY 1998, ESTRADA & WALLNÖFER 2007); "trompillo" (Fernández et al. 197); in **Trinidad & Tobago**: "butterwood" (CHEESMAN 1947), "clean teeth" (Beard 49, Broadway 4041, Eggers 5550, Worthington & Jack 17752).

The names given on the labels of some intermediate specimens (see the note above) from western **Venezuela** are "caimito" (Veillon 143), "camburillo" (Ruiz Terán 659), "guacharaco" (Veillon 145), and "ya-ya" (Bernardi 1085). The later was indicated with a question mark on the label. – It is unclear whether or not the vernacular names "quende", "morado" and "tanané", which are used in Colombia (CORTÉS 1897, PEREZ-ARBELAEZ 1956), may apply to *D. inconstans*.

Use: The twigs are used for cleaning teeth by the natives (e.g., Andrews 3-34). The fruits are edible (Fernández et al. 197, Engel s.n., BRÜCHER 1989).

Specimens examined: **Colombia**, Atlántico, Costa del Caribe, litoral de Sabanilla, 5–15 m, [11°3' N, 74°55' W], espinares en el litoral; fruticetum subxerofitico predominantemente espinoso, con cactáceas numerosas y árboles relativamente escasos y achaparrados (3 a 5 o 6 m alt.), en grupos aislados, cumulares; suelo en gran parte escueto, de arena profunda sobre caliza coralífera, (fr), 27 Feb. 1962, **A. Dugand 6063** [US], "arbolito fruticoso 2–3 m; hojas lustrosas; tallos y ramificaciones erguidas"; – same locality: (fr), 11 Feb. 1964, **A. Dugand 6683** [COL n.s. (dig. photo)], "arbusto erecto 2–2.5 m; tallos ascendentes casi verticales; follaje verde oscuro; frutos verdes"; – Sabanilla, Magdalena-Mündung, [11°4' N, 74°52' W], (fl male), s.d., **H. Karsten s.n.** [LE n.s., W]; – Sabanilla, [11°1' N, 74°54' W], (fl male), s.d., **F. Engel s.n.** [LE], "bacca edulis; essbare Beeren"; – "Santa Rosa" near Barranquilla, [ca. 10°49' N, 74°58' W], (fr), 16 Nov. 1932, **A. Dugand 196** [F, WIS (MAD) n.s.], "occasional shrub or small tree 3–4 m tall, 15–20 cm diam.". – Magdalena, Sta. Martha [Santa Marta], [ca. 11°15' N, 74°10' W], (fl male + female), 1845 (1846?), **J. Goudot s.n.** [G-BOIS, K]; – same area: (fl female), 1844, **J. Goudot 1** [P]; – same area: (fl male, yfr), 1844, **J. Goudot 2** [P]; – same area: near sea level, (fl male), Jul. 1898–1901, **H.H. Smith 451** [BM, F, G 2×, GH n.s., K, MICH, MO, NY, P 2×, PH, US]; – Tucurinca, 100–200 m, [ca. 10°39' N, 74°10' W], (fr), Dec. 1947, **R. Romero Castañeda 546** [COL 2× (+ 1 dig. photo), US], "arbusto 4 m, muy ramificado; ramas colgantes; corteza gris; las extremidades de las ramas presentan escamas de color ocráceo, pubesc. del mismo color; hojas de haz más verde que el envés, membranosas, simples, enteras, márgenes ligeramente onduladas, oblongo-obovadas, ápice triangular; es raro encontrarlas elíptico-oblongas, base sub-redondeada, obtusa o sub-aguda, más frecuentemente sub-aguda; nervio medio y primario, amarillos, salientes en el envés; pecíolo verde-amarillento, glabro, acanalado en la cara sup.; algunos pecíolos presentan escasísimos pelos marrones; el nervio medio y primarios del haz tienen algunos vellos; fruto globoso, verde, algo brillante, apéndice estigmático, algo velloso con vellosidad marrón; cáliz persistente, ovado, gamosépalo, vuelto hacia abajo, pubesc. en ambas caras, pubesc. negruzca; fruto con 6 semillas cubiertas por tegumento marrón,

cuándo se estrujan los frutos maduros manchan de amarillo; pedúnculo de 1 cm de long., color chocolate y con pubesc. del mismo color que la del cáliz; estípula [?] triangular, aguda en el ápice, color ocráceo tomentoso, axilar"; – Tucurinca, 100–200 m, [10°39' N, 74°10' W], (fl female), 24 Apr. 1948, **R. Romero Castañeda 1065** [COL], "2 brácteas infracal., opuestas, verdes, con los días toman color amarillo, angostamente obovato-oblongas, con ápice triangular y velloso; pedúnculo verde-pálido, velloso; cáliz ovado, verde, velloso; 3 pétalos de ápice obtuso o sub-redondeado; corola urceolada, la porción soldada es vellosa ext., la porción libre es triangular y solo tiene vellos en la mitad del envés; estilo velloso, verde, trilobado; filamentos amarillos; anteras oblongas con ápice muy agudo; ovario semi-ínfero, de 6–8 carpelos, verde". – César, "Hab. – Valle Dupar" [= Valledupar], [10°29' N, 73°15' W], (fl male), Jul. 1844, **illegible s.n.** [K], "singular shrub"; – near Codazzi, ca. 150 m, [ca. 10°2' N, 73°14' W], along water course, (fl male), 3 Oct. 1943, **O. Haught 3713** [COL n.s. (dig. photo), K, NY, S, UC, US], "small tree about 5 m high; flowers pale yellow, pendant, falling at a touch". – Sucre, Mpio. de San Pedro, entre Juan Arias y San Pedro, [ca. 9°22' N, 75°0' W], (flbuds male), 10 Sep. 1963, **R. Romero Castañeda 9856** [AAU, COL 2× (+ 1 dig. photo), MO], "arbolito de 5 m; cáliz verde; corola amarilla; frutos verdes"; – alrededores de Sincé, [9°15' N, 75°9' W], (st), 6 Sep. 1963, **R. Romero Castañeda 9787** [AAU, COL], "arbolito de 5 m"; – without further data: Prov. de Carthagena, (fl male), 1866, **J.J. Triana 2613** [BM, FI, G-DC, K, P, W].

Venezuela, Nueva Esparta, Isla de Margarita, El Espinal – La Guardia – San Juan Bautista – Fuentidueño, NE de la Isla, Distrito Díaz, 100 m, [11°1' N, 63°55' W], (fl female), 20 Sep. 1973, **C.E. Benitez de Rojas 1607** [MER n.s. (dig. photo), MY n.s., U, VEN n.s.], "arbusto ± 4 m; pétalos amarillos"; – en la Sierra a lo largo de la carretera Porlamar-La Asunción, [10°59' N, 63°52' W], (fr), 17 Nov. 1972, **A. Fernández 1576** [MY n.s. (bad photocopy + fragm. at W)], "arbusto"; – El Valle, [10°59' N, 63°52' W], crece en lugares húmedos cerca del río, (fr), 18 Feb. 1980, **J. Hoyos & F. Ortega 4372** [VEN n.s. (bad dig. photos)], "árbol 3–4 m; hojas elípticas u obovadas, de unos 7 cm de largo por 3 cm de ancho, obtusas en el ápice, atenuadas en la base; frutos verdosos". – Anzoátegui, Guanta, [10°14' N, 64°36' W], (flbuds female), 1 Jul. 1917, **H.M. Curran & M. Haman 1208** [NY, MO], "small tree"; – Fundo Lagunitas de Flores, cerca del Caserío de Curataquiche, Barcelona, [9°57' N, 64°35' W], muy abundante e invasor en el sotobosque, (fr), 28 Mar. 1969, **L. Aristeguieta & H. Zabala 7022** [F, MO, NY 2×, VEN n.s.], "árbol de unos 8 m". – Sucre, 1–2 km S of Playa San Luiz, 3 km S of Cumana on road to Puerto La Cruz, sea level, [10°25' N, 64°13' W], low lying, flat secondary forest on seaward side of road, (fr), 3 Mar. 1979, **T. Plowman 7807** [COL n.s. (dig. photo), F, MO, NY, U], "tree 8 m tall; fruits light green"; – Península de Paria, Ensenada de Patao, este de Puerto de Hierro, este de la boca del Río Patao, 10 m, [10°38' N, 62°4' W], orillas del lago de agua salada, (fl male), 24 Jul. 1962, **J.A. Steyermark & G. Agostini 91289** [K, MER n.s. (dig. photo), VEN n.s.], "tree 5 m; leaves subcoriaceous, rich green and shining above, paler green below; calyx 3–4 lobed, green; ovary green, subinferior"; – camino a Aricagua [Ensenada Aricagua] cerca de la costa, Cristóbal Colón [= Macuro], [10°40' N, 61°56' W], (fr), Apr. 1944, **F. Fernández 300** [VEN n.s. (dig. photo)], "arbusto 5–6 m"; – Dtto. Valdéz, entre Macuro y Aricagua, 15–75 m, [10°40' N, 61°56' W], en selva decidua, al borde de la selva, pero cerca de la costa marina, (yfr), 3 Sep. 1986, **T. Ruiz et al. 4197** [MY n.s. (bad photocopy)], "árbol ca. 5 m; hojas brillantes en el envés; frutos inmaduros"; – vicinity of Cristóbal Colón [= Macuro], [10°39' N, 61°56' W], cliffs, (fr), 5 Jan.–22 Feb. 1923, **W.E. Broadway 60** [GH, NY], "small tree"; – same area, date and collector: hill, (yfr), **409** [GH, NY, US]; – [Ensenada] Cariaquita, [10°41' N, 61°54' W], (fr), 16–21 Jan. 1911, **F.E. Bond et al. 29** [GH, K, PH]. – Guyana, Angostura ó ciudad Bolivar dans les Musichales [barely legible], [ca. 8°6' N, 63°34' W], (fl male), 1864, **R. de Grosourdy 13** [P]. – Bolívar, Parque Caroní [within Puerto Ordaz], [8°19' N, 62°44' W], cerca de rebalses, (fr), Sep. 1965, **L. Aristeguieta 5837** [MER n.s. (dig. photo), MY n.s., NY, VEN n.s.], "árbol 6 m, escaso"; – Parque Cachamay, along Río Caroni, near Puerto Ordaz, vicinity of estacionamiento, 50 m, [8°18' N, 62°42' W], (fl male), 20 Jun. 1976, **J.A. Steyermark 112184** [NY, VEN n.s.], "tree 8–10 m; leaves dark green; flowers 3-parted; corolla yellow". – Delta Amacuro, entre San Félix [in Ciudad Guayana] y Los Castillos, orillas del Río Orinoco, en las lomas del Castillo más alto, 50 m, [ca. 8°27' N, 62°32' W], (fr), 3 Dec. 1959, **L. Bernardi 7805** [MER n.s. (dig. photo), VEN 2× n.s. (dig. photos)], "arbolito; hojas verdes, brillantes; frutos redondos, con varias semillas"; – Pedernales, [ca. 9°58' N, 62°15' W], (flbuds male), 16 Jul. 1917, **H.M. Curran & M. Haman 1324** [GH, MO, NY, U]. – Dependencias Federales, Archipiélago Los Testigos, Isla Testigo Grande, lado N, 50 m, [11°23' N, 63°7' W], (fr), 20 Dec. 1982, **A. Fernández et al. 197** [GH, MO, NY], "árbol pequeño, 3–3,5 m; frutos verde claro, negruzcos cuando maduros"; – same island: path to the beacon (faro), ca. 60 m, (fr), 21 Dec. 1982, **J. Flores et al. 233** [FHO], "small tree ca. 3 m; bark greyish-white; leaves pale green, some yellowish; fruit pale green"; – Gulf of Paria, Patos island, [10°38' N, 61°52' W], (fr), 18 Apr. 1924, **R.O. Williams & A.A. Williams 10729** [K], "shrub 8–10 ft.".

Trinidad & Tobago, St. George, Chacachacare Island, [10°41' N, 61°45' W], (fr), 9–23 Feb. 1950, **R.A. Howard 10433** [A, BM], "tree of 20', common; ls. shiny; flowers green; fruit yellow-orange when mature"; – same island: 30 ft., near beach, (fr), 17 Feb. 1963, **M.B. Kalloo B.576** [NY], "small tree 15–20 ft.; fruits yellow when mature"; – same island: along road from Perruquier Bay toward lighthouse, 0–150 m, xerophytic forest; top of beach, (fr), 22 Mar. 1959, **R.S. Cowan 1108** [GH, NY, P, US], "tree to 2 m tall; occasional"; – Scotland Bay, [10°42' N, 61°40' W], by waterside on low cliff, (fl male), 4 Aug. 1976, **C.D. Adams 14096** [NY], "tree 30 ft."; – Teteron Bay, [10°41' N, 61°40' W], coastal bank, (fr), 11 Mar. 1920, **N.L. Britton 491** [GH n.s., NY, US], "tree 6 m"; – road to Tetron Bay [= Teteron Bay], [10°41' N, 61°40' W], on rocky cliffs, (fr), 8 Dec. 1931, **W.E. Broadway s.n.** [MO], "small tree"; – Stanble's to Tetron's Bay [= Teteron Bay], [10°41' N, 61°40' W], (flbuds male), 12 Jul. 1927, **R.O. Williams 11670** [K], "flowers green"; – Gasparee island [= Gaspar Grande], [10°40' N, 61°39' W], (fl male), 7 Oct. 1934, **W.E. Broadway 9424** [K 2×, MA n.s. (dig. photo), P, U], "small tree"; – Caledonia island, [10°39' N, 61°36' W], (fr), 11 May 1925, **R.O. Williams & E.E. Cheeseman 11044** [K 2×]. – St. David, Salybia, Toco, [10°50' N, 60°57' W], nr. seashore, (flbuds male), 26 Jun. 1983, **Y.S. Baksh & B. Stride YSB 979** [U 2×], "tree c. 15 ft.". – St. Andrew, Manzanilla, [10°31' N, 61°3' W], coastal woods, (fr), 9 Mar. 1921, **N.L. Britton & E.G. Britton 2182** [GH n.s., NY, US], "tree 7 m"; – Manzanilla Bay, [10°31' N, 61°1' W], on cliff, (fr), 22 Nov. 1977, **E.K. Ramcharan 345** [NY]. – San Fernando, San Fernando Hill, [10°22' N, 61°23' W], (fl male), 18 Jul. 1926, **W.E. Broadway 6370** [K], "small tree"; – same locality: the top, 500 ft., brush, (fr), 1 Feb. 1953, **R.E.D. Baker & N.W. Simmonds 14839** [K 2×, U], "small tree 5 m; fruits green". – St. Patrick, Erin Beach east, [10°4' N, 61°40' W], mangrove thicket, (fr), 20 Dec. 1977, **C.D. Adams 14318** [NY], "tree 20 ft."; – Trinidad ad Erin, [10°4' N, 61°40' W], (fr), Mar. 1908, **W.E. Broadway 2776** [Z]. – Trinidad Island: "Hort. Trinidad" [Trinidad Botanic Garden], (fr), 1882, **J.H. Hart s.n.** [M]; – same place: (fr), s.d., **J.H. Hart 4346** [MICH]; – Cascadoux trace [not traced], (defl male), 26 Aug. 1977, **E.K. Ramcharan 287** [CAS, NY]; – Union Bay [? barely legible; not traced], (fr), 7 Feb. 1889, **J.H. Hart 3503** [K]; – without further data: (fr), 1916, **W.E. Broadway s.n.** [F]; – (fl male), s.d., **s.coll. (probably J.H. Hart) 2118** [US]. – Tobago, St. Patrick Parish, Crown Point / Store Bay area, [11°8' N, 60°50' W], (fl female, fr), 13 Jul. 1989, **R.D. Worthington 18010** [MO, UTEP n.s.], "small tree"; – Store Bay, low altitude, [11°9' N, 60°50' W], (fl male), 10 Jul. 1954, **R.E.D. Baker 15273** [K], "tree 3 m; calyces 3, green; corolla 4 greenish yellow"; – Scarborough, [11°11' N, 60°44' W], sea cliff, (fl male), 9 Jul. 1954, **R.E.D. Baker 15270** [K], "calices green"; – Rockley Vale [= Rocky Vale], [11°11' N, 60°44' W], (fl male), 4 Jun. 1910, **W.E. Broadway 4041** [F, Z], "small tree"; – Bacolet, [11°10' N, 60°43' W], (fr), 12 Mar. 1963, **L.M. Andrews 3-34** [NY 2×], "tree with black bark"; – same locality: 600', in fruticetis humidis infrequens, (fr), Oct. 1889, **H.F.A. Eggers 5550** [K, P], "arbor 12'"; – same locality: 100 ft., cliffs above sea, (fr), 7 Aug. 1958, **J.W. Purseglove P.6213** [K, US], "small tree 20 ft.; fruits green"; – same locality: on dry wooded hillsides and in hedges by road, (flbuds male, yfr), 6 Oct. 1937, **N.Y. Sandwith 1632** [K 2×, NY], "small tree with green flowers and fruits; common"; – Green Hill District, along Hillsborough East River above the waterfall, ca. 500 ft., [11°11' N, 60°42' W], thickets, (flbuds male), 19 Aug. 1959, **G.L. Webster & K.I. Miller 9778** [DAV], "shrub 3 m high"; – Mount St. George, along Hillsborough East River, ca. 50 ft., [11°12' N, 60°41' W], thickets, (fr), 19 Aug. 1959, **G.L. Webster & K.I. Miller 9784** [DAV], "tree 5 m high"; – Hillsborough Road, ca. 600 ft., [11°13' N, 60°40' W], among rocks above waterfall, (fl male), 5 Jun. 1975, **D. Philcox & A. Raynal 7920** [K, W], "tree to 4 m; young buds with green calyx open showing base of corolla cream with lobes dull green"; – Pigeon Hill [Peak], [11°18' N, 60°33' W], (cultivated at the USDA Plant Introduction Station, Miami, Florida), (fr), 16 Mar. 1971, **W.T. Gillis 10366** [FHO, MO, RSA], "furrowed bark"; – St. John Parish, Little Tobago Island, [11°18' N, 60°30' W], (fr), 8 Jan. 1989, **R.D. Worthington & H. Jack 17752** [NY], "common 5 m tree; fruits yellow"; – same island: 300', soil igneous; topog. steep; deciduous forest, (fr), 3 Feb. 1942, **J.S. Beard 49** [F], "small tree"; – same island: Mockingbird Trail, 50–60 m, [11°18' N, 60°30' W], common in seasonal forest, (fr), 15 Aug. 1979, **G.L. Webster 24184** [DAV 2×], "shrub or tree ca. 3 m high; fruits green"; – without further data: (fr), 11 Nov. 1911, **W.E. Broadway s.n.** [MO].

Grenada: windward coast of the Isle of Ronde, [12°18' N, 61°35' W], windswept area, (fr), 7–25 Mar. 1950, **R.A. Howard 10716** [BM, GH, NY], "tree to 15'; fruit green turning orange".

St. Vincent & The Grenadines, Grenadines, Tobago Cays, [12°38' N, 61°21' W], "common on the north island", (fr), 26–31 Mar. + 8–20 Apr. 1950, **R.A. Howard 11031** [B, BM, GH, MICH, NY], "shrub to 9' tall; fruit green"; – Beequia [= Bequia] (Grenadine) island, B.W.I. [= British West Indies], 1000 ft. to sea-level, [13°1' N, 61°14' W], hillsides, forest, in thickets, (fl male), May 18??, **J. Dalton B.152** [K, NY], "tree to 50 ft."; – same locality: 500–1000 ft., hillsides and ridges, scrubby growth, (fl female, yfr), Jul. [without year],

J. Dalton B.451 [K], "tree to 55 ft."; – St. Vincent, [13°15' N, 61°12' W], (fl male), s.d., **L. Guilding s.n.** [GOET (fragm.), K 3×], (Howard 1989: "… was presumably obtained from a plant introduced from Bequia by Anderson and cultivated in the Botanic Garden").

Martinique: Mornes [hills] au Nord Est de St. Pierre [= Saint-Pierre], [ca. 14°46' N, 61°9' W], (fr), Apr. 1854, **C.P. Bélanger 986** [G, P]; – without data except for: (fr), 1860, **C.P. Bélanger s.n.** [P]; – same: (fr), 1857, **359** [P]; – same: (fr), 1859, **740** [P]; – same: (fr), s.d., **Plée 762** [P].

The following specimens from **western Venezuela** are atypical (see the note above): Municipio Jacura, Distrito Acosta, Cerro de la Mina, cerca de Riecito, 350–650 m, [10°53' N, 68°48' W], bosque submontano húmedo, (fl male), 27 Jul. 1961, **L. Ruiz Terán 659** [MER 2× n.s. (dig. photos), MO], "árbol inerme, 8–10 m × 25–30 cm; flores 3–4-meras, diploclamídeas, los lóbulos del cáliz verdes; corola con tubo más o menos urceolado, verdoso, y lóbulos amarillos; estambres insertos hacia la base del tubo de la corola, 9–10, algunos filamentos bifurcados; anteras oblongas u oblongo-lanceoladas, agudas; pistilodio densamente hirsuto"; – Portuguesa, Dtto. Guanare, Fundo "El Chaparral" 16 km N–E de Guanare, margen derecho del Río Portuguesa, 0–180 m, 9°4' N, 69°32' W, [9°4' N, 69°37' W], bosques secundarios, (fl male), 5 Jul. 1985, **G. Aymard & B. Stergios 3818** [US], "árbol ca. 3 m; flores amarillas-verdosas"; – Papelón (Guanarito), [8°56' N, 69°27' W], (fr), 21 Nov. 1972, **J.P. Veillon 143** [FHO, VEN n.s.]; – same data: (st), **145** [FHO, VEN n.s.]; – Dtto. Pedraza, 19 km pasando 5 km más allá del Caño Anarú, [ca. 7°25' N, 70°30' W], bajíos, transicional y banco, (fr), 22 Jan. 1978, **B. Trujillo et al. 14698** [F, MY n.s.], "arbolito de frutos sabor agridulce; cáliz trímero; fruto triseminado"; – Apure, Estación Biológica "El Frio", entre el Samán y el Mantecal, [ca. 7°50' N, 68°55' W], orla seca del bosque galería, (fr), Oct.–Nov. 1976, **S. Castroviejo & G. López 277** [MA], "árbol".

As the following specimens were not available, the indumentum could not be studied: Trujillo, Valle del Río Momboy, cerca de Mendoza [cited in Bono 2010 as: "cerca de Mendoza Fría"], ca. 1300 m, [ca. 9°18' N, 70°35' W], selva transicional, (fr), s.d., **G. Bono 87** [FT n.s. (dig. photo)], "árbol"; – Barinas, Distrito Obispos, unos 7 km al sur de la población de Barrancas, 170 m, [8°45' N, 70°6' W], bosque tropófito de Caimital, (fr), 14 Oct. 1961, **L. Ruiz Terán & L. Marcano Berti 757** [MER n.s. (dig. photo), MY n.s. (bad photocopy)], "árbol inerme, 6–8 m; copa inclinada, irregular; ramitas de penúltimo orden flexuosas, pardo-grisáceas; ramitas terminales alternas, dísticas, de color ferrugineo obscuro; frutos axilares, solitarios, globosos, 15 mm de diámetro, con 5–6 lóculos 1-spermos, subtendidos por el cáliz 3-mero"; on other label: "corteza negruzca; – Barinas/Apure, región de Guasdualito, bosques cerca de aserradero La Pastora, 5 km rum. norte, 180 m, [ca. 7°18' N, 70°44' W], bosques tropofitos; crecía en las orillas de sabana, (fr), 11 Feb. 1954, **Bernardi 1085** [K, MER 2× n.s. (dig. photos), VEN n.s.], "árbol 8 m, 15 cm diam.".

Diospyros inconstans Jacq. subsp. *darienk* B.Walln., subsp.n. – [Figs. 2–4, 6].

Typus: Panama, Darién, El Real, 1–3 km S of town, near sea level, [8°8' N, 77°43' W], disturbed forest and trailside, (fr), 7 Jan. 1975, **A.H. Gentry 13458** [holotype: NY (Figs. 2f, 4), isotypes: CTES, FHO, MO, NY, TEFH n.s.], "tree 5 m; fruits green".

Treelet or tree up to 20 m tall (already flowering when 4 m tall), apparently deciduous; wood soft (Duke & Bristan 324); **indumentum** consisting of simple, appressed or slightly spreading (on midvein patent), straight or ± flexuose, light hairs of varying length; twig apices and buds densely hairy; young twigs subterete, gray to light brown when dry, ± soon glabrescent; **leaves** alternate, with brochidodrome venation; petioles (6–) 8–10 mm long, 1.5–2 mm thick, often dark when dry, ± canaliculate, medium densely hairy, later glabrescent especially abaxially, slightly winged up to the base; leaf lamina ± elliptic, sometimes slightly obovate or oblong, (3.5–) 10–21 cm long, (2.6–) 4–8.5 cm wide, (1.5–) 2.3–3 times longer than wide, widest usually in or slightly above the middle, firmly chartaceous, often ± verrucose (due to subepidermal stone cell granules), glabrous adaxially, with scattered, ± appressed, straight hairs abaxially, dull on both sides, discolorous (± dark adaxially, often ± cinnamon- or sometimes

Fig. 4: Holotype of *Diospyros inconstans* JACQ. subsp. *darienk* B.WALLN. [NY].

chestnut-colored abaxially) when dry [for colors see Beentje & Williamson 2010]; leaf apex obtuse, acute, broadly rounded, or less frequently ± acuminate; base of the lamina rounded or abruptly cuneate; leaf margins entire, revolute especially proximally; flachnectaria up to 10 (–16) on abaxial leaf surface, usually near base but a few also below the apex (rarely some in the middle of the lamina), circular or irregularly elliptic; midvein on adaxial side deeply sunken (canaliculate) in the proximal ⅔, ± flat towards the apex, ± densely covered with patent, short hairs, on abaxial side markedly prominent and with ± appressed, scattered, longer hairs; secondary veins ca. 9 per side, flat or slightly prominent (but rarely together with their surroundings ± sunken and forming grooves on the adaxial leaf surface, e.g., in Duke & Bristan 324) and glabrous adaxially, prominent and scattered hairy abaxially; intersecondary veins inconspicuous; tertiary and quaternary veins either inconspicuous or ± reticulate and slightly raised adaxially, reticulate and ± raised abaxially; **inflorescences** arranged at the base or along the proximal part of new shoots in the axil of leaves (the lowermost ones often in the axil of very small leaves or sometimes in the axil of caducous bracts); male inflorescence units up to ca. 2 cm long, consisting of a simple, usually 3-flowered, densely hairy cyme; peduncles ca. 5 mm long, 1 mm thick; pedicels of the lateral flowers ca. 2 mm long, ca. 0.8 mm thick; female cymes 1-flowered (Fig. 2e); stalk (peduncle and pedicel) 5 mm long, 1–1.5 mm thick (enlarged distally), densely hairy; bracteoles of male and female flowers ca. 3 mm long, 1.5 mm wide, lanceolate, ± acute, hairy abaxially, glabrous adaxially, soon caducous; **flowers** 3 (rarely 4)-merous; male flowers (Fig. 2d) 13–14 mm long at anthesis (pedicels excluded; Stern et al. 763); calyx 8–9 mm long and ca. 7 mm wide, undivided in the proximal 4–4.5 mm, on the outside medium densely to densely covered with short, slightly spreading or appressed, ± flexuose hairs; undivided part of the calyx narrowly cup-shaped, glabrous inside (with some scattered hairs distally); calyx lobes 4–5.5 mm long and wide, semicircular to narrowly semielliptical, spreading (Stern et al. 763), obtuse or broadly rounded, usually with a small tip, widest in the middle, flat on margins, adaxially densely covered with spreading or patent hairs; sinuses between the lobes inconspicuous; corolla pale yellow (Stern et al. 455) or with tube cream colored and lobes yellow (Stern et al. 763) when alive, up to ca. 12 mm long; tube 10 mm long, widest below the middle and there ca. 2 mm wide, densely covered with long and short, ± appressed, ± straight, light hairs on the outside, glabrous near base and inside; throat constricted, less than 1 mm wide; corolla lobes 6 mm long and 4–5 mm wide, obtuse to ± acute, on abaxial side hairy along the keel and glabrous towards the margins, glabrous adaxially; stamens 9 (only one flower of Stern et al. 763 dissected), strongly differing in length, 3–5.5 mm long (the outer long and the inner ones short), usually solitary, glabrous, adnate to the corolla tube at its base or attached on the receptacle; filaments 0.5–2 mm long and ca. 0.2 mm wide; anthers 2.5–3.5 mm long and ca. 0.3 mm wide, widest near base, tapering into a ca. 0.8 mm long conical connective appendage distally; rudiment of the ovary completely missing; **female flowers** (Croat & Porter 15467 at MO, Fig. 2e) up to ca. 14 mm long in bud (pedicels excluded; anthetic flowers not available); calyx ca. 8 mm long and ca. 14 mm wide, undivided in the proximal 4 mm, on the outside (including the lobes) medium densely to densely covered with short, slightly spreading, ± flexuose hairs; undivided part of the calyx cup-shaped, inside densely hairy distally and glabrous near the base; calyx lobes 6 mm long, 12 mm wide, broadly rounded and slightly retuse (ending with a small tip of the midvein), but soon becoming ± emarginate, with ± involute margins, abaxially with ± raised longitudinal veins, adaxially

densely covered with spreading or patent hairs; proximal part of the lobes adaxially with a gable-like, raised, densely hairy step; area around the sinuses between the calyx lobes inconspicuous; corolla greenish-yellow when alive (Croat & Porter 15467), up to ca. 12 mm long in bud; tube ca. 6 mm long, ± cylindrical, 2–3 mm wide, densely covered with long and short, ± appressed, ± straight, light hairs on the outside, glabrous near base and inside; throat constricted, narrow; corolla lobes ca. 6 mm long in bud, on abaxial side hairy along the keel, glabrous towards the margins, glabrous adaxially; staminodia missing; ovary 3-carpellate, 6-locular, as a whole 6 mm long, 3 mm in diameter below the middle, tapering into the 3 mm long, conical style, densely covered with appressed hairs; stylodia 3, fused up to the apex, densely hairy; stigmata deeply lobed; stalk of the **fruits** ca. 8 mm long, 1.5–2 mm thick (enlarged distally); fruits (Fig. 2f) up to 6-seeded, ± depressed globose, up to ca. 3 cm in diameter, and 2 cm high, green when immature, "plum colored at maturity" (Croat & Porter 15467), red to reddish black (Gentry 4508 + photo at MO) or "al madurar morado [dark violet]" (Brand & Narvaez 705, Brand 1080) when alive, in the dry state light brown when immature and blackish when mature, smooth and with tightly adhering epidermis when dry, soon glabrescent except at the apex, detaching with the calyx; fruit wall ca. 0.3 mm thick when dry; calyx on fruits as a whole up to 2.4 cm wide and ca. 0.7 cm high, covered with indumentum (see female flowers), but sometimes partially glabrescent; area around the sinuses between the calyx lobes inconspicuous; undivided (basal) part of the calyx ca. 15 mm wide, plate-shaped, without longitudinal ridges running down from the sinuses abaxially, displaying inside a raised, triangular platform with convex edges (derived from the gable-like, raised structure in female flowers) which is tightly appressed to the fruit and densely covered with centrifugally arranged, appressed, ± straight hairs; lobes 8 mm long and 12 mm wide, usually ± emarginate and involute, with ± raised longitudinal veins abaxially, ± slightly apposed to the fruit; seeds ± bean-shaped or formed like the segments of an orange-fruit, 18–20 mm long, 8–9 mm wide, 5–7 mm thick, ± foveolate, dark when dry; endosperm not ruminate.

Note: The adaxial leaf surfaces of some collections (Brand 1080, Croat & Porter 15467, Stern et al. 455, 763) are verrucose and the tertiary and quaternary veins ± reticulate and slightly raised.

This taxon is briefly discussed in PROVANCE et al (2008) and is erroneously treated as "*D. digyna* JACQ." in ORTIZ (2011).

Figures: branch with leaves, female inflorescences, female flower buds, and fruits (WHITE 1978: 149, fig. 3).

Distribution, habitat and phenology: It is known only from a small area in Panama (Darién) and from nearby Colombia (northwestern part Antioquia), (Figs. 3, 6). It occurs most likely also in northern Chocó. Collectors reported it from swampy, disturbed forests, a creek bank, a trailside and from pasture margins. WHITEFOORD & KNAPP (2009) indicate it for the "selvas altas perennifolias". It was collected from sea level up to elevations of 20 meters, and was found in flower in March, June and July, and in fruit in January, March, April, July and November.

Vernacular names and use: unknown. The fruits are said to be edible (Croat & Porter 15467).

Specimens examined: **Panama**, Darién, El Real, [8°8' N, 77°43' W], (fr), 1 Mar. 1972, **A.H. Gentry 4508** [FHO, MO 2×, NY, PMA n.s. (dig. photo)], "small tree 4 m, branching from base; fruits reddish black". – same area and coordinates: near airport, swampy, disturbed forest, (fl female, fr), 13 Jul. 1971, **T.B. Croat & D.M. Porter 15467** [LL, MO, TEFH n.s.], "tree 6 m; flowers greenish-yellow; fruits plum colored at maturity, mostly 5-seeded, edible"; – same area: Quebrada Trapiche, (fr), s.d., **J.A. Duke & N. Bristan 324** [MO 2×, US], "small tree; soft wood; soft fruits"; – same area: Río Tuira, along creek bank, (fl male), 14 Jun. 1959, **W.L. Stern et al. 455** [G, GH, LE n.s., MO, UC], "tree 25 ft. tall; flowers pale yellow"; – same area and collectors: woodlands and pasture margins, (fl male), 1 Jul. 1959, **763** [G, GH n.s., LE, MO, US], "tree 25 ft. tall, 3 in. dbh; corolla tube cream colored, lobes yellow; calyx lobes 3, spreading"; wood US no.: 16447.

Colombia, Antioquia, Mun. de Turbo, carretera Tapón del Darién, sector Río León – Lomas Aisladas, km 40, Canal Tumaradó, 10 m, [7°50' N, 76°59' W], (fr), 30 Nov. 1983, **J. Brand & M. Narvaez 705** [HUA n.s. (dig. photo), JAUM n.s., MO], "árbol 5 m; fruto verde, al madurar morado"; – same area: km 37, 20 m, [7°50' N, 76°58' W], bosque primario, perturbado; suelo muy húmedo, (fr), 25 Apr. 1984, **J. Brand 1080** [COL n.s. (dig. photo), HUA n.s. (dig. photo), JAUM n.s., MO], "árbol 20 m; fruto verde, morado al madurar".

Diospyros inconstans Jacq. subsp. *delgadoi* (Standl.) B.Walln., comb.n. – [Figs. 2–3, 5–6].

≡ *Diospyros delgadoi* Standl., Publ. Field Mus. Nat. Hist., Bot. Ser. 22 (2): 97 (1940).

Typus: Venezuela, límite entre Lara y Trujillo, Trentina [= Trentino], [9°49' N, 70°13' W], (fr), Nov. 1937, **E. Delgado 96** [holotype: F (Fig. 5; photo F 52499; photo NY: N.S. 6883 at FHO), isotypes: G-DEL 2×, K, NY, US, VEN n.s.], "árbol frondoso; hojas cubiertas por debajo de un indumento ferrugineo".

Treelet or tree up to 7 m tall (already flowering when 2 m tall), strongly ramified (Sugden & Cardozo 738), usually deciduous, sometimes apparently tardily deciduous ("evergreen" according to Castillo 179); bark gray (Sugden & Cardozo 738), shallowly and finely fissured, black on transverse section (Breteler 4331); wood hard (Flora Falcón 689); **indumentum** consisting of simple, light brown, brownish or often ± ferruginous (on young leaves often also ± grayish), ± spreading or patent hairs of varying length; the shorter hairs ± strongly tortuous (on some collections only arcuate) and often ± felted, the longer ones slightly flexuose or ± straight; young twigs and buds densely tortuously hairy; **leaves** alternate, with brochidodrome venation; petioles 3–7 mm long, 1–1.5 mm thick, densely hairy, glabrescent when old; leaf lamina ± elliptic, broadly lanceolate or rarely ± oblong, (1–) 2.5–13 (– 17) cm long, (1–) 2–6 (– 8) cm wide, 1.3–2.5 times longer than wide, widest usually in or slightly above or below the middle, firmly chartaceous, sometimes verrucose (due to subepidermal stone cell granules), glossy + medium green adaxially and paler + dull abaxially (Breteler 4331), or "rich green" adaxially and "tawny buff" abaxially (Steyermark 98975), or dark green adaxially (Wingfield 7811) when alive; lamina on adaxial side medium densely covered with rather long, ± appressed or spreading, ± flexuose hairs, but soon ± glabrescent; lamina on abaxial side of mature leaves scattered or medium densely to densely covered with appressed, spreading or ± patent, strongly tortuous and sometimes also with arched hairs and especially along veins often with longer, slightly flexuose hairs, often ± glabrescent when old; leaf apex broadly rounded, obtuse, acute or less frequently attenuate; base of the lamina rounded or abruptly cuneate; leaf margins entire, revolute especially proximally; flachnectaria few (up to ca. 5) on abaxial leaf surface, usually near base but sometimes also towards

Fig. 5: Holotype of *Diospyros inconstans* JACQ. subsp. *delgadoi* (STANDL.) B.WALLN. [F].

the apex, ± circular; midvein on adaxial side flat or slightly sunken in the proximal ⅔, slightly raised towards the apex, on abaxial side markedly prominent, ± densely hairy on both sides; secondary veins 6–8 per side, slightly prominent adaxially (but often together with their surroundings ± sunken and forming grooves on the adaxial leaf surface; this was reported by Steyermark & Manara 110882 also from living plants), prominent abaxially; intersecondary veins inconspicuous; tertiary and quaternary veins either hardly visible or less frequently (especially on shade leaves or on young leaves) ± reticulate and slightly raised on both sides; **inflorescences** arranged at the base or along the proximal part of new shoots in the axil of leaves (the lowermost ones often in the axil of very small leaves or sometimes in the axil of caducous bracts); male inflorescence units 1–2 cm long, consisting of a simple, (1–) 3 (–4)-flowered, densely hairy cyme; peduncles 4–5 mm long, 1 mm thick; pedicels of the lateral flowers ca. 2 mm long, ca. 0.8 mm thick; female cymes (Fig. 2h) 1-flowered [one young cyme of Sugden & Cardozo 7383 3-flowered]; stalk (peduncle and pedicel) 5 (–10) mm long, 1.5 mm thick, densely hairy; bracteoles of male and female flowers 2–4 mm long, 1–2 mm wide, linear to lanceolate, acute, densely hairy on both sides, caducous; **flowers** 3 (–4)-merous; male flowers (Fig. 2g) 10–13 mm long at anthesis (pedicels excluded); calyx 6–8 mm long and 3–6 mm wide, undivided in the proximal 4–5 mm, densely covered with a felted indumentum of brown, tortuous hairs on the outside and on both sides of the lobes, green when alive; undivided part of the calyx narrowly cup-shaped, glabrous inside; calyx lobes 2.5–4 mm long, 2.5–4 mm wide, ± narrowly semielliptical, widest in the proximal third, acute, flat on margins; sinuses between the lobes inconspicuous; corolla up to 9–11 mm long, greenish-yellow (Flora Falcón 689, Pittier 12158), yellow (Castro & Magallanes 43, Pittier 9068) or adaxially with violet lobes (Flora Falcón 84; after anthesis?) when alive; tube 8–9 mm long, widest in the middle and there ca. 2 mm wide, tapering distally, on the outside densely covered with long and short, appressed or spreading, ± straight, light hairs (which are often strongly bent like a hook near their base) distally, scattered hairy in the middle and glabrous proximally, glabrous inside; throat constricted, ca. 0.8 mm wide; corolla lobes nearly elliptic, 4.5 mm long and 3–3.5 mm wide, obtuse, on abaxial side densely hairy (with long, thick hairs on the keel and short, thin, tortuous ones towards the apex and margins), glabrous adaxially (with small, tortuous hairs near the apex); stamens 10 (only one anthetic flower of Flora Falcón 84 dissected; according to Pittier 9068: 8), strongly differing in length (the inner 3, the outer up to 6 mm long), solitary or a few in pairs, glabrous, adnate to the corolla tube 1 mm above or near its base; filaments 1–3.5 mm long and ca. 0.2 mm wide; anthers 2–2.5 mm long and ca. 0.3 mm wide, widest in the proximal third, tapering into a conical connective appendage distally; rudiment of the ovary consisting of an irregular, densely hairy, longitudinally ± grooved (impressions of filaments) lump of tissue lacking stylodia; **female flowers** (Fig. 2h) up to ca. 10 mm long (pedicels excluded); calyx ca. 6 mm long and ca. 11 mm wide, undivided in the proximal 4 mm, covered with the same felted indumentum as on male flowers; undivided part of the calyx cup-shaped, densely hairy inside; calyx lobes 5 mm long, 6.5 mm wide, acute, spreading (Wingfield 7467), with ± flat margins; proximal part of the lobes adaxially with a gable-like, raised step (± hidden below the indumentum); area around the sinuses between the calyx lobes inconspicuous; corolla up to ca. 9 mm long, green when alive (Wingfield 7467, Sobel et al. 2007); tube ca. 7 mm long, widest ± in the middle, densely covered with long, thick, ± appressed, ± straight, ferruginous hairs on the outside, glabrous near base and inside; throat constricted, narrow (ca.

1 mm wide); corolla lobes ca. 3 mm long and 2 mm wide, obtuse, on abaxial side densely hairy along the keel (as on the tube) and with tortuous hairs towards the margins, glabrous adaxially; staminodia obviously 3 (flowers not available for dissection; one staminodium seen within a partly shattered old corolla still on the top of a young fruit of Steyermark 98975), 4 mm long; filaments ca. 2.5 mm long and ca. 0.2 mm wide, the proximal 1.5 mm adnate to the base of the tube, free distally; antherode lanceolate, ca. 1.5 mm long and ca. 0.3 mm wide, acuminate, glabrous; ovary 3-carpellate, 6-locular, densely covered with appressed, long hairs; style densely covered with long flexuose and with shorter tortuous hairs; stylodia 3, fused proximally, glabrous distally; stalk of the **fruits** up to 5 (–10) mm long, 1.5 mm thick, densely hairy; fruits (Fig. 2i) up to 6-seeded, subglobose to ± depressed globose, up to ca. 1.7 cm in diameter, 1.5 cm high, green with a slight brown tinge, glossy and smooth when immature (Breteler 4331, Sobel et al. 2007), brown (Wingfield 7811, 10001) or nearly black when mature and alive (Sugden & Cardozo 738), brown to blackish brown, verrucose (due to subepidermal stone cell granules) and with tightly adhering epidermis when dry, ± densely covered with ± appressed or slightly spreading, ± flexuose, long hairs when young, glabrescent except at the base and apex, detaching with the calyx; fruit wall ca. 0.5 mm thick when dry; fruit pulp colorless, thin and sweet (Wingfield 7811); calyx on fruits as a whole up to ca. 2 cm wide and 0.5–0.8 cm high, green when alive (González 1033), densely covered with tortuous hairs on all exposed parts, sometimes ± glabrescent when old; area around the sinuses between the calyx lobes inconspicuous; undivided (basal) part of the calyx 8–10 mm wide, plate-shaped, without longitudinal ridges running down from the sinuses abaxially, displaying inside a raised, ± round to slightly triangular platform with rounded corners and convex edges (derived from the gable-like, raised structure in female flowers) which is tightly appressed to the fruit and densely covered with centrifugally arranged, appressed, straight hairs; lobes 6–7 (–9) mm long and 10–12 mm wide, ± semicircular or with an obtuse or acute apex, usually ± strongly flexed downwards (± positioned parallel to the pedicel for their whole length) or spreading, with ± raised longitudinal veins (which are usually hidden below the indumentum) abaxially; seeds bean-shaped, 9–11 mm long, 6–7 mm wide, 4–5 mm thick, brown when fresh (Wingfield 7811), dark when dry.

Notes: The following collections are very typical in having a ± dense, ± ferruginous indumentum composed of strongly tortuous hairs on abaxial leaf surfaces: Delgado 96 (type), Trujillo 6962, Curran & Haman 532, Flora Falcón 84, Liesner et al. 7629, Steyermark & Braun 94593, Steyermark 98975, Tamayo 257, Wingfield 7811 (but leaves old and glabrescent), 10001, and Wingfield & López 7597. The other collections are regarding this more or less atypical: the indumentum is much less dense and is composed of a mixture of ± flexuose, arched and tortuous hairs of varying lengths. Some collections (e.g., Flora Falcón 689, Pittier 12158) display only few tortuous hairs which can be found especially along and near the midvein. These populations could either be the result of adaptations to wetter habitats or represent the result of ancient hybridization with subsp. *inconstans*. Some other collections from western Venezuela (listed at the end of the specimen-list of the latter), however, display no tortuous hairs at all and are discussed there.

Distribution, habitat and phenology: It is known only from western Venezuela where it has been collected in the federal states of Falcón (20 collections), Lara (5), Aragua (2), Guárico (2), Carabobo (1), and Portuguesa (1), (Figs. 3, 6). – It grows in a wide

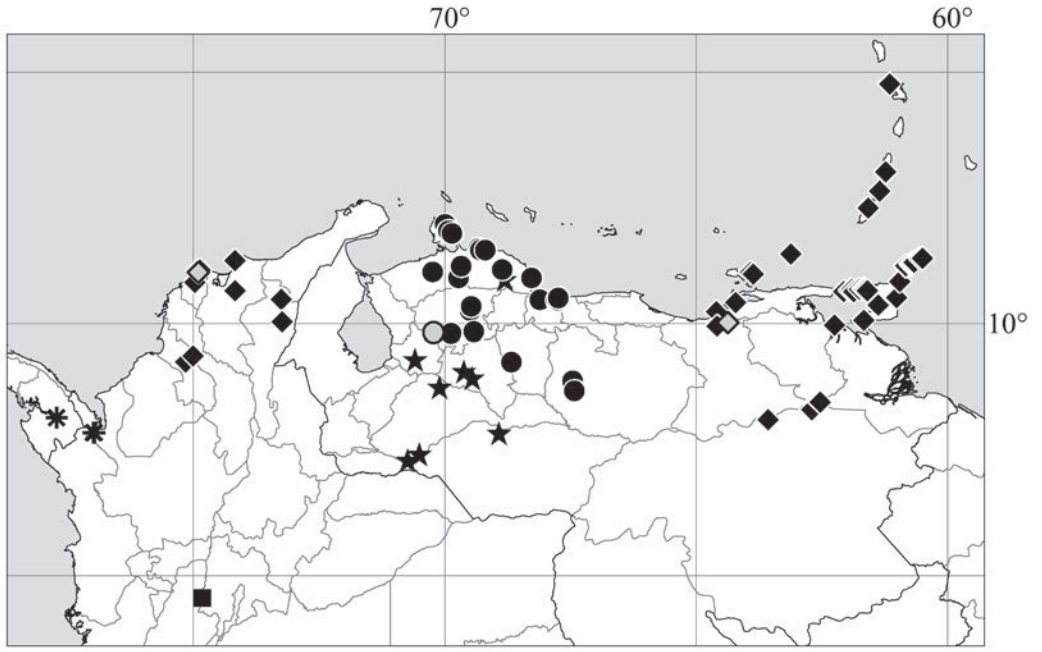

Fig. 6: Distribution of *Diospyros inconstans* in northern South America: subsp. *inconstans* (◆; – locality of the neotype in northern Colombia and type locality of *D. anzoateguiensis* in eastern Venezuela: ◇), subsp. *darienk* (✱), subsp. *delgadoi* (●; type locality: ○), subsp. *psidioides* (■ = locality of the lectotype of *D. velutina*), intermediate populations (★).

range of different habitats. Several collectors reported it from deciduous and semideciduous scrubs and forests on dry, rocky slopes, often on limestone. It was indicated also from a "desert shrub formation" (Steyermark 98975), an "espinar de la costa" (coastal thorn woodland; Trujillo 13376), from matorrales and rastrojos (Bevilacqua 183, 417), a deciduous matorral (Wingfield 10001), a "matorral ralo siempreverde espinoso (an evergreen, sparse, thorny scrub; Ruiz et al. 730), a dense, evergreen forest on limestone (Fernández et al. 119, 122), a "selva nublada" (cloud forest) at 800 meter altitude (Wingfield 7467), from the margin of a dense evergreen cloud-forest on limestone (Sugden & Cardozo 738), and from gallery forests (Gentry & Troth 24749, Castillo 179, Flora Falcón 84). – It was collected at elevations of 10–800 (– ca. 1000) meters, and was found in flower in February, from May to July, in September, and November, and in fruit all over the year except in May and July.

Vernacular names: "cacaito" (Castillo 179), "tuturuco" (Bevilacqua 417).

Specimens examined: **Venezuela**, Falcón, Península de Paraguaná, Reserva Biológica Monte Cano, sistema de Colinas disectadas, Fila de Monte Cano, Piedra Honda, 100–210 m, 11°56–58' N, 69°56'–70°01' W, bosques de ladera semideciduos, matorrales y rastrojos; vegetación arbórea y arbustiva dispersa; sustrato de calizas arrecifales, (yfr), 9 Dec. 1987, **M. Bevilacqua 183** [VEN n.s. (bad dig. photo)], "arbol"; – same area: (fr), 28 Jan. 1988, **M. Bevilacqua 417** [MY n.s. (bad photocopy + fragm. at W), VEN n.s.], "árbol abundante; frutos verdes globosos"; – Cerro Monte Cano, 200 m, [11°58' N, 69°59' W], bosque deciduo seco, (fr), 12 Mar. 1980, **R. Wingfield & M. López Figueiras 7597** [FHO], "árbol ca. 4 m; frutos inmaduros

verdes; – Península Paraguaná, Cerro Santa Ana, 450 m, [11°49' N, 69°56' W], low, primary forest, (fr), 17 Dec. 1964, **F.J. Breteler 4331** [MER n.s., NY, U, VEN n.s., WAG 2×], "slender tree, ± 7 m tall; dbh 7 cm; bark shallowly and finely fissured, black on transverse section; leaves papery, smooth, glossy and medium green above, paler and dull beneath; fruits subglobose, slightly depressed, green, glossy, smooth, up to 15 mm in diameter"; – same Cerro: (fr), 7 Apr. 1917, **H.M. Curran & M. Haman 532** [A, F, GH n.s., K, NY, P, UC, US, Z 2×]; – same Cerro: arriba del pueblo de Sta. Ana, bosque ribereño, (fl male), 30 Nov. 1978, **Flora Falcón (H. van der Werff, R. Wingfield, T. Ruiz & B. Vera) 84** [CORO n.s., FHO], "árbol 5 m; yemas florales verdes; lóbulos de la corola violáceos en su interior"; – same Cerro: 300–400 m, bosque tropófilo, Dec. 1963, **T. Lasser & L. Aristeguieta 3387** [VEN n.s. (bad dig. photo)], "arbusto"; – same Cerro: 800 m, (flbuds female), 17 Feb. 1980, **G.L. Sobel et al. 2007** [NY], "tree 3–4 m; flowers and fruits green, with slight brown tinge"; – same Cerro: ascensión del lado sur desde el pueblo de Santa Ana, 200–300 m (MY: 100–850 m), deciduous forest on dry lower slopes, along stream, (fr), 24 Jan. 1966, **J.A. Steyermark & A. Braun 94593** [MY n.s., NY, US, VEN n.s.], "tree 5 m tall"; – same Cerro: arriba de Moruy, 800 m, selva nublada, (fl female), 17 Feb. 1980, **R. Wingfield 7467** [FHO], "árbol ca. 3 m; flores y frutos inmaduros verdes (con tinte marrón); calyx-lobes 3, spreading"; – El Pizarral, 200 m, [ca. 11°50' N, 69°55' W], matorral ralo siempreverde espinoso, cerros de microrelieve recortado, con pendientes entre 13 y 15%, suelo pedregoso y con algunos afloramientos rocosos, (fr), 11 Mar. 1977, **T. Ruiz Z. et al. 730** [MY n.s. (bad photocopy), VEN n.s.]; – Cerro Colorado, ladera N, 200 m, [11°47' N, 69°51' W], bosque deciduo sobre ladera pedregosa, (fr), 8 Jun. 1980, **R. Wingfield 7811** [FHO], "árbol 6 m; hojas verde oscuro arriba; frutos verdes, ca. 13–14 mm (arriba del borde del cáliz) × 15–16 mm; estilo ca. 2 mm; frutos tornándose algo parduzcos cuando maduros (y negros cuando se marchitan); semillas marrones con una capa delgada dulce sin color"; – a 3 km de fábrica de cemento, cerca de Puerto Cumarebo, en la cercanía de la mina de cemento, 200 m, [11°29' N, 69°19' W], bosque siempre verde; árboles de 15 a 20 m, (fl male), 31 May 1979, **Flora Falcón (H. van der Werff & T. Ruiz) 689** [FHO], "árbol 10 m; cáliz verde; corola amarilla verdosa; madeira muy dura"; – Distrito Zamora, Cerro Mampostal, 400 m, 11°27' N, 69°17' W, (fr), 4 Aug. 1977, **A. González 1033** [K, MO, VEN n.s.], "árbol mediano; frutos verdes con cáliz verde", [erroneously as "10333" at K]; – Cerro El Caballo, 53 km E de Coro, ca. 300 m, [11°27' N, 69°11' W], selva siempreverde denso sobre caliza, (st), 11 Aug. 1980, **S. Fernández et al. 119** [FHO], "árbol 6 m; estéril"; – same locality, date and collectors: **122** [FHO, MER n.s.], "árbol 5 m; estéril"; – Distrito Democracia, Fila Pueblo Nuevo, 20 km S de Urumaco, ladera E, (76 km SE de Coro), ca. 450–550 m, [11°1' N, 70°14' W], matorral caducifolia sobre ladera pedregosa, (fr), 25 Jun. 1982, **R. Wingfield 10001** [FHO], "arboles ca. 4 m; frutos marrones"; – Sierra de San Luis, Piedra de Agua, ca. 600 m, 11°08' N, 69°40' W, (fl male), 20 Jun. 1979, **R.L. Liesner et al. 7629** [FHO, K, MO, VEN n.s.], "3 m tree; buds greenish"; – Distrito Federación, Agua Larga, 350 m, [10°54' N, 69°43' W], bosque deciduo e inerme; planicie lisa, (fr), 14 Feb. 1977, **T. Ruiz Z. & Equipo de Ecología 346** [CORO n.s., VEN n.s. (dig. photo)]; – Distrito Acosta, Cerro Jacura, cumbre, 98 km ESE of Coro, 602 m, 11°04' N, 68°51' W, bosquecillo denso sobre rocas calcáreas soleadas; margin of evergreen cloud-forest on limestone, (flbuds female, fr), 3 Sep. 1981, **A.M. Sugden & A. Cardozo 738** [FHO 6×], "árbol 4 m, muy ramificado; corteza gris; pubescencia en las hojas y los tallos jóvenes plateados; frutos maduros casi negros"; – Distrito Silva, "La Peñita" (vieja toma de agua) de las escarpas calcáreas que miran al norte, a lo largo del Golfete de Guare, al sur de Chichiriviche, 10–100 m, 10°54' N, 68°16–17' W, barranca con bosque, (fr), 30 Aug. 1974, **J.A. Steyermark & B.J. Manara 110882** [MO, NY, VEN n.s.], "small tree 3 m; leaves firmly membranous, rich green with sulcate nerves above, paler green below". – Lara, N of Bobare, 650 m, [10°20' N, 69°28' W], desert shrub formation, (fl female), 15 Jul. 1967, **J.A. Steyermark 98975** [FHO, NY 2×, VEN n.s.], "calyx lobes 3; leaves subcoriaceous, rich green above, tawny buff below"; – along road to Coro, 30 km N [NW] of Barquisimeto, [ca. 10°15' N, 69°29' W], (fl female?), 3 Nov. 1967, **S.S. Tillett 6711-557** [VEN n.s. (dig. photo)], "tree to 3 m; flowers brown tomentose"; – El Chaparral, El Tocuyo, [9°48' N, 69°52' W], en faldas de cerro subxerófilo, (yfr), Aug. 1937, **F. Tamayo 257** [F, NY, US, VEN n.s.], "árbol 2–3 m"; – Via Buena Vista, en lo alto, [ca. 9°50' N, 69°25' W], (fr), 12 Nov. 1977, **R.F. Smith V8578** [VEN n.s. (dig. photo)]; – Alto El Cocuizal, carretera Buena Vista, ca. 1000 m [Carmen Benítez sent me via email, 13th Jan. 2002, the precise collection data: "Municipio Iribarren, Quebrada La Ruesga, alrededores del Caserío Tin-Tin, 9°49' N, 69°25' W"], (yfr), 12 Sep. 1964, **B. Trujillo 6962** [MY n.s. (bad photocopy + fragm. at W)], "árbol pequeño, escaso; hojas, ramas jóvenes y perianto, con indumento pardo rojizo". – Carabobo, vicinity of El Palito, [10°28' N, 68°6' W], in dry bushes close to seashore, (flbuds male), 24 Sep. 1920, **H. Pittier 9068** [GH, VEN n.s.], "tree not over 2 m, spreading; the yellow, 3-merous flowers, partly cauline are caducous; stamens 8; ovary sterile". – Aragua, costa de Cata, [10°30' N, 67°44' W], espinar de la costa, (yfr), 20 Oct. 1975, **B. Trujillo 13376** [MY n.s. (bad photocopy

+ fragm. at W)], "arbusto"; – Beach at Ocumare de la Costa, [10°27' N, 67°46' W], (fl male), 2 Apr. 1926, **H. Pittier 12158** [NY], "small tree; flowers greenish-yellow"; – Municipio Mario Briceño Iragorry, P. N. Henri Pittier, Sendero Cata-Catica, Bahia de Cata, [10°27' N, 67°44' W], (fl male), 30 May 1992, **M. Castro & A. Magallanes 43** [MY n.s. (bad photocopy + fragm. at W)], "arbusto ca. 4,5 m; hojas pubescentes; abundantes botones florales; flores masculinas con corola amarilla". – Portuguesa, Distrito Turén, 12 km al SE de Sta. Cruz, Reserva Forestal de Turén, [ca. 9°14' N, 68°40' W], (fr), 26 Feb. 1969, **L. Marcano Berti 2033** [MER n.s. (dig. photo)], "arbolito; fruto 5-spermo". – Guárico, Rio Orituco, al sur de Calabozo, 100 m, [ca. 8°52' N, 67°27' W], vegetación de vegas del bosque de galería del Rio, (fr), 29 Aug. 1975, **A. Castillo S. 179** [VEN n.s. (dig. photo)], "árbol siempreverde; frutos inmaduros"; – along Río Guarico, Blum Ranch S of Calabozo, Llanos, 70 m, [ca. 8°40' N, 67°25' W], gallery forest, (st), 14 Feb. 1979, **A.H. Gentry & R.G. Troth 24749** [FHO, MO], "tree 4" dbh".

***Diospyros inconstans* Jacq. subsp. *obovata* (Mart. ex Miq.) B.Walln., comb.n.** – [Figs. 3, 7–9].

≡ *Macreightia obovata* Mart. ex Miq., Fl. Bras. (Martius) 7 (17): 9–10, tab. 2, fig. 3 (1856).

≡ *Maba inconstans* (Jacq.) Griseb. var. *obovata* (Mart. ex Miq.) Hiern, Trans. Cambridge Philos. Soc. 12 (1): 128 (1873).

Protologue: "crescit in campis altis prov. Minarum, ad sepes et in silvulis Capoês".

Typus: Brasil, Minas Gerais, a Agoa gente [not located], (fl male), s.d., **J.B.E. Pohl 1863 (D.n° 1980)** [lectotype (here designated): BR (the twig on bottom; Fig. 7), isolectotypes: F (fragm. ex W), K, W 3× (photo F 31940 at MO, US)]; – syntypes: Brasilia australis, (fl male), s.d., **F. Sellow 1540** [BR 2×].

= *Annona imbitibana* Glaz., Mém. Soc. Bot. France 1 (3): 14 (1905).

Typus: Brasil, Rio de Janeiro, Imbitiba [= Imbetiba, now Macaé], dans les bourbiers [protologue: près de la mer], [22°23' S, 41°47' W], (flbuds female), 1 Aug. 1891, **A.F.M. Glaziou 18126** [lectotype: P (here designated), isotypes: B n.s. (destroyed?), C, G n.s., K, LE n.s.], "arbuste; fl. verdâtres".

– "*Maba argentinensis* Speg.", invalid name cited by Latzina (1937), Devoto & Rothkugel (1942), and Marzocca (1950).

Shrub or tree up to 10 (–15) m tall (already flowering when ca. 1 m tall), deciduous or tardily deciduous ("evergreen" according to Lorenzi 1998, 2000); trunk diameter up to 20 cm (20–40 cm according to Lorenzi 1998, 2000); bark smooth or fissured, often said to be ash-gray, sometimes brownish or blackish, inside black (Schulz 252); **indumentum** consisting of simple, appressed, spreading or patent, straight or flexuose hairs of varying length; twig apices and buds densely covered with appressed hairs; young twigs subterete, gray to brown when dry, scattered or ± densely covered with ± spreading or patent, often tortuous, brown or sometimes ± ferruginous hairs and at least on some specimens also with patent, whitish-translucent, stiff, minute hairs, often soon glabrescent; **leaves** alternate, with brochidodrome venation; petioles 5–8 (–10) mm long, 1–2 mm thick, ± canaliculate, medium to densely hairy, later often glabrescent especially abaxially; leaf lamina obovate, less frequently ± elliptic, sometimes lanceolate, rarely ± oblong, (1–) 3–9 (–15.5) cm long, (1–) 1.5–4.5 (–8) cm wide, (1–) 2–3 (–3.6) times longer than wide, widest usually above the middle, rarely in the middle, firmly chartaceous, with a raised and markedly reticulate venation on both sides especially when

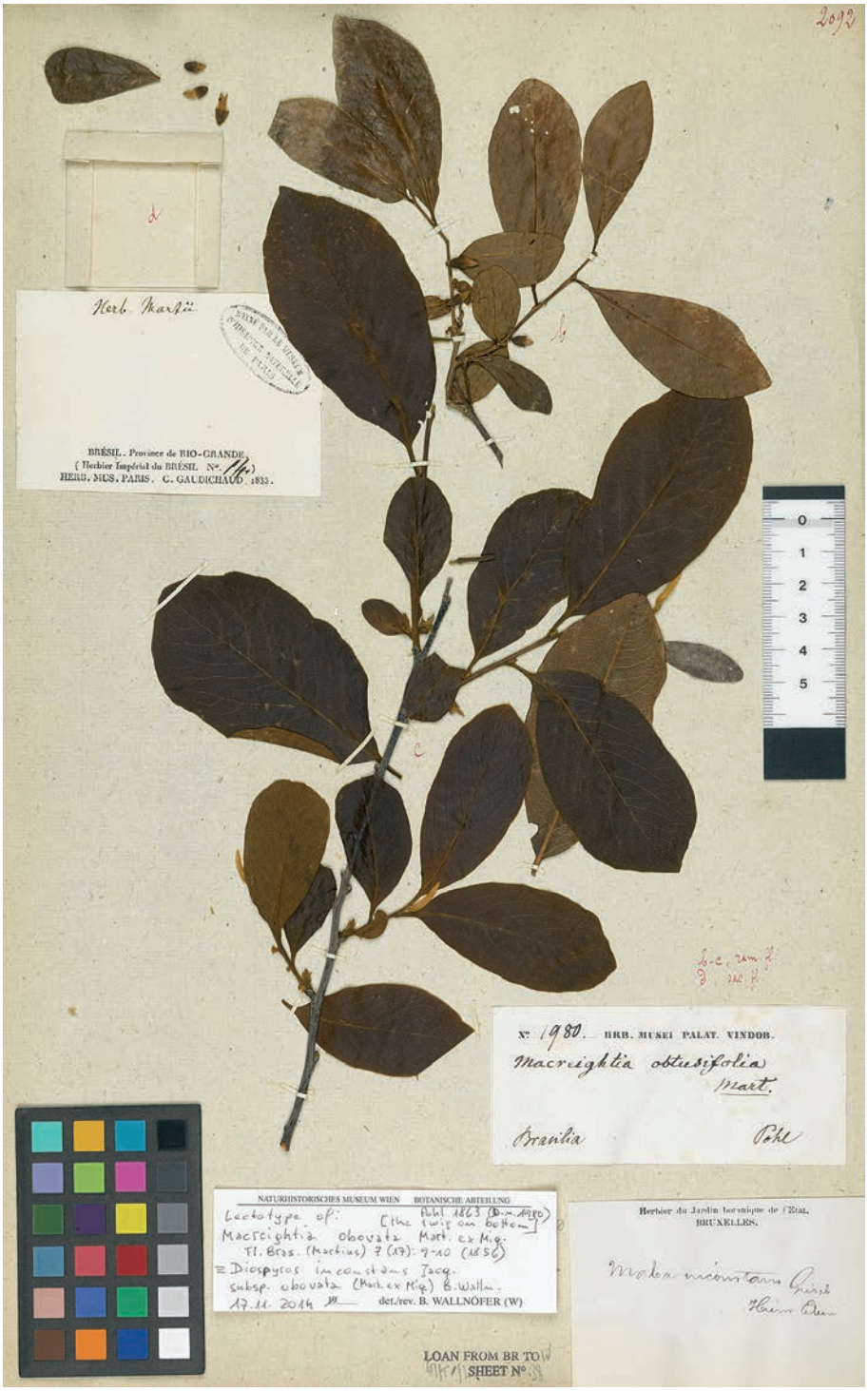

Fig. 7: Lectotype of *Diospyros inconstans* JACQ. subsp. *obovata* (MART. ex MIQ.) B.WALLN. [BR].

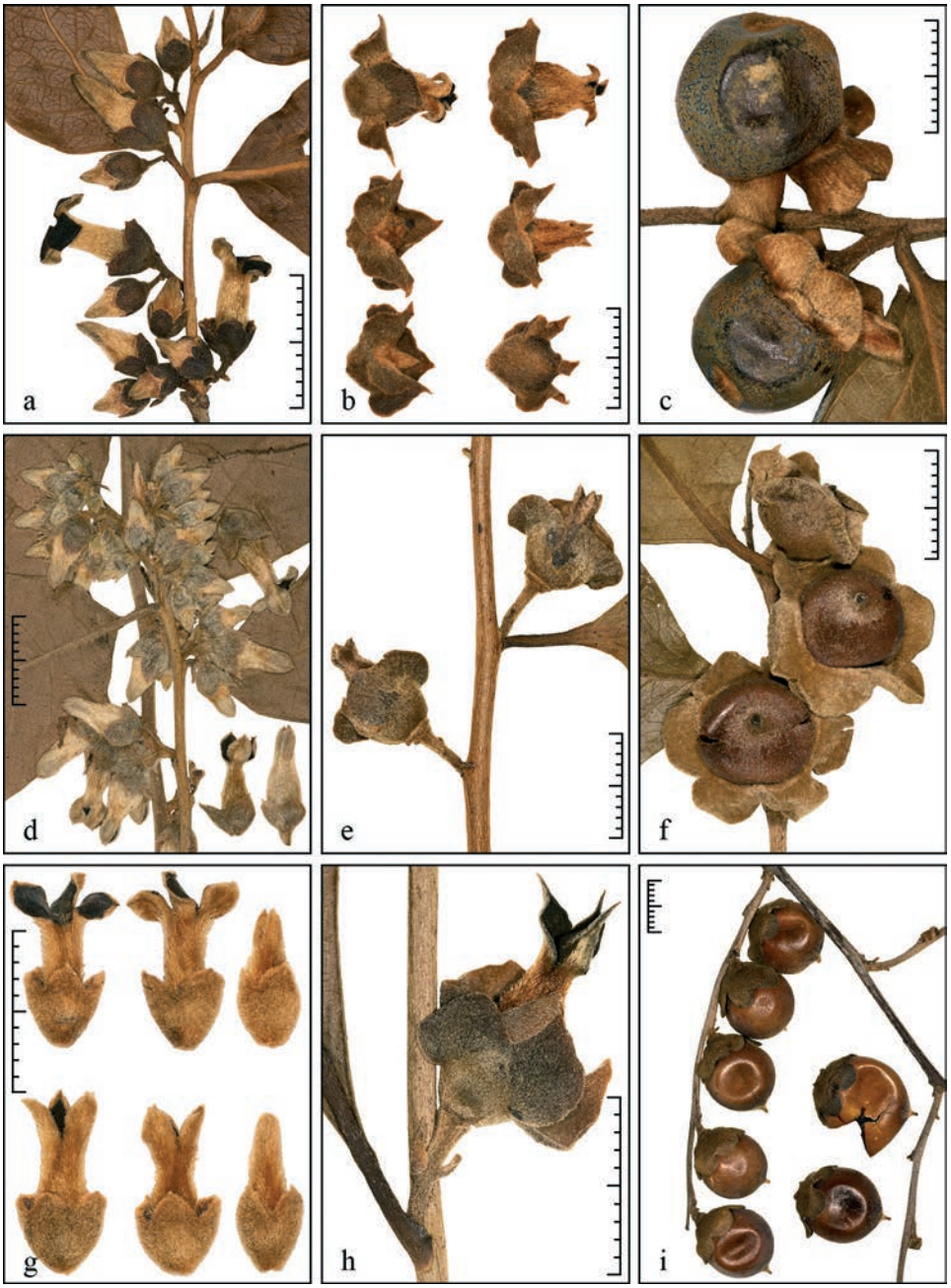

Fig. 8: *Diospyros inconstans* subsp. *obovata* (a–c): a: male flowers (from Hassler 12387 [S]); – b: female flowers (from Glaziou 11164 [on left side: NY, on right side: G]); – c: fruits (from Paula & Mendonça 1256 [W]); — subsp. *psidioides* (d–i): d: male flowers (from Asplund 15257 [S]); – e: female flowers (from Nee 37955 [NY]); – f: fruits (from Mostacedo & Lopez 2581 [NY]); – g: male flowers (from Klug 4270 [on top: CAS, on bottom: F]); – h: female flowers (from Prance et al. P26389 [MICH]); – i: fruits (from Silva et al. 1089 [NY]); – scale = 1 cm.

mature, often verrucose (due to subepidermal stone cell granules), discolorous, dark green and usually glossy adaxially (shiny-green according to LORENZI 1998, 2000), lighter green and dull abaxially when alive, glossy adaxially, dull abaxially when dry, on adaxial side ± glabrous or with a medium dense indumentum of straight, arcuate or ± flexuose, usually patent hairs, on abaxial side ± glabrous or medium densely to densely covered with appressed, spreading or patent, ± flexuose, sometimes ± tortuous, and usually longer hairs; leaf apex obtuse, broadly rounded, acute, or less frequently ± emarginate; base of the lamina cuneate or attenuate; leaf margins entire, revolute especially proximally; flachnectaria up to ca. 7 on abaxial leaf surface, usually near base but rarely some also towards the apex, circular or ± elliptic; midvein on adaxial side deeply sunken (canaliculate) in the proximal ca. ½, flat or slightly raised towards the apex, ± densely covered with ± patent hairs, on abaxial side markedly prominent, glabrous or scattered to densely covered with appressed or spreading hairs; secondary veins 8–9 per side, ± glabrescent adaxially, hairy abaxially, prominent on both sides (but often together with their surroundings ± sunken and forming grooves on the adaxial leaf surface), often lighter than the lamina abaxially (especially in southern populations); intersecondary veins inconspicuous; tertiary to quinternary veins raised and markedly reticulate on both sides; **inflorescences** arranged at the base or along the proximal part of new shoots in the axil of leaves (the lowermost ones often in the axil of very small leaves or sometimes in the axil of caducous bracts); male inflorescence units up to ca. 1.5 cm long, consisting of a simple, (1–) 3 (–4)-flowered, densely hairy cyme (Fig. 8a); peduncles 2–3 mm long, ca. 1 mm thick; pedicels of the lateral flowers 1–2.5 mm long, ca. 0.8 mm thick; female cymes 1-flowered; stalk (peduncle and pedicel) 3–4 (–10) mm long, 1 mm thick (slightly enlarged distally), densely hairy; bracteoles of male and female flowers 2–3 mm long, ca. 1 mm wide, ± lanceolate, ± acute, hairy abaxially, ± glabrous adaxially, soon caducous; **flowers** 3 (rarely 4)-merous, pendulous according to LORENZI (1998, 2000); male flowers (Fig. 8a) 7–11 mm long at anthesis (pedicels excluded), markedly differing in size between populations; calyx green when alive, 3–6 mm long and 2.5–5 (– ca. 7) mm wide, undivided in the proximal 2–4 mm, on the outside (including the lobes) medium densely to densely covered with short, appressed to slightly spreading, ± flexuose hairs (sometimes only scattered hairy); undivided part of the calyx ± cup-shaped, inside either completely glabrous (e.g., Caballero Marmori 708, Glaziou 19613, Hassler 12387, Sellow 1689) or densely covered with appressed, straight, quite long hairs ± except near the base (e.g., Jarenkow 515, Schultz ICN 7880); calyx lobes (1–) 1.5–3.5 mm long and (2–) 2.5–5 mm wide, not covering each other laterally, varying from ± semicircular, to semielliptical, ± triangular, ± truncate to slightly retuse, often with a small tip distally, with flat or slightly revolute margins, on adaxial side scattered to densely covered with ± patent hairs or sometimes glabrous except along the margins; proximal part of the lobes adaxially without or with (e.g., Caballero Marmori 708) a small gable-like, raised, ± densely hairy step; sinuses between the lobes either inconspicuous or ± protruding outwards; calyx lobes of some populations (e.g., Caballero Marmori 708, Schultz ICN 7880) enlarged, somewhat spreading and flexed outwards near their base, thus, resembling a little bit those of female flowers; corolla green, greenish-yellow, greenish-white, whitish-yellow, cream or white when alive, 8–10 mm long; tube 7–8 mm long, widest in or below the middle and there 2.5–3 mm wide, densely covered with long and short, ± appressed, ± straight, sometimes ferruginous hairs on the outside, glabrous near base and inside; throat constricted, ca. 0.5 mm wide; corolla lobes 3.5–4 mm long, 2–3 mm wide,

lanceolate, ± elliptic, or ovate, obtuse, acute or rounded distally, on abaxial side densely hairy along the keel (as on the tube) and with a dense indumentum of short hairs towards the margins, glabrous adaxially; stamens usually 12 (flowers of Caballero Marmori 708, Hassler 12387, Schultz ICN 7880 and Sellow 1689 dissected), apparently less frequently 11 (Glaziou 19613), 13 (Jarenkow 515) or 17 (one 4-merous flower bud of Hassler 12387), usually in pairs, strongly differing in length (the inner 1.5–2.5, the outer up to 4–5.5 mm long), glabrous (but sometimes with few appressed hairs on one side of the connectives), adnate to the corolla tube ca. 0.5 mm above its base; filaments 0.5–2.5 mm long and ca. 0.2 mm wide; anthers 1–3 mm long and ca. 0.5–0.8 mm wide, widest near base, tapering into a ± short, conical connective appendage distally; rudiment of the ovary densely hairy, lacking stylodia; **female flowers** (Hassler 3354, Rambo 813 at SP, Schultz ICN 7913, Fig. 8b) 7–12 mm long (pedicels excluded), markedly differing in size between populations; calyx green when alive, (4–) 6–9 mm long and (7–) 10–13 mm wide, undivided in the proximal 2–3 mm, on the outside (including the lobes) medium densely to densely covered with short, appressed to spreading, ± flexuose or sometimes even tortuous hairs (less densely on lobes); undivided part of the calyx ± widely cup-shaped, inside densely covered with appressed, straight, long hairs, ± glabrous near the base; calyx lobes (3–) 5–6 mm long, 5–8 mm wide, semicircular to semielliptical, rounded, acute, ± truncate or retuse distally, often ending with a small tip, with ± raised longitudinal veins abaxially, densely covered with spreading or ± patent hairs adaxially; margins flat, slightly involute or revolute, sometimes ± undulate, ± strongly flexed outwards near their base; proximal part of the lobes adaxially with a gable-like, raised, densely hairy step; area around the sinuses between the calyx lobes ± protruding outwards; corolla green, greenish-yellow, cream or whitish when alive (see also color photos in Lorenzi 1998, 2000), 8–10 mm long; tube 6–8 mm long, widest ± in or below the middle and there 3–3.5 mm wide, densely covered with ± straight, long and short, ± appressed or slightly spreading hairs on the outside, glabrous near base and inside; throat constricted, ca. 0.5–1 mm wide; corolla lobes quite small and thick, 2–3 mm long, 2 mm wide, erect, ± triangular, acute, on abaxial side with long, thick hairs along the keel and with shorter, thin hairs towards the margins, on adaxial side glabrous, but sometimes with scattered, tiny hairs towards the apex; staminodia 3, episepalous, 4–5 mm long, adnate to the corolla tube ca. 0.5–1 mm above its base, free except at base, glabrous; antherodes flat, narrowly lanceolate, 1.5–2 mm long and 0.2–0.3 mm wide, acute distally; ovary 3-carpellate, 6-locular, as a whole 4–6 mm long, 2.5–3 mm in diameter, densely covered with ± appressed, ± straight hairs, tapering into the ca. 1–2 mm long, conical style; stylodia fused nearly up to the apex; stigmata 3, bilobed; stalk of the **fruits** ca. 3 mm long, 2 mm thick; fruits (Fig. 8c) up to 6-seeded, ± depressed globose, up to 2–3 cm in diameter, green when immature, shiny and changing color from yellowish to vine-red, violet, brown and finally to black when fully ripe [according to Corrêa (1952): black, Lorenzi (1998, 2000): shiny-purple, and Santos & Sano (2007): vine-red to black when fully ripe], brown to black, smooth and with tightly adhering epidermis when dry, with ± appressed brown or sometimes ferruginous hairs when young, soon glabrescent except at the apex when maturing, detaching with the calyx; fruit wall ca. 0.3 mm thick when dry; mesocarp yellow when alive; calyx on fruits as a whole 1.2–2 cm wide and ca. 0.6 cm high, green when alive, covered with indumentum (see female flowers), but sometimes partially glabrescent; area around the sinuses between the calyx lobes protruding out- and downwards; undivided (basal) part of the calyx 7–10 mm

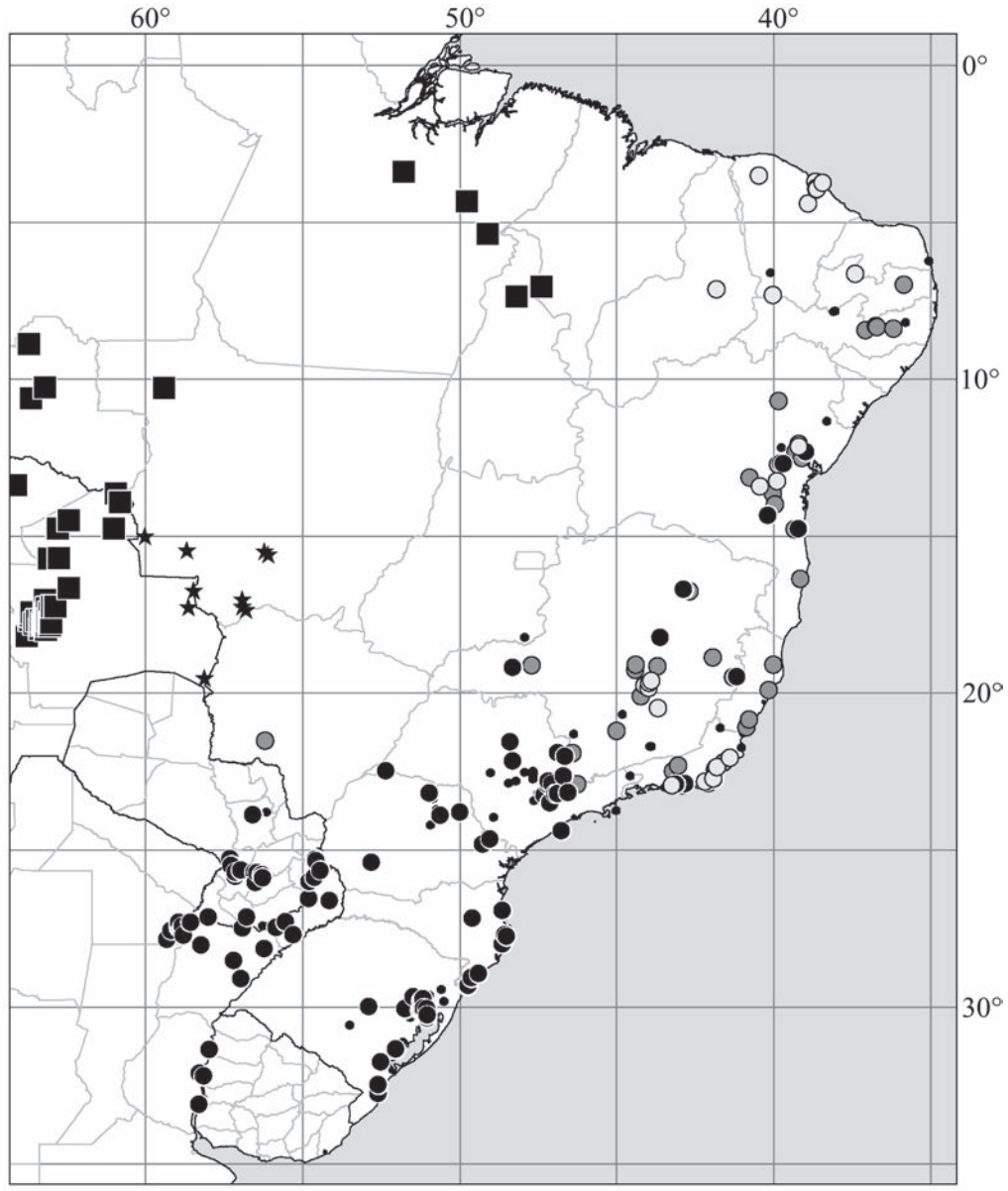

Fig. 9: Distribution of *Diospyros inconstans* subsp. *obovata* according to its indumentum: abaxial leaf surfaces densely hairy (○), abaxial leaf surfaces ± medium densely hairy (◍), abaxial leaf surfaces ± glabrous (●), specimens not available for analysis of the indumentum (•); – subsp. *psidioides* (■), intermediate populations with subsp. *psidioides* (★).

wide, plate-shaped, without longitudinal ridges running down from the sinuses abaxially, displaying inside a raised, triangular platform with rounded corners and convex edges (derived from the gable-like, raised structure in female flowers) which is tightly

appressed to the fruit and densely covered with centrifugally arranged, appressed, straight hairs; lobes 4–5 mm long and 8–10 mm wide, only slightly or strongly emarginate (in the latter case the lobes appear to be bilobed), usually with the midvein ending as a small tip in the sinus, sometimes with ± raised longitudinal veins abaxially, in some populations slightly apposed to the fruit or spreading, in others flexed downwards (± positioned parallel to the pedicel for their whole length); seeds ± bean-shaped, 8–15 (–18) mm long, 6–8 (–10) mm wide, 4–6 mm thick, brown when fresh, dark when dry.

Notes: This subspecies inhabits a vast area and is quite variable. It seems impossible to split it up into more taxa. The indumentum of the abaxial leaf surface ranges from very dense to nearly glabrous (Fig. 9). The populations in Mato Grosso (Brazil) seem to be intermediate between subsp. *obovata* and *psidioides* and are listed separately after the specimen list for subsp. *psidioides*. The leaves are not always obovate, less frequently they are ± elliptic, sometimes lanceolate, and rarely ± oblong. The leaf apex is typically broadly rounded or obtuse, but this is often not the case. Young and shade leaves are often also atypical.

Figures: branch and male flowers (Miquel 1856: tab. 2, fig. 3); branches with fruits (Lombardo 1943: plate 6); branch with fruits, flowers (Marzocca 1950: fig. 5); pollen (Salgado-Labouriau et al. 1969: figs. 4–6); branch, leaves, male and female flowers, fruits, seeds (Burkart 1979: figs. 8–9; same figures in Reitz 1988: est. 1–2); tree, bark, wood, branch with female flowers, fruits and seeds (same color photos: Lorenzi 1998, 2000, Souza & Lorenzi 2005); branch, leaves, male flower, fruits (Lopes 1999: figs. 1b, 2c–f, 4); tree, bark, branches with fruits (same color photos: Backes & Irgang 2002, 2004); branch with fruits, female flower (Santos & Sano 2007: plate 1.I–J). – The following color photos which were published under the wrong name "*D. obovata* Jacq." seem to represent plants from intermediate populations with subsp. *psidioides*: branch, leaves, female flowers, fruits (Pott & Pott 1997); tree, bark, wood, branch with female flowers, fruits and seeds (Lorenzi 1998, 2000). [Note: *D. obovata* Jacq. is a synonym of *D. tetrasperma* Sw., a species which occurs only in Central America and on some islands in the western Caribbean Sea (see Wallnöfer 2011). According to digital photos seen, the populations in Mato Grosso which are called "*D. obovata* Jacq." by Marimon et al. (2002, 2010) do not belong to *D. inconstans* but to *D. dalyom* B.Walln.]

Wood, anatomy and pollen: The specific gravity of the wood is reported to be 0.56 kg/dm^3 (Latzina 1937), or 0.83 g/cm^3 (Lorenzi 1998, 2000, Backes & Irgang 2002, 2004). According to Lorenzi, the wood is heavy, has a fine texture, is straight-grained, has a good mechanical resistance and does not rot easily. The anatomy of the wood was studied by Marchiori (1983), Marchiori et al. (2009, 2010), and Santos & Marchiori (2010). The pollen has been described and illustrated by Salgado-Labouriau et al. (1969).

Distribution and phenology: The distribution in Brazil ranges from the states Piauí and Ceará in the northeast to Rio Grande do Sul in the south, (Figs. 3, 6, 9). A distribution map for the state Santa Catarina in southern Brazil was published by Reitz (1988). In Paraguay it occurs only in the eastern and southern departments and is apparently missing in the Gran Chaco. In Argentina it was collected only in the provinces Chaco, Corrientes, Misiones, and Entre Rios in the northeast. In Uruguay it is rare and restricted to forests along rivers in the departments Salto and Rio Negro. Burkhart (1979) indicates

it also for the Uruguayan department Colonia (Palmira, un poco al N de Carmelo [33°55' S, 58°18' S]) and LOMBARDO (1943) for Paysandú [ca. 32°19' S, 58°4' S]. – It was collected from sea level up to elevations of ca. 1128 meters (only few data are, however, available). Usually it flowers from October to December but it was sometimes found flowering also in the other months. It was collected in fruit all over the year but the mean fruiting season is from January to June.

Habitat (compiled from data given on the herbarium labels): In **Brazil** it was collected in semideciduous or ± deciduous forests (e.g., floresta estacional, mata mesófila semidecídua, mata estacional-decidual, caatinga), in forests along rivers (gallery forests, mata ciliar, mata de galeria), in woods and thickets along the coast, and frequently on coastal dunes covered with a shrubby or arboreal vegetation called restinga. It is often reported from sandy and stony places, sometimes from woods and thickets on calcareous outcrops, from ± humid places, and only occasionally from savanna woodlands (cerrado), and montane forests (brejos de altitude in Pernambuco). It has often been found in disturbed and secondary forests and woods (mata alterada, mata secundária), and in the capoeira, an anthropogenic, secondary vegetation rich on grasses and with interspersed shrubby trees. In **Paraguay** it was found in forests (often disturbed) along rivers and on hills, in thickets, in scrub on rocky summits, and in a "campo cerrado". In **Argentina** it was collected especially in riverine forests and woods but sometimes also in thickets and hilly woodland.

In the range of the Atlantic Forest it occurs in the "floresta estacional decidual" (deciduous forest), the "floresta estacional semidecidual" (semideciduous forest), in "formações campestres", and in the restinga (SANTOS & SANO 2009). According to MARKUS & FREITAS (2011), in Rio Grande do Sul it grows in the "floresta estacional decidual", "floresta estacional semidecidual", "floresta ombrófila mista" (mixed rainforest), and the "floresta ombrófila densa" (dense rainforest).

Biology and ecology: *D. inconstans* subsp. *obovata* is regarded as a "light-demanding" species by BUDKE et al. (2008) and is according to OVERBECK & PFADENHAUER (2007), a "non-sprouting" species after fire and, thus, an "obligate seeder". It is regarded as an "early secondary succession species" by SOUZA et al. (2010). At least the southern populations are definitely deciduous. In Minas Gerais it was reported to be tardily deciduous: the leaves of the previous season are shed shortly before the new ones are expanded and flowering occurs (WARMING 1874). LORENZI (1998, 2000), however, indicates it as being evergreen. I have seen, however, no herbarium specimens so far which display old and new leaves on the same twig! This matter requires further investigation! – LOPES (1999) observed ants scrambling all over the plant. They are attracted without doubts by the sugar-rich liquid secreted by the flachnectaria which are located on abaxial leaf surfaces!

It is mentioned (as *D. inconstans* or *D. velutina*) in numerous studies dealing with the vegetation and forest structure in Brazil and is classified as common in the southern Brazilian Atlantic rainforest by CAIAFA & MARTINS (2010). MÜLLER et al. (2012: table 1) recorded 56 individuals taller than 80 cm in 72 large plots (with a total of 1458 m^2) and 224 individuals taller than 10 cm in 216 small plots (486 m^2) in the area of the Morro Santana near Porto Alegre in Rio Grande do Sul. SCIPIONI et al. (2009) reported 25 individuals per hectare from a deciduous forest and BUDKE et al. (2008) 10 individuals per hectare from a riverine forest in the same state. A study concerning the size, structure

and conservation status of some populations in the same state was carried out by Souza et al. (2010). It is also quite frequent along the coast in the restinga in Rio de Janeiro and in Rio Grande do Sul (e.g., Lopes 1999, Dorneles & Waechter 2004). According to Cardoso & de Queiroz (2008), it is one of "the commonest species found at forest edges and in disturbed sites" in the Serra de Orobó in central Bahia. Rodrigues et al. (2003: tab. 3) found 91 individuals with a dbh ≥ 15.5 cm in 32 plots of 20 × 20 m (1.28 ha) in the forest "Mata do Galego" near Luminárias in Minas Gerais.

Seeds, seed dispersal and germination: According to Lorenzi (1998, 2000), one kilogram of seeds contains about 2.370 units. The viability of the seeds in storage is less than 30 days. Germination occurs in 80–100 days and the germination rate is usually above 70 %. According to Marzocca (1950), it germinates easily and at a high rate.

The fruits are eaten by birds called jacus und aracuãs (family Cracidae, genera *Penelope* and *Ortalis*), by humans and other animals (Corrêa 1952, Lorenzi 1998, 2000 and Backes & Irgang 2002, 2004). The birds *Penelope superciliaris* (rusty-margined guan) and "Saíras" (*Tangara* or a related genus) are indicated as consumer of the fruits by Zaca et al. (2006), and Souza (1005, 1073), respectively. Another seed disperser is the primate *Alouatta guariba clamitans* (brown howler monkey; Liesenfeld 2003, Liesenfeld et al. 2008, Marques et al. 2008, see also Buss et al. 2009). The fruits of "*D. obovata*" (see above) are consumed by large-tailed squirrels, cukoos, piping guans, parrots, parrakeets, toucans, and howling monkeys (Pott & Pott 1997).

Vernacular names: In Brazil it is called as follows (from the north to the south): in **Ceará**: "araçá bravo" or "araçá tingui" (Allemão & Cysneiros 964), "café bravo" (Ducke 2358, 2400, Lima-Verde et al. 644), "fruta de cabra" (Moro et al. 2011), "marmaleiro" (Gardner 1512 [mixed up with *D. coccolobifolia*?]); in **Bahia**: "canela de jacu" (Borges 23), "carrapato" (Hage 2184, Silva et al. 2008), "fruta de jacú" (Bautista & Pinto 772); in **Espirito Santo**: "caquí de minas" (Folli 1351, 5926), "jaboticaba da praia" (Folli 1351); in **Minas Gerais**: "azeitona" (Teixeira s.n.) [correct? the specimen was misidentified as *Heisteria*], "caqui de minas" (da Luz 3), "caquí roxo" (da Luz 375), "caqui silvestre" (Campos BHZB 2142), "fruta de jacú do mato (macho)", and rarely "cinzeira" (Warming 1874), "marmelinho" (Campos BHZB 2142); in **Rio de Janeiro**: "bajeru" (Santos et al. 1407), "bajirú" (Santos 1825), "caqui selvagem" (Kneip 2009); in **São Paulo**: "caqui do mato" (Cardoso-Leite & Oliveira 356), "caquinho do mato" (Baitello & Aguiar 9123), "fruta de jacú" (Cunha 77, Rodrigues & Zandoval 36), "fruta de jacu macho" (Viégas IAC 8074, Santos & Sano 2007), "marmelinho" (Santos & Sano 2007); in **Santa Catarina**: "cerejeira do mato", "cinzeiro", "granadillo", "fruta de jacu do mato", "fruta de jacu macho", "maria preta", (Reitz et al. 1978, Reitz 1988); and in **Rio Grande do Sul**: "caquizeiro silvestre" (Marchiori et al. 2009), "caquizinho do mato" (Hagelund 10859, 10991, 12955), "fruta de jacu macho" (De Marchi 24, Marchiori et al. 2009, Reitz et al. 1983), "fruto de jacu macho" (Mondin & Lob 1901), "jaboticaba do mato" (Reitz et al. 1983), "maria preta" (Hagelund 10859, 10991, 12955, Kray 63, Matzenbacher ICN 44492, Mondin & Lob 1901, Marchiori et al. 2009, Reitz et al. 1983). – Some of these names are also given in general for Brazil by Corrêa (1952), Lorenzi (1998, 2000), and Backes & Irgang (2002, 2004). The additional name "marmelinho do mato" is only indicated in Lorenzi (1998, 2000). – Glaziou (1905–1913) cites for his collection 11172 from Rio de Janeiro the vernacular name "araça tinga". However, he may have inappropriately copied it from the labels of Allemão & Cysneiros

964 kept in R (see above under Ceará; for further information about this matter compare also WURDACK 1970). – POTT & POTT (1997) quoted for their "*D. obovata*" (see above), most likely by error, the name "olho de boi", a vernacular name which is widely used for *D. hispida* A.DC. only.

In Paraguay (Central) subsp. *obovata* is called "guyaibi-rai" (Hassler 12287), and in Argentina "granadillo" (LATZINA 1937, MARZOCCA 1950, BURKART 1979, HUNZIKER 1984).

Use: According to CORRÊA (1952), the fruits are edible but the taste is described as insipid. They were a source of food for the ancient tribes (KNEIP 2009). The wood is or was used for making tool handles, various small objects, and stakes (fueiros), as firewood and for the production of charcoal (CORRÊA 1952; LORENZI 1998, 2000; BACKES & IRGANG 2002, 2004). As indicated on the label of Santos 1825, in the state of Rio de Janeiro it is used as a medicine against diabetes. – According to POTT & POTT (1997), the aborigines used the sticky sap of "*D. obovata*" (see above) to make clothes waterproof.

Specimens examined: **Brazil**, Piauí, [K:] "common between Franqueira and Canariera" [correct are "Tranqueira" and "Canavieira"], [7°10' S, 41°48' W], (fr), Mar. 1839, **G. Gardner 2284** [syntypes of *D. velutina*: B (destroyed, photo F 4374 at MO, US), BM, F (fragm. ex B), G 3×, GH, K 2×, NY 2×, OXF, P 4×, W 2×]; – Ceará, Meruoca, Serra da Meruoca, [3°32' S, 40°27' W], capoeira (mata subhúmida), (fl female, fr), 24 Nov. 2001, **A. Fernandes s.n.** [EAC 2× n.s. (dig. photos)], "subarbusto; flor esverdeada"; – same area: Sitio do Meio, amb. arenoso (capoeira), (fl female, fr), 4 Dec. 2002, **A. Fernandes s.n.** [EAC n.s. (dig. photo)], "arvoreta ca. 4–5 m; flor feminina esverdeada"; – same data except for: (fl male), **s.n.** [EAC n.s. (dig. photo)], "arvoreta ca. 5 m; flor masculina esverdeada"; – Caucaia, Pedreira do Coité, [ca. 3°44' S, 38°40' W], (fr), 14 May 1962, **A. Fernandes s.n.** [EAC n.s. (dig. photo)], "arbusto"; – Fortaleza, Praia do Futuro por trás da cidade 2000, [3°46' S, 38°26' W], dunas, (fr), 20 Feb. 1996, **A.S.F. Castro s.n.** [EAC n.s. (dig. photo)]; – same area: arredores da barra do rio Cocó, [3°46' S, 38°26' W], matinha seca, (fr), 26 Feb. 1955, **A. Ducke 2429** [FHO (fragm.), IAN n.s., K, MG n.s., R, SP], "árvore ca. 4 m; fruto quase maduro, vermelho"; – Serra de Aratanha, lado de Maracanaú, parte inferior, [3°56' S, 38°38' W], (fl male), 22 Oct. 1954, **A. Ducke 2358** [IAN, K, R], "arbúsculo, corola brancacenta"; – same Serra: parte inferior, [ca. 3°59' S, 38°38' W], (fl female, yfr), 11 Jan. 1955, **A. Ducke 2400** [IAN n.s., K, NY, R, RB n.s. (dig. photo), SP]; – Município de Pacatuba, Reserva Ecológica do Roncador, sítio do Pitaguari [not located], [ca. 3°58' S, 38°37' W], serra, (fr), 28 Jul. 1979, **J. Elias de Paula & R.C. de Mendonça 1256** [HRCB n.s., MG n.s., UB n.s., W], "arbusto de folha coriácea, ramoso; fruto globoso, adiantado de cor verde amarelado"; – Baturité a Intans [= Itans], [4°25' S, 38°53' W], (st), 1860, **F. Allemão & M. Cysneiros s.n.** [R]; – Mun. Aiuaba, Dist. Aiuaba, Estação Ecológica de Aiuaba, Volta do Meio (roça do Sr. Anto. de Mel), 400 m, 6°37'06.7" S, 40°7'28.5" W, caatinga arbustivo arbórea; cristalino pré-cambriano; solo litólico, (fr), 9 Apr. 1997, **L.W. Lima-Verde et al. 644** [SPF n.s. (dig. photo)], "árvore 2 m; cálice verde; corola amarela"; – Serra de Araripe, [ca. 7°20' S, 40°1' W], (fl male), Oct. 1838, **G. Gardner 1512** [syntypes of *D. velutina*: BM, F, G 2×, GH, K 3×, NY, OXF, P 4×, US, W 2×], "a shrub about 4 feet high"; – "Araçá" / "Quebradas da Serra Azul – a 25 de ..." / "catingas fechadas e matas de sertão" [labels barely legible], (fl male, defl female), s.d., **F. Allemão & M. Cysneiros 964** [P, R 5×]; – Fazenda dos Mungubas [not traced], nas capoeiras, (fr), s.d., **F. Allemão & M. Cysneiros 965** [MG n.s., R 2×]; – without further data, (flbuds), s.d., **F. Allemão s.n.** [R]. – Rio Grande do Norte, Município Tibau do Sul, Santuário Ecológico de Pipa, Mata de Vassourinha, [6°14' S, 35°4' W], (fr), 5 Oct. 1999, **S.A. Santos 11** [PEUFR n.s. (dig. photo)], "arbusto ca. 4,5 m; fruto marrom escuro"; – Mun. Serra Negra do Norte, encosta Serra Negra do Norte, 160 m, [ca. 6°40' S, 37°24' W], (fr), 22 Jul. 1991, **M.A. Figueiredo et al. 284** [EAC n.s. (dig. photo)], "árvore" [the fruit on the sheet belongs to *D. hispida*]. – Paraíba, Agréste, Esperança, [7°1' S, 35°51' W], (fl female), 14 Sep. 1958, **J. Coêlho de Moraes 1871** [F, G, K 3×, MO, NY, S, U, US], "arbusto ramoso; com perianto esverdeado; o fruto colhido esta completamente desenvolvido (verde claro)". – Pernambuco, Mun. Triunfo, Boa Vista, próximo a cachoeira, [ca. 7°51' S, 38°6' W], (fl male), 16 Nov. 1999, **A.M. Miranda 3075** [RB n.s. (dig. photo)], "arbusto ca. 2 m; caule amarronzado; folhas levemente membranáceas; flores verdes"; – Triunfo, sítio Lagoa Nova, 1100 m, [7°50' S, 38°3' W], brejo de altitude, (yfr), 17 Jan. 1992, **E. Ferraz 61** [PEUFR n.s. (dig. photo)], "árvore ca. 8 m, de frequência elevada na área; frutos verdes"; – Arcoverde, Serra das Varas, [ca. 8°28' S,

37°4' W], (fr), 21 Aug. 1955, **A. Lima 55-2132** [FHO, INPA n.s.], "arv. med. ereta; frutos"; – Pesqueira, Serra de Ororubá, ca. 900 m, [ca. 8°20' S, 36°44' W], capoeira, (fl female), 22 Feb. 1962, **J. Mattos & N. Mattos 9787** [SP 2×], "árvore pequena"; – same area: (fl female), 23 Nov. 1962, **A. Lima 62-4034** [FHO], "arv. 3–5 m; fl. verde-amarela"; – Pesqueira, [8°22' S, 36°42' W], cerrado, (fl female), Feb. 1962, **P. Cavalcante 985** [FHO 3×, MG n.s.], "árvore 4–5 m; flor esverdeada"; – S. [São] Caitano, Tapiraim, encosta da serra, [8°25' S, 36°10' W], (fl female, fr), 24 Apr. 1966, **A. Lima 66-4529** [FHO 2×], "árvore 1,5–2 m; flores femininas verde"; – same data except for: (fl male), **66-4528** [FHO], "árvore 1,5–2 m; flores masculinas verde claro"; – Município de Bezerros, Parque ecológico de Serra Negra, 471 m, 8°12' S, 35°49' W, vegetação arbustiva-arbórea; solo argilo-arenoso de cor marrom escuro; beira da estrada, (fr), 8 Feb. 1996, **S.S. Lira & M. Oliveira 114** [PEUFR n.s., SPF n.s. (dig. photo)], "arbusto ca. 1,7 m; caule acinzentado; fruto imaturo verde; cálice verde"; – same area: solo arenoso com pedras, (fr), 12 Apr. 1995, **V.V. Henrique et al. 9** [PEUFR n.s., SPF n.s. (dig. photo)], "subarbusto ca. 2,5–4 m; caule acinzentado; folha verde claro na parte inferior e verde escuro na parte superior; frutos verde claro". – Bahia, Mun. de Itiúba, Fazenda Experimental da EPABA, 10°43' S, 39°50' W, estepe arbórea densa (caatinga), (yfr), 27 May 1983, **H.P. Bautista & G.C.P. Pinto 772** [BAH n.s., K, MBM, MG n.s., NY, RB n.s. (dig. photo)], "arvoreta ereta muito folhosa; frutos globosos com cálice persistente"; – Olindina, Fazenda Olhos d'Água, ás margens do Riacho-da-Barra próximo ao Rio Itapicuru, [ca. 11°21' S, 38°19' W], capoeira de mata, (yfr), 20 Jul. 1993, **O.B. Borges 23** [RB n.s. (dig. photo)], "arbusto de ± 1,5 m; folha coriácea"; – Ipirá, Fazenda Nova Fanela, ca. 2,5 km S de Ipirá, 278 m, 12°10'45" S, 39°46'12" W, mata ciliar, (fl male), s.d., **L.P. de Queiroz et al. 10602** [SPF n.s. (dig. photo)], "árvore ca. 10 m; folhas cartáceas; flores com cálice verde e corola creme-amarelada"; – Mun. de Feira de Santana, 11 km NW de Jaguara, Fazenda Monte Verde, 320 m, 12°04'58" S, 39°11'05" W, floresta estacional, (fr), 21 Jul. 1987, **L.P. de Queiroz et al. 1749** [CEN n.s., NY, HUEFS n.s., W], "arbusto ca. 2,5 m; folhas cartáceas; frutos cor de vinho com cálice persistente verde"; – same data except for: (flbuds female), **1752** [CEN n.s., NY, HUEFS n.s., W], "arbusto ca. 2,5 m; folhas subcartaceas; botões esverdeados"; – Anguera, Morro da Fazenda Retiro, 390 m, 12°9'49" S, 39°11'12" W, vegetação arbustivo-arbórea a arbórea; pasto na base do morro; orla da mata, (fr), 29 Apr. 1999, **F. França et al. 2699** [HUEFS n.s., SPF 2× n.s. (dig. photo), W], "arbusto 1,7 m; folha cartácea a coriácea, discolor; fruto imaturo verde"; – Ipecaetá, Fazenda Riachão, Serra Orobozinho, ca. 1 km da cidade, 12°20' S, 39°17' W, ocasional na capoeira, (fr), 14 Aug. 1985, **L.R. Noblick & C.G. Lôbo 4334** [K, HUEFS n.s., ICN n.s., W], "arbusto de ca. 3 m; frutos verdes, nascendo próximo as ramificações dos caules"; – Mun. de Feira de Santana, rodovia Feira – Rio de Janeiro, km 8, margem do rio Jacuípe, [12°20' S, 38°58' W], caatinga, (fr), 19 Feb. 1981, **A.M. de Carvalho et al. 584** [FHO, MG n.s.], "arbusto com ca. 2.5 m; folhas discolor; frutos imaturos verdes"; – [Município] Cachoeira, Vale dos Ríos, Paraguaçu e Jacuípe, trecho superior Rio Jacuípe, 40–120 m, 12°32' S, 39°05' W, (fr), 19 Feb. 1981, **G.P. do Cavalo 1090** [BAH n.s., HUEFS, NY], "arbusto ca. 2,5 m; folhas semicoriáceas, discolor; frutos carnosos, pilosos"; – same locality: mato do Rio Jacuípe, (fr), Aug. 1980, **G.P. do Cavalo et al. 557** [BAH n.s., HUEFS, NY], "árvore ca. 3 m; frutos globosos"; – Iaçu, Morro da Garrafa, 312 m, 12°45'18" S, 39°51'24" W, orla interna da mata da base, (yfr), 22 Feb. 1997, **E. de Melo et al. 2060** [HUEFS n.s., SPF n.s. (dig. photo), W], "arbusto 2,5 m; folha coriácea, discolor; fruto imaturo verde"; – Itatim, Morro do Agenor, encosta do Inselberg, 310–430 m, 12°43' S, 39°46' W, (fl male), 25 Feb. 1996, **E. de Melo et al. 1478** [CEN n.s., HUEFS n.s., RB n.s. (dig. photo), SPF n.s. (dig. photo), W], "arbusto 3 m; folhas discolores; flores com pétalas branco-amareladas"; – same area: 230–250 m, 12°42' S, 39°46' W, vegetação arbustiva com algumas árvores; solo arenoso-pedregoso, (fr), 29 Jun. 1996, **E. de Melo et al. 1622** [CEN n.s., HUEFS n.s., SPF n.s. (dig. photo), W], "árvore ca. 4 m; frutos imaturos verdes"; – Itatim, Morro da Pedra Grande, encosta do inselberg, 12°43'3" S, 39°45'37" W, (fr), 2 Jul. 2005, **A.O. Moraes et al. 20** [SPF n.s. (dig. photo)], "arvoreta ou arbusto ca. 3 m; folhas discolores coriáceas; fruto imaturo verde e fruto maduro viináceo"; – Itatim, Morro do Leão, base do Inselberg, 240 m, 12°43' S, 39°41' W, caatinga; solo arenoso, (fl male), 26 Oct. 1996, **F. França et al. 1924** [HUEFS n.s., SPF n.s. (dig. photo), W], "arbusto de ca. 1 m; flores com sépalas e pétalas verdes; anteras amareladas; botões com pilosidade branca"; – vicinity of Machado Portello [= Portela], [13°9' S, 40°45' W], (fr), 19–23 Jun. 1915, **J.N. Rose & P.G. Russell 19977** [NY, US]; – Santa Inês, na estrada em direção a BR 116, ca. 7,5 km após Sta. Inês, na Fazenda Monte Alegre, 508 m, 13°15'36" S, 39°53'19" W, caatinga, (fr), 25 Apr. 2002, **E.R. de Souza et al. 271** [HUEFS n.s., W], "arbusto ca. 3 m; folhas coriáceas, levemente discolores; frutos imaturos verdes"; – Maracás, Fazenda Cana Brava, 900–1000 m, 12°26' S, 40°25' W, [correct is: 13°26' S, 40°25' W], (fr), 31 Aug. 1996, **R.M. Harley & A.M. Giulietti 28227** [HUEFS, K, SPF n.s. (dig. photo), W 2×], "árvore ca. 3 m; folhas discolores verde-claras, na face inferior; sépalas verdes; fruto verde quando maduro; sementes castanhas com camada mucilaginosa; endosperma branco, doce; mesocarpo amarelo"; – trail Jaguaquara to Jequié, [ca. 13°40' S, 40°1'

W], (fr), 11 Jun. 1918, **H.M. Curran 408** [DS, GH, NY, UC]; – Jitaúna, saída para Jequié, [14°1' S, 39°57' W], transição de floresta com cacau para catinga, (yfr), 8 Mar. 1967, **R.P. Belém & R.S. Pinheiro 3382** [FHO, MG n.s., NY, UB], "arbusto de 3 m; frutos verdes"; – Boa Nova: Fazenda Cotermaia (proprietário Alipe Maia), entrada à esq., ca. 1,2 km E de Boa Nova, na estrada para Dario Meira, 14°22'25" N, 40°11'15" W, mata seca, (fr), 8 Mar. 2003, **P. Fiaschi et al. 1404** [CEPEC n.s., NY n.s., RB n.s. (dig. photo), SPF n.s. (dig. photo), W], "arbusto ca. 2,5 m; folhas discolores; frutos imaturos verdes, maduros pretos, com cálice persistente esverdeado"; – same data except for: **1428** [CEPEC n.s., NY n.s., SPF n.s. (dig. photo), W], "arbusto ca. 2 m; frutos imaturos verdes; cálice persistente verde-claro"; – Ilhéus, Campus da Universidade Estadual de Santa Cruz (UESC), km 16 da Rod. [Rodovia] Ilhéus/Itabuna (BR 415), arboreto, parcela n° 05, 40 m, 14°48'0" S, 39°10'0" W, solo argiloso, (fr), 25 Oct. 2001, **L.A. Mattos-Silva & B.R. dos Santos 4500** [NY], "arvorezinha ca. 2,6 m; folhas discolores; frutos imaturos amarelados; cálices verdes"; – Município de Ilhéus, Área do CEPEC (Centro de Pesquisas do Cacau), km 22 da Rodovia Ilhéus/Itabuna (BR 415), area do Arboreto, 50 m, [14°47' S, 39°12' W], Região de Mata Higrófila Sul Baiana, (fr), 5 Sep. 1983, **E.B. dos Santos & L.A.S. Barreto 54** [FHO, MG n.s.], "árvore 5 m × 20 cm diam.; frutos imaturos verdes, quando maduros arroxeados"; – same locality: (fl female, yfr), 7 Dec. 1976, **T.S. dos Santos 3121** [FHO, ICN n.s., MG], "arvorezinha 4–5 m; flores cremes e frutos verdes"; – same locality and collector: (fr), 17 May 1985, **3965** [SPF n.s. (dig. photo)], "árvore 10 m × 6 cm; frutos imaturos verdes"; – same locality: (fr), 2 Apr. 1981, **J.L. Hage 582** [FHO, MG n.s.], "árvore 5 m × 15 cm; frutos imaturos, verdes"; – same locality and collector: (fl female), 5 Nov. 1987, **2184** [SPF n.s. (dig. photo)], "àrvore 5 m × 15 cm; flores em botões esverdeados"; – same locality: (fl male), 23 Oct. 1979, **J.L. Hage & E.B. dos Santos 347** [FHO 2×, MG 2× n.s.], "árvore 4 m × 10 cm; flores em botões, cremes e frutos, imaturos verdes"; – same locality and collectors: (fl male), 11 Aug. 1981, **J.L. Hage & E.B. dos Santos 1171** [FHO, MG n.s.], "árvore 7 m × 15 cm; flores esverdeadas"; – Município de Sta. Cruz de Cabrália, Estação Ecológica do Pau-Brasil, ca. 16 km W de Porto Seguro, parcela no. 38 do arboreto, [16°23' S, 39°8' W], Região de Mata Higrófila Sul Baiana, (fr), 3 Apr. 1979, **L.A. Mattos Silva et al. 331** [FHO], "arvorezinha 5 m; frutos imaturos, verdes e sem pelos"; – same area except for: (fr), 23 Aug. 1983, **F.S. Santos 18** [SPF n.s. (dig. photo)], "árvore ca. 4 m; frutos marrom-escuro, quando maduros preto". – Goiás, Catalão, Fazenda Degredo, atrás da Serraria, [not located; ca. 18°14' S, 47°56' W], mata secundária, (fl female, fr), 1 Jan. 1983, **A.M.S.F. Vaz 354** [RB n.s. (dig. photo)], "arbusto; frutos verdes; cálice verde". – Minas Gerais, Cristália, Faz. Curral Velho, 600 m, [16°43' S, 42°52' W], cerrado sensu strictu, (fr), 24 Apr. 1991, **M.G. Carvalho & S.T. Silva 113** [BHCB n.s., W], "árvore 4 m"; – Berilo, UHE Irapé, [16°47' S, 42°40' W], cerrado, (fr), 13 Feb. 2001, **E. Tameirão Neto 3197** [BHCB n.s., NY]; – Diamantina, [18°15' S, 43°36' W], (fl female), Nov. 1915, **D. Vincent 4523** [L]; – Uberlândia, Estação Ecológica do Panga [part of the former Fazenda Santa Luzia], [19°12' S, 48°18' W], mata mesófila semidecídua, (st), 27 Jul. 1990, **G.M. da Araújo 730** [UEC], "árvore 7 m"; – Nova Ponte, [19°8' S, 47°41' W], floresta semidecídual, (fl male), 3 Nov. 1996, **E. Tameirão Neto 2162** [BHCB n.s., W]; – Cordisburgo, Gruta de Maquiné, entre 750–800 m, [19°7' S, 44°23' W], mata estacional-decidual, formação carstica, local úmido, (fr), 18 Apr. 1998, **W.A. Teixeira s.n.** [BHCB n.s., W], "arbóreo; frutos 1.5–3.0 cm diam., arroxeados"; – Horto Florestal de Paraopeba, [19°17' S, 44°24' W], margem do corrego, (fl female), 2 Oct. 1958, **E.P. Heringer 6622** [K, R, SPF], "árvore pequena"; – Paraopeba, Gruta da Lapa, [ca. 19°17' S, 44°24' W], mata de calcário, (fr), 27 Mar. 1984, **A. de Mattos Filho & C.T. Rizzini 1628** [RB n.s. (dig. photo)], "árvore ca. 5 m, 15 cm diâmetro"; – Santana do Riacho, Morro da Pedreira, [ca. 19°10' S, 43°41' W], mata (borda), (fr), 24 May 1989, **J.R. Stehmann et al. s.n.** [BHCB n.s., W], "árvore ca. 6 m; frutos vináceos "; – Rio Doce, Figueira [= Governador Valadares], Fazenda Ibituruna [not located], [ca. 18°53' S, 41°55' W], no descampado artificial, (fr), 13 Sep. 1930, **J.G. Kuhlmann 332** [RB n.s. (dig. photo), W], "árvore pequena; fruto negro-purpúreo"; – same data except for: **352** [RB n.s. (dig. photo), SP]; – Aimorés, estrada Aimorés a Tabaúna, km 10, [ca. 19°31' S, 41°17' W], pasto, (fr), 20 Mar. 2007, **A.A. da Luz 375** [CVRD n.s., W], "arbusto 5 m; fuste 1,5 m, cilíndrico; CAP fuste 20 cm; diâmetro da copa 2 m; casca áspera; descamação ausente; exsudação: seiva, incolor; fruto imaturo verde, maduro roxo"; – Aimorés, Instituto Terra, estrada Tabaúna, km 11, [ca. 19°30' S, 41°10' W], pasto, (fr), 24 Apr. 2001, **A.A. da Luz 3** [CVRD n.s., W 2×], "árvore 5 m; fuste 2 m, cilíndrico; CAP do fuste 35 cm; diâmetro da copa 4 m; casca áspera; exsudação: seiva, incolor; descamação ausente; fruto imaturo verde, maduro roxo"; – ad Lagoa Santa, [19°38' S, 43°53' W], (fl male), 28 Nov. 1863, **E. Warming s.n.** [C], "arbor silvestris; flores virescentes; corolla subsericea"; – further specimens from this locality and collector: (fr), 1 Sep. 1863, [P]; (fl male), Oct. 1864, [US]; (fl male, yfr), 5 Dec. 1865, [C]; (fl male), s.d., [P]; derrumbada no. 3, (st), s.d., **16** [C]; (fr), 17 Mar. 1865, **909** [C]; – Vespasiano, adjacente à Lavra de Cia. de Cimento Portland, Itaú, [19°42' S, 43°57' W], afloramento calcario, (fr), Dec. 1990, **M.A. Rollo 25** [SPF 2×], "árvore, médio porte, 7–8 m"; – Pindaré, Ribeirão das

Neves, [19°47' S, 44°6' W], mata, (fl male), 17 Nov. 1980, **M. Grandi & T.S.M. Grandi 466** [BHCB], "árvore; flores brancas"; – Belo Horizonte, Campus da UFMG, 19°52' S, 43°58' W, cultivada, (fl female), 17 May 1999, **J.A. Lombardi & P.O. Morais 2848** [BHCB n.s., W 2×], "árvore ca. 10 m; folhas cartáceas; flores verdes; frutos imaturos verdes ou arroxeados"; – same locality: (flbuds female), 8 Aug. 1980, **J.A. Oliveira 543** [BHCB]; – Belo Horizonte, Parque Betânia, [19°58' S, 43°59' W], mata mesófila, (fr), 5 Jun. 1997, **C.V. Mendonça-Filho 1941** [SPF n.s. (dig. photo)], "arbóreo 4 m"; – Alberto Flores, Brumadinho, sítio Irarema, [ca. 20°8' S, 44°13' W], mata de interior semidecídua, (fr), May 1989, **L.V. Costa 240** [BHCB], "árvore 5,5 m"; – Serra de Ouro Branco, [20°30' S, 43°40' W], dans le campo [data from Glaziou 1905–1913], (fr), 1878–1879, **A.F.M. Glaziou 11173** [C 2×, K, P]; – Campo Abril [not located; Glaziou 1905–1913: Serra de Ouro Branco], [ca. 20°30' S, 43°40' W], dans le campo, (fr), 1884, **A.F.M. Glaziou 15200** [C, P]; – Oliveira, [20°41' S, 44°49' W], mata mesófila, (fr), 11 Feb. 1999, **F. Campos BHZB 2142** [SPF n.s. (dig. photo)], "arbóreo; frutos verdes"; – Monte Belo, Fazenda Lagoa, Corredor de Fauna I, [ca. 21°19' S, 46°22' W], (fr), 20 Jan. 1994, **S.B. Souza 1005** [RB n.s. (dig. photo)], "frutos verdes"; – same locality: (fr), 28 Feb. 1997, **S.B. Souza 1073** [RB n.s. (dig. photo)]; – Lavras, [21°14' S, 44°59' W], encontrada nos solos erodidos, à beira das barrancas, (fl male), 18 Dec. 1939, **E.P. Heringer 268** [SP], "árvore pequeno"; – Mun. Lima Duarte, distrito de Conceição do Ibitipoca, estrada para Santana do Garambel, 1128 m, 21°42'17" S, 43°56'42" W, mata de galeria; solo arenoso; ambiente úmido; beira da estrada local antropizado, (fr), 9 May 2002, **R. Marquete et al. 3248** [HRB n.s., IBGE n.s., RB n.s. (dig. photo)], "árvore semi-heliófita 6 m; tronco com casca lisa, cor acinzentada com liquens; folhas cartáceas, discolores verdes, opacas em ambas as faces; frutos imaturos de cor verde"; – Lima Duarte, arredores do P.E. do Ibitipoca, RPPN do Hotel Serra do Ibitipoca, UTM 23K 0612720/7599056, [21°42' S, 43°54' W], (fr), 3 Feb. 2002, **F.S. Araújo & A.S.M. Valente 189** [BHCB n.s., CESJ n.s., ESA n.s., RB n.s. (dig. photo)]; – Caldas, [on some labels:] Chacara de Aug. Weskin [?], [21°56' S, 46°23' W], (fl female, fr), 30 Apr. 1866, 25 Feb. 1867, 21 Dec. 1867, 18 Apr. 1868, **A.F. Regnell ser. III 1516** [C 2×, K 2×, LE n.s., M, P 3×, R, S 3×, UPS 2×, US], [a mix-up of specimens; at least partially gathered by S.E. Henschen]; – margem do Rio Grande [not located], mata ciliar, (fl male), 1997, **A.E. Brina s.n.** [BHCB n.s., W]; – without further data: in collibus siccis, (flbuds female), 1824, **L. Riedel s.n.** [NY]; – (fr), 1844, **H.A. Weddell s.n.** [P]. – Espirito Santo, Linhares, área experimental da Reserva Natural Vale, estrada Flamengo, km 0,4, arboreto parcela 127, [ca. 19°7' S, 40°0' W], área plantada, (fl male), 6 Feb. 2008, **D.A. Folli 5926** [CVRD n.s., W 2×], "árvore 5 m; fuste 1,8 m, cilíndrico; CAP fuste 28 cm; diâmetro da copa 3 m; casca áspera; descamação ausente; exsudação: seiva, incolor; botão e flor verde"; – Sta. Cruz, [19°56' S, 40°9' W], (fl male), 13 Dec. 1945, **J.G. Kuhlmann 6669** [RB n.s. (dig. photo), SP], "árvore; flores esverdeadas"; – Piúma, ca. 3 km S do Morro do Aghá, Rodovia ES-60 (Vila Velha a Marataízes), 20°52' S, 40°46' W, restinga baixa e densa (arvoretas maiores até 4 m alt.), (yfr), 25 Feb. 1988, **J.R. Pirani et al. 2456** [NY, SPF n.s., W], "arvoreta ramosa 3 m, heliófila; folhas escassas, verde-claras (novas), lustrosas na face superior; frutos imaturos verde-lustrosas"; – same data except for: (fr), **2459** [MO, NY, SP n.s., SPF n.s. (dig. photo), W], "arvoreta 4 m, heliófila; folhas rígido-cartáceas, verde-escuras e lustrosas na face superior, claras e opacas na inferior; frutos vináceos com cálice verde"; – Marataízes, [21°2' S, 40°50' W], restinga, (yfr), 3 Nov. 1972, **L. Krieger et al. CESJ 11874** [ESA n.s. (dig. photo), RB n.s. (dig. photo), SPF n.s. (dig. photo)], "arbusto; frutos novos"; – same data except for: **CESJ 11876** [ESA n.s. (dig. photo)]; – Itapemirim, próxima a estrada de Marataízes para Lagoa do Siri, 4 km após Marataízes, [21°7' S, 40°51' W], mata de restinga, (fr), 13 May 1991, **D.A. Folli 1351** [CVRD n.s., NY, W 2×], "árvore 3 m; fuste 1,5 m, cilíndrico; CAP do fuste 25 cm; DAP 8 cm; diâmetro da copa 3 m; casca áspera; descamação ausente; exsudação: seiva, incolor; fruto imaturo verde escuro, maduro roxo"; – Município de Presidente Kennedy, Praia das Neves, estr. Praia das Neves para o porto do Rio Itabapoana, [21°17' S, 40°58' W], restinga arbustiva do segundo cordão arenoso, (fr), 18 May 1994, **C. Farney et al. 3362** [RB n.s. (dig. photo)], "arbusto; folhas verdes discolores; frutos imaturos verdes; frutos em maturação vináceos". – Rio de Janeiro, Bom Jesus do Itabapoana/Itaperuna, área da linha de transmissão da PCH Pirapitinga, 21°7' S, 41°43' W, fragmentos de floresta estacional em sucessão secundária, ocorrentes em cadeia de morros, separados por grandes extensões de pasto e capoeira, (fr), 16 Jul. 2008, **R.A.X. Borges et al. 918** [MBM n.s., RB n.s. (dig. photo), SPF n.s.], "arvoreta 5 m; folhas verde-escuras, levemente discolores; frutos vermelhos, nigrescentes"; – Município de São João da Barra, Restinga de Iquipari, [21°44' S, 41°2' W], (fr), 31 Mar. 2003, **M.C. Gaglianone 75/61** [RB n.s. (dig. photo)]; – Mun. de Quissamã, próximo a Lagoa Preta, [22°5' S, 41°23' W], restinga arbustiva alta na transição com comunidade de Clusia, (fl male), 29 Oct. 1994, **C. Farney et al. 3415** [RB n.s. (dig. photo)], "arbusto 4 m; folhas verdes discolores; flores com cálice verde; corola alvo/esverdeada"; – Município de Carapebus, Parque Nacional da Restinga de Jurubatiba, Restinga de Carapebus, [22°14' S, 41°35' W], restinga, (fl female), 25 Oct. 2004, **M.G. Santos 1825** [RB n.s. (dig.

photo)], "árvore ca. 2,5 m; sépalas verde e pétalas creme"; – same locality: estrada para Praia de Carapebus, (fr), 12 Apr. 2000, **M.G. Santos et al. 1407** [RB n.s. (dig. photo), W], "arvoreta ca. 3 m; frutos imaturos púrpura escuros quando maduros"; – Município de Teresópolis, Santa Rita, [22°20' S, 43°2' W], orla da mata, (fr), 4 Jul. 1945, **S. Tato s.n.** [RB 2×], "arvorezinha ate 2,5 m; fruto castanho-avermelhado"; – Sto. Antonio, prés de Petropolis [GLAZIOU (1905–1913): "Petropolis, à Santo Antonio], [ca. 22°31' S, 43°11' W], (fl male + female), 9 Dec. 1878, **A.F.M. Glaziou 11164** [B, BR, C, G 2×, K, LE n.s., NY, P 2×], "arbrisseau; fl. rousses"; – same area: (fr), 8 Jul. 1874, **A.F.M. Glaziou 7748** [K, P 2×]; – Imbetiba, près de Macahé [= Macaé], [22°23' S, 41°47' W], (fl male), 29 Dec. 1891, **A.F.M. Glaziou 19613** ("16913") [BR, C, G, LE n.s., P 4×], "arbuste"; – Mun. Macae, Praia das Pedrinhas, prox. as casas, [22°25' S, 41°50' W], restinga, (fr), 9 Feb. 1981, **D. Araujo & N.C. Maciel 4221** [GUA n.s., RB n.s. (dig. photo)], "arbusto ca. 4 m; frutos verdes"; – Rio das Ostras, Balneário das Garças, [22°26' S, 41°51' W], (fr), 28 Nov. 1999, **H. do N. Braga & R.N. Damasceno 30** [RB n.s. (dig. photo)], "arbusto semiciófilo; folhas coriáceas; frutos maduros negros"; – same locality: (fr), 18 Apr. 1999, **H. do N. Braga & R.H. dos Santos 199** [RB n.s. (dig. photo)], "arbusto semiciófilo; folhas cartáceas; frutos maduros negros"; – same locality: solo arenoso, (fr), 20 Apr. 1999, **R.N. Damasceno 888** [RB n.s. (dig. photo)], "arbusto heliófilo; folhas cartáceas, discolores; frutos maduros negros"; – same locality: restinga, (fr), 10 Jun. 2000, **R.N. Damasceno & H. do N. Braga 2248** [RB n.s. (dig. photo), W], "arbusto heliófilo; folhas discolores, coriáceas; frutos maduros negros"; – Rio das Ostras, Balneário Morada das Garças, última quadra antes do Mar do Norte, [22°26' S, 41°51' W], mata seca de restinga arbórea sobre solo arenoso (dunas), (fr), 18 Feb. 2003, **R.D. Ribeiro & H.C. de Lima 2** [RB n.s. (dig. photo)], "árvore pequena 3–4 m, muito comum; frutos vermelhos enegrecidos"; – Município Rio das Ostras, restinga da Praia Virgem, [22°28' S, 41°52' W], (fr), 5 Jun. 1999, **H. do N. Braga 363** [RB n.s. (dig. photo)], "arbusto ca. 1,8 m, heliófilo, comum; folhas fortemente coriáceas, discolores; frutos maduros negros muito vistosos"; – same locality: (fl female), 1 May 1999, **R.N. Damasceno 984** [RB n.s. (dig. photo)], "arbusto ca. 2 m, heliófilo; folhas fortemente coriáceas, discolores; flores esverdeadas"; – same data except for: (fr), 3 Jun. 1999, **1025** [RB n.s. (dig. photo), W], "arbusto ca. 1,5 m, heliófilo; folhas coriáceas discolores; frutos imaturos verdes e maduros negros"; – Rio das Ostras, loteamento do Mar do Norte, Rodovia Amaral Peixoto, km 163, [ca. 22°28' S, 41°52' W], (fr), 18 Feb. 2003, **H.C. de Lima et al. 6054** [RB n.s. (dig. photo)], "arbusto ± 2 m; frutos imaturos verdes"; – Fazenda Itapebussus, [22°29' S, 41°53' W], mata de tabuleiro com dossel médio de 12 m de altura, raras árvores emergentes, (fr), 1 Jul. 2004, **A. Oliveira & D. Oliveira 892-B** [RB n.s. (dig. photo)], "árvore; frutos maduros escurecidos"; – same area and collector: em áreas de transição entre restinga e formação de morrote, (fr), Jul. 2004, **948** [RB n.s. (dig. photo)], "árvore"; – Cabo Frio, Unamar, Tamoios, estrada da Gargoá, acesso á Florestinha, [22°38' S, 42°1' W], restinga arbórea, (fr), 22 Feb. 2006, **R.D. Ribeiro et al. 595** [RB n.s. (dig. photo)], "árvore 10 m; tronco enegrecido; folhas discolores, frutos verdes"; – Rio das Ostras, ca. 1 km S da cidade, 22°42' S, 42°0' W, restinga arbórea perturbada, (fr), 14 Mar. 2004, **J.G. Jardim et al. 4217** [RB n.s. (dig. photo), SPF n.s. (dig. photo)], "árvore ca. 10 m; folhas verdes com a face inferior mais clara; cálice verde; frutos imaturos verdes"; – Cabo Frio, Tamoios, Campos Novos, Estação Radiogoniométrica da Marinha, estrada do Anel Viário, 14 m, 22°42'30,4" S, 42°00'26,6" W, (fr), 17 Jun. 2009, **T.A. Amorim et al. 115** [RBR 2× n.s. (dig. photos)], "árvore ca. 6 m; frutos maduros vinho escuro"; – Município de Armação de Búzios, Praia Rasa, [22°44' S, 41°57' W], floresta de restinga, (fr), 24 Oct. 2000, **C. Farney & D.S. Fernandes 4286** [K n.s., MBM n.s., RB n.s. (dig. photo), SP n.s.], "arvoreta 5 m; folhas verdes, discolores; flores em botões esverdeadas"; – Tartaruga, 22°43'00" S, 41°57'00" W, [correct is: 22°45' S, 41°54' W], vegetação arbórea sobre maciço costeiros, (fr), 16 Feb. 2004, **H.G. Dantas & R.D. Ribeiro 107** [RB n.s. (dig. photo), W]; – praia de Manguinhos, [22°46' S, 41°55' W], restinga, (fr), 27 Mar. 2000, **A.E.S. Oliveira & D.S. Fernandes 97** [RB n.s. (dig. photo)], "arbusto ca. 2,5 m; ramos marrons; folhas verdes discolores; frutos verdes imaturos; com muitas formigas, especialmente nos frutos"; – Praia Gorda, 22°43'9" S, 41°58' W, [correct is: 22°46' S, 41°53' W], encontrada tanto na restinga como na área antrópica adjacente, (fr), 29 Sep. 2003 [RB: 29 Aug. 2003], **H.G. Dantas et al. 292** [RB n.s. (dig. photo), W]; – same locality: restinga arbustiva arbórea, (fr), 4 Aug. 1999, **D. Fernandes & A. Oliveira 251** [RB n.s. (dig. photo)], "arbusto; folhas verdes escuras, discolores; fruto vináceo"; – same locality: (st), May–Jul. 1999, **A. Lobão s.n.** [RB n.s. (dig. photo)]; – same locality: (fl male), 22 Oct. 1998, **A. Lobão & D. Fernandes 356** [RB n.s. (dig. photo)], "arvoreta; folhas discolores, verdes, bastante pilosas; botões com cálice verde e corola alva"; – same locality: (fr), 18 Aug. 1998, **A.Q. Lobão et al. 338** [RB n.s. (dig. photo)], "arvoreta ± 2 m; folhas verdes discolores; frutos imaturos verdes e maduros vináceos"; – same locality: (fr), 22 Oct. 1998, **A.Q. Lobão et al. 357** [RB n.s. (dig. photo)], "arvoreta; folhas discolores verdes, bastante pilosas; botões com cálice verde e corola alva"; – Município de Armação de Búzios, Serra das Emerenças, vertente para Praia de Tucuns, [22°47' S, 41°55' W], mata de encosta, (fr), 24 Jun. 1999,

C. Farney et al. 3919 [K n.s., MBM n.s., RB n.s. (dig. photo), SP n.s.], "arvoreta 4 m; folhas verdes, discolores, face inferior levemente ferrugínea; frutos imaturos verdes"; – Município de São Pedro da Aldeia, Morro da Farinha, à margem da Lagoa de Araruama, [22°50' S, 42°10' W], veg. arbustiva em solo arenoso, (fr), 1 Jun. 1989, **D.S.D. Araújo & H.C. de Lima 8984** [GUA n.s., RB], "arbusto ca. 3 m; heliófilo; frutos vermelho-escuros"; – entre São Pedro dos Indios et Araruama, [ca. 22°51' S, 42°10' W], (fl male), 10 Jul. 1877, **A.F.M. Glaziou 11172** [C, K, P], "abrisseau; fl. verdâtres"; – Município de Cabo Frio, área da C.I.A. Salinas Perynas, próximo a praia do sudoeste, [22°54' S, 42°4' W], restinga arbustiva alta; nas bordas da restinga arbustiva fechada, (fr), 18 Mar. 1989, **C. Farney & M. Pereira 2273** [RB n.s. (dig. photo), W], "arbusto frequente; folhas sub-coriáceas discolores verdes; frutos maduros esverdeados; cálice verde"; – Araruama, Praia Seca, anterior a Lagoa da Pernambuca e posterior a vegetação arbustiva densa de pós praia, 22°56'10" S, 42°17'38" W, restinga arbórea, (fr), 10 Jul. 2008, **A.C.S. Cavalcanti & J. Caruzo 195** [K n.s., MBM n.s., RB n.s. (dig. photo), SPF n.s.], "árvore ca. 4 m; ramos amarronzados em tom escuro; folhas levemente coriáceas, discolores de face abaxial mais clara e adaxial bem escura; frutos esverdeados"; – Município de Saquarema, Restinga de Massambaba, próximo á praia de Itaúna, [22°55' S, 42°20' W], crescendo na duna [restinga], (fr), 5 Aug. 1986, **C. Farney & E.L. Costa 1139** [GUA n.s., RB n.s. (dig. photo)], "subarbusto 1 m, heliófilo; folhas discolores verdes; frutos imaturos vináceos"; – Reserva Ecológica Estadual de Jacarepiá, [22°56' S, 42°24' W], mata de restinga, (fl female), 29 Oct. 1991, **C. Farney et al. 2781** [GUA n.s., RB n.s. (dig. photo)], "arvoreta 4 m; folhas verdes, discolores; flores esverdeadas"; – Maricá, [22°55' S, 42°49' W], restinga, (fr), 21 Jun. 1988, **A. Souza et al. 2230** [R], "árvore; frutos comestíveis"; – same locality: (yfr), Mar. 1989, **A. Souza et al. s.n.** [R], "arbusto ± 2 m; frutos escuros"; – Município de Maricá, Barra de Maricá, [22°57' S, 42°51' W], restinga aberta a arbustiva, (fr), 13 Jan. 1983, **D.S.D. Araújo et al. 5387** [GUA n.s., NY], "arbusto semi-decumbente; frutos verdes"; – same locality: (fr), 5 Mar. 1985, **V.L.G. Klein et al. 242** [RB n.s. (dig. photo), W], "arbusto escandente [?]; folhas verdes; frutos verdes vinosos nas extremidades quando imaturos e totalmente vermelhos quando maduros"; – Itaipuaçú, rua transversal a rua 82, [22°58' S, 42°56' W], restinga próxima à praia; próximo a beira da estrada de barro, (fl female, fr), 25 Feb. 1996, **R.C. Lopes 69** [RB 2× n.s. (dig. photos), SPF n.s. (dig. photo)], "arbusto ca. 2,5 m; tronco estriado cinza; ramo jovem piloso e adulto glabro; frutos verdes"; – same locality, date, and collector: **70** [RB 2× n.s. (dig. photos), W], "arbusto ca. 2,5 m; tronco estriado cinza; flores masculinas e botões"; – **71** [RB 2× n.s. (dig. photos), W], "arbusto ca. 2,5 m; tronco estriado cinza; poucas flores femininas; fruto jovens verdes"; – **72** [RB 2× n.s. (dig. photos)], "arbusto ca. 2,5 m; tronco estriado cinza; flores masculina e botão em abundância"; – Praia de Itacoatiara, [22°58' S, 43°2' W], (fl female), 21 Oct. 1982, **J.G. da Silva s.n.** [R]; – Jurujuba Bay, [22°56' S, 43°7' W], (fr), s.d., **J. Miers 3709** [syntype of *D. velutina*: BM], "purple berry"; – Jardim Botânico do Rio de Janeiro, Seção V, Canteiro B, [22°58' S, 43°13' W], cultivado, (st), 1991, **R. Fuks s.n.** [RB n.s. (dig. photo), W]; – same place: (fl female), 1 Jun. 1999, **C.G. Pinto et al. 86** [RB n.s. (dig. photo), W], "árvore; folhas cartáceas, discolores verdes; frutos imaturos verdes"; – Recreio dos Bandeirantes, 30 km W of Rio de Janeiro, [23°1' S, 43°28' W], on hill in restinga, (fr), 3 Jul. 1967, **J.C. Lindeman & J.H. de Haas 5566** [U], "small tree, 4 m tall, 8 cm diam.; fruit black, silky". – Mato Grosso do Sul, Serra de Maracaju, km 90 da estrada de Bela Vista, [ca. 21°33' S, 56°10' W], mata seca, (fl male), 23 Nov. 1963, **J. Correa Gomes Jr. 1484** [G 2×, MBM, SP 2×, UB], "arvoreta 2 m; flor creme; raro". – São Paulo, Mun. Teodoro Sampaio, Trilha da Lagoa Verde, Pq. Estadual Morro do Diabo, [22°30' S, 52°20' W], (fr), 3 Jun. 1994, **G.D. Casa s.n.** [UEC], "arbustivo 2 m; fruto maduro vinho"; – R.E. Morro do Diabo, 410 m, [22°30' S, 52°20' W], (fr), 24 Apr. 1985, **J.B. Baitello & O.T. Aguiar 9123** [F], "frutos verdes"; – Matão, [ca. 21°35' S, 48°23' W], campo, (fr), 14 May 1949, **J. Corrêa Gomes Jr. 363** [MG n.s., RB n.s. (dig. photo), W], "árvore 3–4 m; fruto cor de vinho"; – Dourado, Morro Chato, Rio Jacaré-Pepira, [22°11' S, 48°18' W], floresta riparia, (st), 14–18 Jun. 1993, **L.C. Bernacci et al. 34893** [UEC], "árvore, estéril"; – São João da Boa Vista (21°55' S, 47°15' W), estrada secundária da Rodovia São João da Boa Vista – Vargem Grande, ca. 8 km de São João, [21°55' S, 46°52' W], (fr), 21 Mar. 1994, **A.B. Martins et al. 31518** [SPF n.s. (dig. photo), UEC, W], "arvoreta ca. 5 m; frutos negros"; – Serra de Caracol, [ca. 22°2' S, 46°38' W], in margine silva, loco sicco, (fl male), 5 Dec. 1875, **H. Mosén 1446** [P, S], "arbor minor ramis ramulorum et foliorum dispositione disticha complanatis, divaricatis; folia chartacea plana supra obscure viridia lucida nervis planis, subtus pallidiorum opaca nervis prominulis; calyx subovoideus [verso:] vel elliptoideus ad medium 3-fidus lobis late ovatis breviter et abrupte acuminatis, viridis"; –without further data, (fl female), 30 Dec. 1873, **H. Mosén 1446** [S 2×]; – Espírito Santo do Pinhal, [ca. 22°11' S, 46°45' W], mata, (fl male), 28 Nov. 1896, **C. Novaes 919** [SP n.s. (dig. photo)]; – Município de Agudos, Fazenda Santa Rita [Fazenda Santa Rita de Cássia (Agudos-Borebi)], [22°33' S, 49°1' W], borda da mata, (fr), 17 Jan. 1997, **P.F. Assis [Camargo] et al. 349** [SP n.s. (dig. photo)], "arbusto 3 m; caule semi-rugoso; folhas cartáceas; fruto verde

e quando jovem apresenta um indumento ferrugíneo" [see CAMARGO 1999]; – Botucatu, [ca. 22°53' S, 48°27' W], mata de encosta, (fr), 1990, **W. Ribeiro s.n.** [SP n.s. (dig. photo)]; – same area: Fazenda São João, [ca. 22°53' S, 48°27' W], mata, (fr), 16 Mar. 1988, **J.L.C. Gabriel s.n. (HRCB 10559)** [HRCB n.s. (dig. photo)], "árvore 5 m; frutos roxos, comestível"; – Anhembi, Sítio Ribeirão Bonito, 22°48'43,5" S, 48°12'51,6" W, pasto, (fr), 22 Mar. 1994, **K.D. Barreto et al. 2202** [ESA n.s. (dig. photo), SPF n.s. (dig. photo)], "árvore 3 m; frutos imaturos verdes"; – Município de São Pedro, Cachoeira da Peroba, próximo ao rio, abaixo da 2a. cachoeira, 22°32'15" S, 47°56'20" W, floresta mesófila semidecídua de encosta que recobre a frente de um trecho de cuesta basáltica, (fr), 30 Jan. 1992, **S. Gandolfi et al. s.n.** [ESA n.s. (dig. photo)], "planta 4 m; frutos verdes"; – Município de Ipeúna, Rio Passa Cinco, [22°30' S, 47°40' W], remanescente florestal, (st), s.d., **R.R. Rodrigues & J.A. Zandoval 36** [ESA n.s. (dig. photo)]; – Município de Piracicaba, Mata do Sitio São Luis, 22°33'11,7" S, 47°39'15,6" W, mata mesófila semidecídua; borda, (fr), 5 Jan. 1994, **K.D. Barreto et al. 1721** [ESA n.s. (dig. photo)], "árvore ca. 4 m; frutos imaturos verdes"; – Godinho, 22°39'45,8" S, 47°39'35,7" W, borda de mata ripária, (fr), 9 Feb. 1994, **K.D. Barreto et al. 1997** [ESA n.s. (dig. photo), SP n.s.], "árvore 4 m; frutos imaturos verdes"; – Fazenda Samambaia, [ca. 22°45' S, 47°40' W], margem de campo úmido, (fr), 12 Oct. 1997, **R.R. Rodrigues s.n.** [ESA n.s. (dig. photo)], "arvoreta 6 m; frutos maduros vináceos"; – Amparo, Monte Alegre do Sul, Fazenda Nossa Senhora da Encarnação [located in the Bairro dos Francos], [22°38' S, 46°42' W], (fl male, fr), 5 May 1942, **E. Kuehn & M. Kuhlmann 1226** [SP 2× n.s. (dig. photo)]; – Monte Alegre do Sul, Fazenda Benati, [ca. 22°40' S, 46°41' W], (fr), 17 Mar. 1995, **L.C. Bernacci et al. 1346** [HRCB n.s., IAC n.s., SPF n.s. (dig. photo), UEC], "arvoreta ca. 3 m; frutos imaturos"; – Estação Experimental Monte Alegre, [22°42' S, 46°40' W], região montanhosa, (fr), 15 Jun. 1994, **L.C. Bernacci et al. 369** [IAC n.s., SP n.s. (dig. photo)], "arbórea 7 m; frutos maduros negros"; – Monte Alegre do Sul, Estação Experimental do IAC, [22°42' S, 46°40' W], (fl female), 20 Oct. 1950, **J.A. Cunha 77** [FHO (fragm.), IAC n.s., W]; – Município de Campinas, Fazenda São Vicente, [ca. 22°50' S, 47°10' W], mata mesófila semidecídua; próximo à borda da mata, (st), 8 Aug. 1990, **L.C. Bernacci 25920** [ESA n.s. (dig. photo), UEC, W], "arvoreta ca. 3 m, estéril"; – Campinas, Fazenda Santa Elisa (Instituto Agronómico), [ca. 22°50' S, 47°10' W], cultivado, (fr), 21 Jan. 1987, **A. Krapovickas & C.L. Cristóbal 40982** [A, CTES, LIL n.s. (dig. photo)], "arbolito 3–4 m"; – Parque Valença, Bosque Ferdinando Tilli, [22°56' S, 47°11' W], (fr), 8 Mar. 1995, **D. Santin & R. Cielo Filho 33702** [UEC]; – bosque de Jequitibás, [MATTHES et al. 1988: 652–681 m, 22°55' S, 47°3' W], (fl male), 15 Jun. 1978, **L.A.F. Matthes 10077** [E, UEC n.s.], "arvoreta ate 6 m; flores creme, externamente castanhas"; – same bosque: (fr), 10 Jun. 1946, **A.P. Viégas s.n. (IAC 8074)** [ESA n.s. (dig. photo), FHO (fragm.), IAC n.s., IAN, SP n.s. (dig. photo), W]; – Valinhos, Estação Experimental de Valinhos (IF), [22°58' S, 47°1' W], (fl male), 6 Oct. 1983, **S. Gandolfi 15626** [ESA n.s. (dig. photo), UEC n.s.], "árvore 3,5 m"; – Itatiba, Sítio Moinho Velho, ca. 800 m, [ca. 23°0' S, 46°50' W], mata atlântica, (fr), 20 Apr. 2004, **M.A. Pizo 65** [HRCB n.s., RB n.s. (dig. photo)], "árvore; frutos maduros vinho"; – Itatiba, Quilombo, [23°1' S, 46°51' W], (fl male), 17 Jun. 1936, **E. do Amaral s.n.** [SP n.s. (dig. photo)]; – Mun. Joanópolis, rodovia para Montes Verdes, [ca. 22°56' S, 46°14' W], mata secundária, (fl female), 5 Nov. 1979, **H.F. Leitão et al. 10608** [BM, NY, SP n.s., SPF n.s. (dig. photo), UEC n.s.], "arvoreta até 5 m; flores branco-pardacentas"; – [São José do] Barreiro, "Expedição do Rio Feio", [ca. 22°39' S, 44°35' W], (fr), 9 Jul. 1905, **G. Edwall 71** [SP n.s. (dig. photo)], "árvore pequena"; – Município de Porto Feliz, Ribeirão Avecuia, [23°11' S, 47°30' W], floresta ciliar, (fr), 1997, **L.V.B. Bufo & P.C. Sabadim 34** [ESA 2× n.s. (dig. photo)]; – Itú, mata do Governo, [23°16' S, 47°18' W], mata, (fr), 25 Jan. 1934, **F.C. Hoehne s.n.** [LL, S, SP n.s., SPF n.s. (dig. photo), WU]; – Cabreúva, mata da Casa Branca, 23°16'00,6" S, 47°02'50,2" W, mata mesófila semidecídua; interior da mata, (fr), 16 Mar. 1994, **K.D. Barreto et al. 2176** [ESA n.s. (dig. photo), SP n.s.], "árvore 6 m; frutos imaturos verdes"; – Mun. de Jundiaí, Serra do Japi, [23°14' S, 46°57' W], em mata alterada, (fr), 18 Apr. 1995, **C.Y. Kiyama et al. 85** [SPF n.s. (dig. photo), UEC], "arbusto 2 m; frutos imaturos verdes"; – Jundiaí, Estação Experimental do IAC, [ca. 23°11' S, 46°52' W], floresta mesófila, (fr), 5 Apr. 1995, **S.L.J. Mendaçolli et al. 1375** [ESA n.s. (dig. photo), HRCB n.s., IAC n.s., SPF n.s. (dig. photo)], "árvore ca. 8 m; frutos imaturos"; – Jundiaí, Faz. Rio das Pedras, [ca. 23°13' S, 46°52' W], (fr), 25 Jul. 1957, **J. Navas IAC 18434** [FHO (fragm.), IAC n.s., W]; – Atibaia, Faz. Grota Funda [= Parque Municipal do Itapetinga – Grota Funda], [23°11' S, 46°32' W], (fr), 4 May 1987, **L.C. Bernacci et al. 21110** [UEC, W], "árvore 8–9 m; frutos imaturos verdes"; – same locality: na trilha do interior da mata, (fl male), 16 Nov. 1987, **J.A.A. Meira Neto et al. 21350** [UEC, W], "árvore 8 m; botões verdes"; – Serra do Itapetinga, [ca. 23°12' S, 46°30' W], mata de galeria, (fr), 25 Mar. 1997, **A. Rapini 241** [SP n.s. (dig. photo)], "árvore ca. 5 m; frutos verdes"; – Iperó, Fazenda Ipanema [= Floresta Nacional de Ipanema], [23°26' S, 47°38' W], (fr), 6 Aug. 1994, **J.Y. Tamashiro et al. 468** [SPF n.s. (dig. photo), UEC n.s. (dig. photo)], "arbusto; frutos vináceos"; – Mun. Sorocaba, km 75 da Rod. Castelo Branco, Sítio Alegria do Pai, [not

located, ca. 23°23' S, 47°26' W], mata de galeria, (fl female), 22 Nov. 1987, **D.C. Zappi et al. 8** [SPF n.s. (dig. photo)], "arbusto 2 m; flores esverdeadas"; – Município de São Roque, Mata da Câmara, 23°31'26" S, 47°6'45" W, mata mesófila, semidecídua, (st), 17 Mar. 1994, **E. Cardoso-Leite & A. Oliveira 356** [ESA n.s. (dig. photo), UEC], "12 m"; – E.E. São Roque, [23°32' S, 47°8' W], mata secundaria; borda da mata, (fr), 26 Apr. 1994, **R.B. Torres et al. 121** [IAC n.s., SPF n.s. (dig. photo), UEC], "árvore 15 m; frutos maduros marrom"; – Itapeva, Rio Taquaril, Rod SP 258, km 289, de Itapeva para Itararé, 639 m, 23°58'31" S, 48°55'7" W, (fl female), 23 Oct. 2007, **A. Lobão et al. 1396** [CEPEC n.s., MBM n.s., RB n.s. (dig. photo)], "árvore ca. 7 m; folhas lisas; flores verdes; frutos maduros escuro"; – Ilha Vitória, litoral norte, ponta sudeste, Farol, [23°45' S, 45°1' W], rara na encosta pedregosa, (fr), 6 Apr. 1965, **J.C. Gomes 3680** [SP 2× n.s. (dig. photo)], "arvoreta ca. 2,5 m; frutos doces, cor de vinho"; – Município de Itanhaém, Ilha da Queimada Grande, [24°29' S, 46°41' W], (fr), 26–27 Jul. 1997, **F.T. Farah & M.R. Gorenstein 31** [ESA n.s. (dig. photo)], "arbusto 1 m; frutos esféricos vinho"; – same locality: mata, (fr), 11–12 Apr. 1996, **V.C. Souza et al. 11010B** [ESA n.s. (dig. photo)], "arbusto o árvore até 4 m; frutos imaturos verdes"; – same locality: (yfr), 23–24 Jan. 1997, **G.O. Joaquim et al. 75** [ESA n.s. (dig. photo)], "árvore até 8 m; PAP = 36 + 15 + 32; frutos vermelhos"; – same data except for: beira de mata, (fr), **121** [ESA n.s. (dig. photo)], "arvoreta até 2 m; frutos vermelhos"; – Ilha da Queimada, [ca. 24°25' S, 46°45' W], (fr), 5 Apr. 1920, **A. do Amaral & Domingues 3** [SP 2×]. – Paraná, Cidade Jataizinho, estrada de ferro p. Rancho Alegre, [23°12' S, 50°57' W], beira da estrada; beira de barranco, (fr), 12 Dec. 1997, **L.R.M. Souza et al. s.n.** [FUEL n.s., G], "árvore 6 m; frutos imaturos verdes"; – Assai [= Açaí], Fazenda São Francisco, [not located; ca. 23°22' S, 50°51' W], (fr), 9 Oct. 1997, **L.R.M. Souza et al. s.n.** [ICN n.s. (dig. photo)], "árvore 7 m; frutos imaturos verdes e maduros marrom"; – same locality: (fr), 9 Dec. 1997, **E.M. Francisco & L.R.M. Souza s.n. FUEL 21141** [K], "árvore 15 m; frutos imaturos verdes"; – São Jerônimo da Serra, Fazenda Tangará, [ca. 23°43' S, 50°44' W], borda da mata, (fr), 29 Jun. 2000, **E.M. Francisco et al. s.n.** [FUEL 29910 n.s., RBR n.s. (dig. photo)], "árvore 6 m; frutos maduros pretos"; – Sapopema, Salto das Orquídeas, [23°55' S, 50°36' W], borda da mata, (fr), 19 Apr. 1997, **C. Medri et al. s.n.** [ESA n.s. (dig. photo)], "árvore 5 m; frutos esverdeados e arroxeados"; – same locality and collectors: encosta rochosa; beira do pasto próximo ao caseiro, (fl male), 11 Oct. 1997, **472** [ESA n.s. (dig. photo), FUEL n.s.], "árvore 5 m; flores cremes com cálice verde"; – same locality: beira do penhasco; próximo à casa, (fl male), 10 Oct. 1998, **C. Medri & E.M. Francisco 697** [ESA n.s. (dig. photo), FUEL n.s.], "árvore 5 m; flores verdes"; – same locality: (fl male), 4 Oct. 1995, **F. Chagas e Silva & H. Soares-Silva 1835** [FUEL n.s., G, UEC], "árvore 8 m; botões florais e flores esverdeadas"; – Rodovia Tomazina a Matão, Fazenda Santa Helena (Mun. Tomazina), [ca. 23°49' S, 49°59' W], mata, (fr), 18 Mar. 1994, **G. Hatschbach & E. Barbosa 60567** [BHCB, C, CTES, G, HBG, MBM n.s., Z], "pequena árvore de frutos vinosos"; – Ortigueira, trevo Ortigueira-Ponta Grossa, [ca. 24°13' S, 50°56' W], (fl female, fr), 26 Aug. 1997, **M.R.C. Paiva et al. s.n. (FUEL 26215)** [ESA n.s. (dig. photo), RB n.s. (dig. photo), SPF n.s. (dig. photo)], "árvore 7–7,5 m; botões florais; fruto imaturo verde, maduro castanho-escuro"; – Mun. Adrianópolis, Água Branca, Rio Ribeira, 250 m, [ca. 24°40' S, 49°1' W], mata pluvial ás margens do Rio, (fr), 28 Jul. 1987 [MBM: 28 Aug. 1987], **G. Hatschbach & J.M. Silva 51300** [BHCB, G 2×, K 2×, MBM, MEXU, UB, US], "árvore 8 m; frutos vinosos, levemente odoríferos"; – same area: Tejuco Alto [not located], vale do Rio Ribeira, [ca. 24°40' S, 49°1' W], mata, (fr), 22 Aug. 2000, **J.M. Silva et al. 3193** [ESA n.s. (dig. photo), HSJRP n.s., MBM n.s., SPSF n.s.], "árvore 5 m; fruto imaturo"; – Cerro Azul, E of the town, 500 m, [24°50' S, 49°15' W], forested ridge, (st), 4 Aug. 1966, **J.C. Lindeman & J.H. de Haas 1995** [K, U], "3 m tall, 1.5 cm diam."; – Mun. Quedas do Iguaçu, Espigão Alto, [25°25' S, 52°48' W], mata degradada, (fr), 22 Jun. 1995, **C.B. Poliquesi & F. Deodato 320** [MBM], "árvore 5 m; frutos amarelados"; – without data, (fl female), s.d., **J. Tweedie s.n.** [K]. – Santa Catarina, Itajaí, Praia Braba, 3 m, [26°57' S, 48°38' W], restinga, (fl male), 23 Oct. 1966, **R.M. Klein & Ravenna 6857** [R], "arbusto 3 m; flor verde"; – Rio do Sul, Serra do Matador, 550 m, [ca. 27°12' S, 49°35' W], mata, (fr), 16 Apr. 1959, **R. Reitz & R.M. Klein 8753** [BR, G, M, NY, R, UC, US, Z], "árvore 10 m; fruto maduro roxo, comestível"; – Florianópolis, Ilha de S. Caterina, Morro do Ribeirão, 50 m, [27°43' S, 48°33' W], capoeira, (fl male), 15 Oct. 1968, **R.M. Klein & A. Bresolin 7868** [ICN n.s., R], "arvoreta 4 m; flor verde"; – same area: Pântano do Sul, 5 m, [27°46' S, 48°30' W], restinga, (fl male), 5 Oct. 1964, **R.M. Klein et al. 5807** [MBM, R], "arbusto 3 m; flor verde"; – Siriú, Garopaba, [28°1' S, 48°38' W], dunas areia, (fr), 18 Jan. 1974, **A. Bresolin 83** [MBM], "arvoreta 3 m; fruto verde"; – Morro dos Conventos, [28°57' S, 49°23' W], dunas, (fl female), 1 Nov. 1976, **M.L. Porto et al. 2269** [ICN n.s. (bad dig. photo)]; – same locality: dunas, (fl female), 19 Nov. 1970, **A.R. Schultz ICN 7913** [ICN n.s., U], "arbusto"; – Sombrio p. Araranguá, 10 m, [29°5' S, 49°37' W], in silva campestri; no capão, (fr), 23 Sep. 1944, **R. Reitz C 713** [B, R, RB n.s. (dig. photo)], "arvoreta 5 m; fruto maturo roxo, 1–3 cm diam."; – "Province de Ste. Catherine", sables martitimes, (fl female), 16 Nov. 1862, **J. Nadeaud s.n.** [P 2×],

"arbrisseau". – Rio Grande do Sul, Torres, [29°21' S, 49°44' W], (fr), 11 Jan. 1979, **K. Hagelund 10859** [ICN n.s. (dig. photo)]; – same locality: (fr), 10 Jan. 1977, **K. Hagelund 10991** [ICN n.s., W]; – 23 May 1975, **M.L. Porto 1504** [ICN n.s. (bad dig. photo seen)]; – Torres, Butiazal, [29°21' S, 49°44' W], (fr), 28 Jan. 1976, **K. Hagelund 10858** [C, CTES]; – same locality: (fr), 11 Jan. 1977, **K. Hagelund 10859** [C]; – (fl male), 21 Nov. 1970, **A.R. Schultz ICN 7880** [ICN n.s., U], "arbusto"; – Torres, Guarita, [29°21' S, 49°44' W], (fr), 22 Sep. 1979, **K. Hagelund 12955** [ICN n.s. (bad dig. photo)]; – Torres, Morro do Farol, [29°20' S, 49°43' W], declive sul, (fl male), 12 Nov. 1972, **J.C. Lindeman et al. ICN 20812** [ICN n.s., U], "arbusto de 1,5 m"; – Mun. de São Francisco de Paula, Linha Feixe, 515 m, [ca. 29°27' S, 50°35' W], em orla da mata, (fl female), 4 Dec. 2004, **R. Wasum & M. Rossato 2257** [HUCS n.s., RB n.s. (dig. photo)]; – Sapiranga, Alto Ferrabraz, [29°38' S, 50°58' W], (fr), 11 Mar. 2001, **L. Amaral HASU 16013** [HASU n.s. (dig. photos)]; – Butterberg [not located] prope Montenegro, [29°42' S, 51°28' W], (fl female), 13 Nov. 1950, **B. Rambo 49102** [NY]; – vicinity of São Leopoldo, [29°46' S, 51°9' W], (fl male, fl female), Sep.–Oct. 1941, **J.E. Leite 618** [FHO (fragm.), NY]; – same data except for: (fl male), Nov. 1941, **1792** [GH]; – (fl female, fr), Oct. 1941, **1792** [GH]; – same locality: 20 m, in silva campestri, (fl male), [MO, NY:] 10 Oct. 1946, [S:] 30 Nov. 1946, **E. Henz 35555** [MO, NY, S], "arbor usque 10 m alta, 0,3 crassa; fructus magnitudine cerasi magni, niger, edulis"; – same locality: (fr), 24 Apr. 1961, **A. Sehnem 7855** [B, C]; – São Leopoldo, in ora silvula, (fr), 30 Dec. 1901, **G.O.A. Malme s.n.** [S]; – same locality: mata, (fl female), 10 Oct. 1934, **B. Rambo 813** [CAS]; – São Leopoldo, Unisinos [Universidade do Vale do Rio dos Sinos], [29°48' S, 51°9' W], borda de mata, (fr), 24 Apr. 1997, **A.A. Ohlweiler (330) HASU 6005** [HASU n.s. (dig. photos)], "arvoreta 3,5 m, repleta de frutos negros brilhantes; folhagem brilhante"; – Rio dos Sinos, [ca. 29°50' S, 51°13' W], (fl male), 8 Nov. 1949, **B. Rambo 44282** [E]; – ad flumen Río dos Sinos, [B:] Esteio p. P. Alegre, [29°50' S, 51°11' W], in silva campestri, (flbuds female), 8 Nov. 1949, **B. Rambo 44330** [B, C, LIL n.s., UPS, W]; – Sto. [Santo] Antônio da Patrulha, [29°50' S, 50°30' W], (fr), 24 Jan. 2001, **T.C. De Marchi 24** [HASU n.s. (bad dig. photos)]; – Cachoeira [do Sul], in silvula Santa Clara [not located], [ca. 30°1' S, 52°53' W], in silvula, (fr), 30 Jan. 1902, **G.O.A. Malme 1286** [S], "arbor parva", [this is a quite isolated population; BUDKE et al. (2008) report another population from a nearby site at 30°1' S, 52°47' W]; – Arroio dos Ratos, Fazenda Faxinal, [30°5' S, 51°44' W], (fr), 23 Apr. 1975, **K. Hagelund 10859** [ICN n.s., W]; – Guaíba, Mariana Pimentel, Colônia do Podocarpus, [30°20' S, 51°35' W], mata primária, (fr), 13 May 1979, **N.I. Matzenbacher ICN 44492** [ICN n.s. (bad dig. photo)]; – Pôrto Alegre, Morro da Gloria, [30°4' S, 51°12' W], (flbuds female, fr), 26 Oct. 1945, **B. Rambo 29321** [LIL n.s., TEX, W]; – same area: mata, (fl female), 11 Oct. 1931, **B. Rambo 813** [SP]; – Morro da Policia, [30°5' S, 51°11' W], in silvula campestri, (fl male), 20 Nov. 1948, **B. Rambo 38129** [B, LIL]; – Vila Manresa [not located], [ca. 30°5' S, 51°10' W], in silva campestri, (fr), 16 Aug. 1942, **B. Rambo 2481** [B], "fr. maturo"; – Morro Santana, Campus UFRGS, [30°4' S, 51°8' W], (fl male), 24 Oct. 1995, **M. Ritter 873** [F, SMDB n.s.]; –Viamão, Parque Saint-Hilaire, [30°5' S, 51°2' W], no mato, (fr), 20 Mar. 1972, **J.C. Lindeman et al. ICN 9781** [ICN n.s. (dig. photo), U], "árvore 15 m, 26 cm diam.; fruto ainda verde"; – same data except for: na beira de matinho, **9782** [ICN n.s., U], "arbusto de 4 m; fruto vermelho escuro 5R2/6; mesocarpo amarelado; 6 sementes marrom 5YR4/8"; – pr. Viamão, [30°5' S, 51°2' W], (flbuds female), 2 Nov. 1949, **B. Rambo 44231** [C, LIL n.s., UPS, US]; – same data except for: **44331** [UC]; – Tristeza, [30°7' S, 51°15' W], (fr), 3 Feb. 1948, **Palacios-Cuezzo 751** [CAS, MO]; – Morro do Sabiá, [30°8' S, 51°14' W], (fr), 28 Dec. 1948, **B. Rambo 39273** [F, K, LIL n.s., W]; – Porto Alegre, Morro Tapera, acesso pela estrada Juca Batista, [30°8' S, 51°11' W], encontrada no mato, solo granítico; relevo na encosta, (fr), 8 May 1979, **L. Martau & L. Aguiar 44** [CTES], "árvore ± 5 m, pouco numerosa; fruto vinho"; – Itapuã, Viamão, [30°16' S, 51°1' W], edge of forest, (fr), May 1983, **M. Sobral 2050** [F], "tree 4 m; fruits mature, brown-reddish"; – Morro da Grota, Viamão, [30°22' S, 51°1' W], beira de estrada não mexida, no vale, solo granito, (fl male, fl female), 21 Nov. 1979, **L. Aguiar 228** [CTES, F], "planta pouco numerosa e dispersa na beira; flor esbranquiçada"; – Viamão, Parque Estadual de Itapuã, Morro do Campista, [30°23' S, 51°2' W], na mata, (fr), 5 Jun. 2003, **J.G. Kray 63** [ICN n.s., W], "árvore 10 m; frutos escuros"; – Rodovia Caçapava – Lavras, Caçapava do Sul, Guarita, [ca. 30°35' S, 53°30' W], afloramento de arenito, (fr), 30 May 1976, **M.L. Porto et al. 2194** [ICN n.s. (dig. photo)]; – Camaquã, Pacheca, [31°8' S, 51°48' W], mata arenosa; na borda da mata, (fr), 9 Oct. 1999, **C. Mondin & A. Lob 1901** [HASU n.s. (dig. photos)], "árvore ca. 5 m; frutos maduros vináceos"; – S. Lourenço do Sul, Faz. Crisanto Soares, 30 m, [ca. 31°22' S, 52°1' W], in silva campestris, (fr), 10 Dec. 1965, **A. Sehnem 8582** [C, F]; – Horto Botânico Ir. Teodoro Luiz, Capão do Leão, [31°46' S, 52°30' W], no interior de mata arenosa, (fl male), 30 Nov. 1986, **J.A. Jarenkow 515** [ICN n.s., UEC], "árvore ca. 6 m; flores verde-amareladas"; – E.E. Taim, Rio Grande, [32°30' S, 52°35' W], interior do mato, (flbuds male), 30 Nov. 1978, **J.L. Waechter 1044** [F, ICN n.s. (dig. photo), SP], "árvore ca. 7 m; cálice verde; corola verde-clara com pilosidade branca; fruto

pardo-avermelhado"; – Rio Grande (oppido), in dumatis Punacrum ripa sinus Lacco da Mangueira, [ca. 32°47' S, 52°35' W], (flbuds female), 7 Nov. 1901, **G.O.A. Malme 235** [S], "arbor parva inermis"; – same area: in dunis ripa, (fr), 27 Mar. 1902, **G.O.A. Malme s.n.** [S]; – without further data, (fl male), 1833, **C. Gaudichaud 14** [G-DC (fragm.), BR, P]; – (fl female), 1946, **L. Tatto 3677** [WIS (MAD)]; – Brazil, without data, (defl), s.d., **F. Sellow 1211** [K]; – (fl male), s.d., **F. Sellow s.n.** [BM, B 2×, GH, LE, PH, U, UC, US]; – (fl male), s.d., **F. Sellow 1689** [P, S, US]; – (fr), s.d., **E. Ule s.n.** [HBG 2×].

Paraguay, San Pedro, Yaguarete Forest (Sustainable Forest Systems site), 152 m, 23°47'54" S, 56°8'59" W, tall forest, (fr), 13 Mar. 1998, **E.M. Zardini & L. Guerrero 48505** [AS n.s., MO], "fruit green"; – Colonia Nueva Germania, [23°54' S, 56°34' W], montes ribereños, (fl male), Dec. 1916, **T. Rojas (2026) 10431** [SI], "frutex 3–4 m; pétalos verdio-cenizados". – Cordillera, in regione lacus Ypacaray [= Ypacaraí], orillas mont. alturas [San] Bernardino, [25°18' S, 57°18' W], (fl male), Sep. 1913, **E. Hassler 12287** [G 4×; confusion between the numbers 12287 and 12387 occurred!], "arbor 6–7 m; petala verde amarillenta". – Alto Paraná, Rva. Itabó, [25°4' S, 54°30' W], bosque bajo, (fr), 4 Apr. 1980, **Itaipú Binacional [G. Caballero Marmori] 677** [MO], "arbolito 5–6 m; fruto pequeño, drupáceo; infructesc. axilar"; – Centro Biológico Tatí Yupí, [25°19' S, 54°35' W], campo cerrado, (fr), 15 Nov. 1989, **G. Caballero Marmori 1655** [CTES], "flor blanca"; – Vivero Forestal Itaipú, [25°22' S, 54°34' W], bosque explotado; bosque alterado, en picada, (fl male), 2 May 1980, **G. Caballero Marmori 708** [CTES, G, MO], "árbol 4–6 m; flor verdosa; haz verde oscuro, envés verde claro"; – Irala [= Domingo M. Irala], [25°54' S, 54°37' W], (fr), 13 Nov. 1951, **J.E. Montes 11093** [LP], "árbol 7 m, escaso; frs. amarillo-verdosos"; – Ñacunday, [26°1' S, 54°46' W], hab. monte; lug. alto areno-pedregoso, (fr), 5 Nov. 1951, **J.E. Montes 11018** [LP], "árbol caducifolio, 1–2 m, escaso; frutos cremosos, verde amarillos"; – Paraguarí, Cordillera de Altos, [25°31' S, 57°16' W], in silva et campis montanis, (fl female), Oct. 1898–1899, **E. Hassler 3354** [A, BM, G 6×, K, MO, NY, P, S, UC, W], "arbor vel frutex 4–6 m; 0,1–0,2 m diam.; corolla viridis [corolla viridescens]; fructus bacca rubra"; – same area: silvis, (fl male, fr), Dec. 1904, **E. Hassler 2159** [G 3×]; – Cerro Yari-guaa-guazu, etre Paraguari et Acaahy [= Acahay], [25°44' S, 57°8' W], (fr), 20 Feb. 1883, **B. Balansa 4646** [G-DC, G 2×, P], "arbuste de 2 m de hauteur; fruits charnus d'un brun rougeatre á leur maturité"; – prope Sapucay, [25°40' S, 56°57' W], (fl female, fr), Sep. 1913, **E. Hassler 12287a** [A, BM, C 3×, E, F, G 6×, GH, K, MICH, MO 2×, NY, S, UC, WIS n.s., Z 2×; confusion between the numbers 12287a and 12387a occurred!], "arbor 6–7 m"; [G 1×, US: "in regione lacus Ypacaray" – confusion and label mixture occurred!]; – prope Sapucay, (fl male), Sep. 1913, **E. Hassler 12387** [A, BM, C 2×, E, F, G, GH, K, MICH, RB n.s. (dig. photo), S, SI, US, Z; – confusion between the numbers 12287 and 12387 occurred!]; – Acahay Massif, easternmost peak, base of peak, 25°52' S, 57°08' W, (fr), 27 Jan. 1992, **E. Zardini & P. Aquino 30023** [FHO, MO, PY n.s., W], "treelet 4 m"; – same place, coordinates and collectors: northern slope, forest, (fr), 17 Feb. 1992, **30420** [FHO, MO, PY n.s., W], "tree 15 m"; – on rocky summit at eastern area, scrub on rocky summit, (fr), 26 Feb. 1992, **30654** [FHO 2×, MO, PY n.s., W], "tree 12 m"; – same place and coordinates: near rocky summit at western area, forest near rocky summit, (fr), 26 Feb. 1992, **E. Zardini & R. Franco 30715** [FHO, MO, PY n.s., W], "tree 8 m"; – Macizo Acahay, on eastern peak, 500 m, 25°54' S, 57°09' W, forest, (flbuds female, fr), 30 Jun. 1989, **E. Zardini & C. Cuevas 5294** [FHO, MO, PY n.s.], "tree 4 m". – Guairá, Villarrica, [LP:] Monte Hiaty, [25°44' S, 56°31' W], very rare in thickets, (fl female, fr), 15 ? 1909, [MO:] 10 May? 1908, **P. Jörgensen 3766** [A, C, DS, F 2×, GH, LP, MO, NY, PH, S, SI, US], "3–4 m a small tree; petals green"; – Villa Rica, [ca. 25°45' S, 56°26' W], (fr), 7 Dec. 1874, **B. Balansa 2387** [G, K, P 2×], "arbrisseau de 3–4 m de hauteur"; – prope Villarica, [BM:] in regione collium, Cordillera de Villa-Rica, [ca. 25°49' S, 56°16' W], in dumeto humido, (fr), Jan. 1905, **E. Hassler 8846** [BM, G 3×, NY], "arbor parva 3–4 m"; – Tororó, Cerro Mymyi, frente al Destacamento Militar, [25°50' S, 56°17' W], (fr), 11 Dec. 1988, **R. Degen 1137** [G], "arbusto de 1 m"; – Cordillera de Ybyturuzú, Mymyi, 25°55' S, 56°15' W, en el cerro; bosque, (fr), 12 Nov. 1988, **I. Basualdo 1841** [FHO, MO], "árbol 5–6 m; frutos verdes"; – valley between Cerro Peró, Cerro Acatí and Cerro Muy Muy, 25°55' S, 56°15' W, base of cerros forest, (fr), 13 Jan. 1989, **E. Zardini 9447** [FCQ n.s., FHO, MO, W], "tree 15 m"; – Cerro Peró, 1 km W of Destacamento Tororó, western side of Cerro Peró, on trail to cave, 25°55' S, 56°15' W, forest, (fr), 13 Jan. 1989, **E. Zardini & A. Aguayo 9525** [FCQ n.s., FHO, MO, W], "tree 12 m"; – road Melgarejo-Antena, eastern slopes, 6 km S of Melgarejo, 25°55' S, 56°15' W, forest, (fr), 13 Mar. 1989, **E. Zardini & C. Velásquez 11531** [FCQ n.s., FHO, MO, W], "tree 7 m"; – Iturbe, [26°3' S, 56°29' W], (flbuds female), 14 Oct. 1952, **J.E. Montes 12687** [LP], "árbol caducifolio 4 m, escaso; fls. verdes cremas". – Neembucú, de Curupaity ad Laureles, [ca. 27°10' S, 57°59' W], (fr), 4 Apr. 1980, **L. Bernardi 20478** [BM, F, G 2×, MO], "arbor 4 metralis ex imo ramificata, ramis leucophaeis; folia discoloria, coriacea elliptica et obovata; fructus pallide virides, globosi". – Misiones, Ea. [Estancia] La Soledad, 3 km S de Santiago, 27°10' S, 56°46' W, en isleta de selva, (fr), 3 Feb. 1988, **A. Schinini & R. Vanni 25999** [C,

CTES, F n.s. (dig. photo), G, GH, K, MICH, MO, SPF n.s., W], "árbol 3 m"; – same locality: (fr), 22 Apr. 1961, **T.M. Pedersen 5947** [A, BR, C, E, K, P, S, SI n.s., UC, US], "tree 7–10 m; ripe fruit dark brown".

Argentina, Chaco, Dep. 1° de Mayo, Colonia Benítez, [27°20' S, 58°56' W], selva sobre laguna, (fl male), 4 Dec. 1943, **A.G. Schulz 4090** [F, G 2×, MO], "arbolito 3–4 m, muy escaso; flores verdoso-blanquecinas"; – [SI:] Colonia Benítez; [MO:] Dep. 1° de Mayo, Laguna La Mora, Campo Antequera, [27°20' S, 58°56' W], orilla de río, (fl: Nov. 1930, fr: Mar. 1931), **A.G. Schulz 252** [MO, SI], "árbol 8–10 m, escaso; follaje verde oscuro; flor verdosa"; – Dep. San Fernando, Col. Resistencia, El Tragadero, [ca. 27°24' S, 58°56' W], borde estero, bosque ribereño, (fr), 18 May 1966, **A.G. Schulz 14197** [F, G], "árbol 5–7 m; frutos maduros castaños pulposos"; – vicinity of Barranqueras, 35–40 m, [ca. 27°29' S, 58°56' W], (fr), 12 Nov.–15 Dec. 1913, **H.M. Curran 96** [A n.s., BM, F, GH n.s., NY, US], "10 m high, 15 cm diam."; – Antequera, [27°26' S, 58°49' W], monte ribereño, (fl male), Dec. 1941, **A.G. Schulz 1878** [CTES, F, LP n.s.], "árbol 4–6 m, muy escaso"; – same locality: arroyo Iné, monte ribereño, (fr), Jan. 1937, **A.G. Schulz 1911** [CTES], "árbol 4–6 m, muy escaso; follaje oscuro y denso"; – Dep. San Fernando, Ea. Lagerheim, ca. 20 km S Rcia. [= Resistencia], camino a Basail, próximo Río Salado, [ca. 27°35' S, 59°10' W], isla monte alto sobre laguna, (fl male), Dec. 1938, **A.G. Schulz 2673** [F, MO], "arbolito 3–5 m"; – Basail [BURKHART (1979): "Resistencia"], [27°52' S, 59°18' W], (fl female), Dec. 1931, **T. Meyer 454** [GH, SI n.s.], "árbol 5–7 m, 20 cm diam.; corteza lisa". – Corrientes, Dep. San Cosme, Paso de la Patria, 85 m, [27°19' S, 58°35' W], (fl female, fr), 12 Mar. 1981, **Legname et al. 8048** [LIL], "arbusto 2,5 m; sépalos verdosos; corola blanquecina, tubulosa; fruto inmaduro verdoso"; – same locality and collectors: (fr), 18 Sep. 1981, **8590** [LIL n.s. (dig. photo)], "arbolito 3 m; fruto inmaduro verdoso"; – same locality: sobre la costa, (fl male), 5 Nov. 1978, **C.L. Cristóbal 1820** [C, CTES n.s., F, G, K, MO, UC, WIS n.s., ZT], "árbol ± 3 a 5 m"; – desvío de la ruta 12, por camino de tierra a Paso de la Patria, [27°20' S, 58°33' W], bosque de quebrachal degradado, (fr), 16 Feb. 1993, **E. Cabral 613** [CTES n.s., U], "arbolito 2 m; frutos verdes"; – Dep. Capital, loc. Corrientes, Molina Punta, Río Paraná, [ca. 27°28' S, 58°50' W], barrancas del río, (fl male), 31 Oct. 1975, **L. Anzotegui & A. Schinini 291** [G, MO, WIS n.s.], "2 m"; – en la barranca del río Paraná, M. Punta, [27°30' S, 58°50' W], fragmento de la selva marginal, (flbuds), 10 Nov. 1976, **U. Eskuche 4176** [Z]; – Dep. Ituzaingó, Isla Apipé, Pto. San Antonio, [27°30' S, 56°54' W], en interior de isleta de selva, (fl male), 19 Nov. 1976, **A. Schinini 13805** [C, CTES n.s., F, G, WIS n.s.], "árbol 5 m; flores verdosas"; – Rincón Ombú Chico, orilla del río Paraná, [27°25' S, 56°16' W], orilla de la selva marginal, (fr), 10 Mar. 1978, **A. Schinini 14746** [CTES n.s., ZT], "arbolito 2–3 m"; – Dep. Empedrado, Estancia "Las Tres Marias", near the Rio Paraná, [27°44' S, 58°47' W], hilly woodland on clay, (fl female), 6 Nov. 1952, **T.M. Pedersen 1886** [BR, C, LP, P, U, US], "shrub"; – Dep. Mburucuyá, Estancia "Santa Maria", [ca. 28°3' S, 58°13' W], woods & thickets on low ground, rare, (fr), 15 May 1961, **T.M. Pedersen 6048** [C, K], "shrub or small tree to 3–4 m; ripe fruit dark brown"; – Dep. Santo Tomé, Ea. Bertrán (Infrán Cué), 23 km SW de [Gobernador Ingeniero Valentín] Virasoro, [28°10' S, 56°12' W], borde de isleta de selva, (fr), 8 Apr. 1992, **S.G. Tressens et al. 4027** [A, CTES n.s., K, MO], "arbolito 2,5 m; frutos rojos"; – Dep. Mercedes, Laguna Iberá, Paso Picada, Reserva Natural Provincial del Iberá, [28°33' S, 57°11' W], borde de la selva marginal, junto al estero, (flbuds female, fr), 24–28 Feb. 1989, **S.G. Tressens et al. 3560** [F, K, MICH], "árbol 3–4 m; tronco 10 cm diam.; corteza gris claro"; – Dep. San Martín, 3 Cerros, Co. Pelón, [29°7' S, 56°57' W], entre rocas, (fr), 15 Feb. 1979, **A. Schinini et al. 17177** [F, MO], "árbol 1–3 m; ramificado desde la base". – Misiones, Dep. Iguazú, Parque Nacional Iguazú, [25°41' S, 54°26' W], (fr), 29 Jun. 1995, **J. Herrera 62** [LIL n.s. (dig. photo)], "árbol 12–15 m; frutos maduros morado-bronceado"; – Circuitos Cataratas, [25°41' S, 54°26' W], en selva marginal, (fr), 15 Oct. 1993, **S.G. Tressens et al. 4524** [CTES n.s., MO], "arbusto ca. 3 m; fruto rojo-vinosos"; – islas sobre las Cataratas de Iguazú, [25°41' S, 54°26' W], fragmento de la selva, (fr), 5 May 1969, **U. Eskuche 407** [Z], "arbolito"; – Dep. San Pedro, Monte Carlo, [26°34' S, 54°47' W], (fr), 9 Jan. 1949, **E. Schwindt 1111** [G 2×, IAN, P, US]; – S. Pedro, [26°38' S, 54°8' W], (fr), 26 Feb. 1907, **C. Spegazzini s.n.** [LP]; – Dep. Candelaria, Loreto, 220 m, [27°19' S, 55°32' W], monte, lug. alto, (fr), 28 Apr. 1948, **J.E. Montes 3476** [SI], "arbolito perennifolio?, 6 m, muy escaso; frutos cremosos, ligeramente amargo"; – Garupá, [27°29' S, 55°50' W], (fr), 21 Jan. 1947, **T. Meyer 11304** [LIL], "arbolito ± 5 m"; – Santa Ana, Picada San Javier, [27°43' S, 55°17' W], bosques, (fr), 18 Apr. 1910, **F.M. Rodríguez 291** [F, G 2×, NY, SI, U], "árbol 8–10 m". – Entre Rios, Liebig, [32°8' S, 58°16' W], bosque ribereño, (fr), 21 Jan. 1945, **C. Schulz 375** [A]; – Colón, Calera Barquín, [not located; ca. 32°13' S, 58°8' W], (fr), May 1927, **Augusti 27/1633** [BA n.s., F].

Uruguay, Salto, Saladero Consema [not traced; ca. 31°23' S, 57°57' W], (st), Apr. 1906, **M.B. Berro 3439** [C]; – Laguna Guayaca [not traced], (defl male), 1 Apr. 1906, **M.B. Berro 3354** [C]. – Rio Negro, Playa Ubisi, sobre el Río Negro, al N de Fray Bentos, [33°7' S, 58°17' W], (fr), 22 Dec. 1965, **Del Puerto &**

Fig. 10: Isotype of *Diospyros inconstans* JACQ. subsp. *psidioides* (KUNTH in HUMB., BONPL. & KUNTH) B.WALLN. [P].

Marchesi 5656 [F]. – ils et rives de l'Uruguay, (fl male), Nov. 18??, **s.coll. 240** [K], "arbres de petite taille"; ex "Herb. J.Ball, F.R.S., August 1890".

***Diospyros inconstans* JACQ. subsp. *psidioides* (KUNTH in HUMB., BONPL. & KUNTH) B.WALLN., comb.n.** – [Figs. 3, 6, 8, 10–12].

≡ *Diospyros psidioides* KUNTH in HUMB., BONPL. & KUNTH, Nov. gen. sp. 3: 254 (1819).
≡ *Macreightia psidioides* (KUNTH in HUMB., BONPL. & KUNTH) A.DC., Prodr. 8: 221 (1844).

Typus: Ecuador, Guayas, Guayaquil [protologue: crescit at litus Oceani Pacifici, prope Guayaquil Peruvianorum. Fructificat Martio], [2°10' S, 79°55' W], (fr), s.d., **A. von Humboldt & J. de Bonpland 3786** [lectotype (here designated): P-Hum (photo F 38716 at F 2×, GH, MO, US), isotype: P (Fig. 10)].

= *Diospyros conduplicata* KUNTH in HUMB., BONPL. & KUNTH, Nov. gen. sp. 3: 254–255 (1819).
≡ *Macreightia conduplicata* (KUNTH in HUMB., BONPL. & KUNTH) A.DC., Prodr. 8: 221 (1844).

Typus: Ecuador, Guayas, Guayaquil [protologue: crescit prope portum Guayaquil Peruvianorum. Floret Februario], [2°10' S, 79°55' W], (fl male, mostly defl), s.d., **A. von Humboldt & J. de Bonpland 3846** [lectotype (here designated): P-Hum, isotypes: P-Hum, P (photo F 38612 at GH, US)].

Note: "The photo numbered 38612 (Field Museum Chicago) shows a mixture of elements which belong to two different herbarium sheets: the twig and the incomplete label on the lower right side pertain to number 3846, the isotype of *D. conduplicata*, whereas the label on the lower left side and the squashed fruit on the lower right side belong to 3786, the isotype of *D. psidioides*.

= *Macreightia pavonii* A.DC., Prodr. 8: 222 (1844).
≡ *Maba pavonii* (A.DC.) HIERN, Trans. Cambridge Philos. Soc. 12 (1): 129 (1873).
≡ *Diospyros pavonii* (A.DC.) J.F.MACBR., Candollea 6: 18 (1934).

Typus: [Ecuador, Guayas, Guayaquil], (fl male + female), s.d. [1777–1788], **J.A. Pavón et al. s.n.** [holotype: G-BOIS (Fig. 11; photo F 8522 at GH, F, MICH, MO, NY), isotypes: B 3× (+ 1 photo ex MA), G, G-BOIS, G-DC (photo F 33869 at F, MICH, MO, US), G-DEL, MA n.s. (photo)].

Note: The protologue states: "in Peruviâ? aut Mexico? vulgo Orlaca (h. Pav.! ubi locus nat. [naturalis] nullus)" and further down "v. in h. Boiss." [vidi in herbario Boisseriano]. As stated on the label of the isotype in G-BOIS (obviously not seen by De Candolle), the specimens were collected in or near Guayaquil in Ecuador. Another isotype in G was erroneously attributed to "Sessé & Moçiño". – The specimen at MA (photo at B) which matches perfectly the type collection, bears the writings "Polygamia Dioecia – *Diospyros* sp. nov. – vulgo [vern. name] Orlaca – F. H. D. 169. L. 572 – Año de 1800" referring to the description and plate in TAFALLA's manuscript (which was finally published two centuries after his death in 1989). He had obviously a different collection at his disposal because he described and illustrated (the plate 572 was prepared by his drawer Xavier Cortés) female flowers and fruits and noted

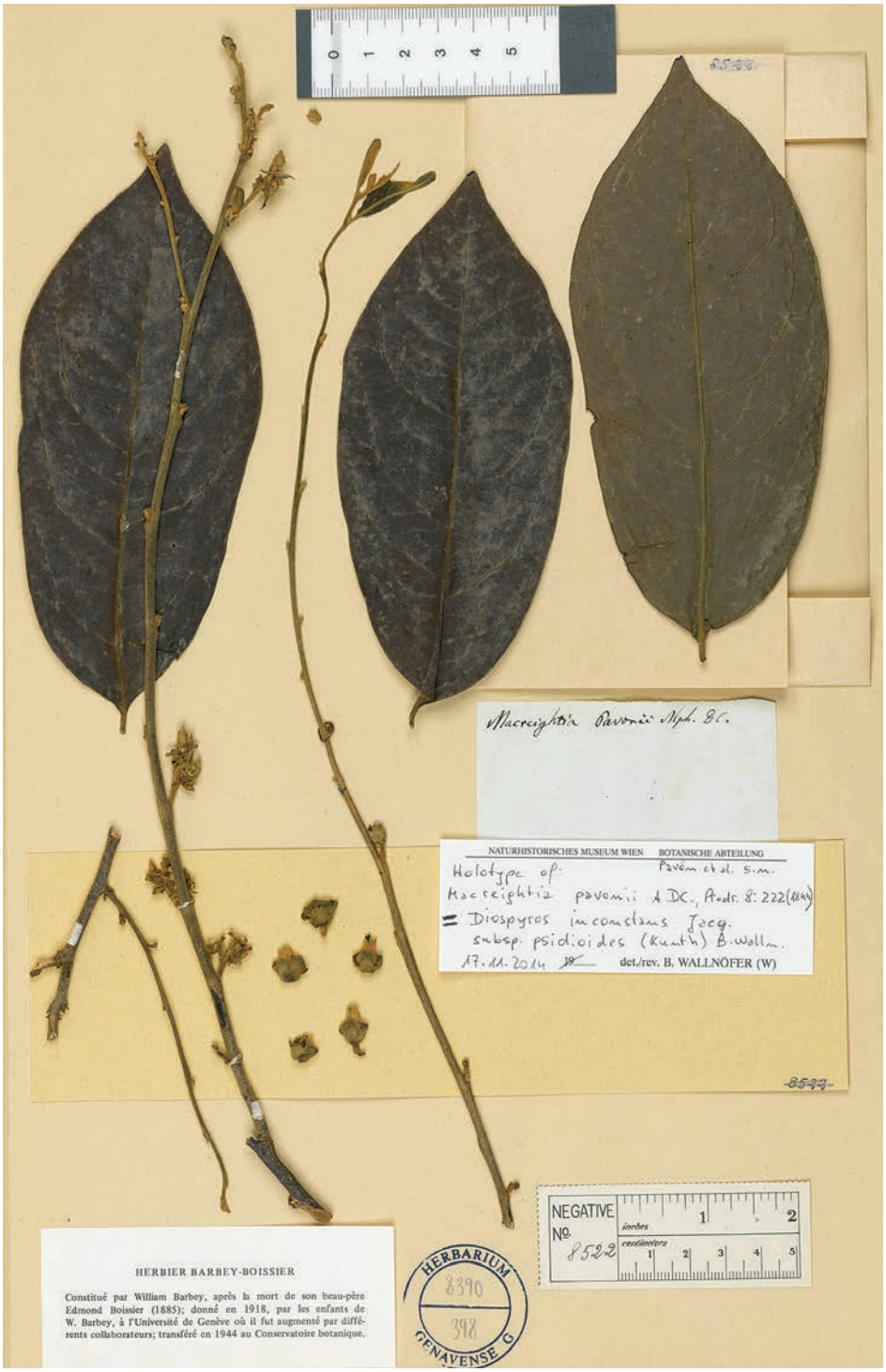

Fig. 11: Holotype of *Macreightia pavonii* A.DC. [G-BOIS].

that he was missing male flowers. The type collection displays on the other hand male and female flowers but no fruits. – Very unfortunately, the holotype was remounted in recent times and was heavily damaged (broken and fragmented; see Fig. 11) during this action (as can be noted when comparing it with the old photo 8522 mentioned above).

= *Diospyros velutina* HIERN, Trans. Cambridge Philos. Soc. 12 (1): 200–201 (1873).

Typus: Colombia, Tolima, "Prov. Mariquita", Piedras, bordes du Magdalena, [ca. 4°33' N, 74°49' W], 400 m, (fr), 1866, **J.J. Triana 2612** [lectotype: K (here designated), isolectotypes: FI, G-DC, P, W].

Note: HIERN (1873) created this taxon as a sort of dustbin to accommodate several quite different collections and wrote: "Possibly 2 or 3 different species are here described together". Astonishingly, he placed it in *Diospyros* instead of in the former genus *Maba*. The syntype collection Miers 3709 (from Rio de Janeiro, Praia de Itacoatiara, 22°58' S, 43°2' W) displays abaxially nearly glabrous leaf surfaces and belongs to subsp. *obovata*. The syntypes Gardner 1512 (from Ceará, Serra de Araripe, ca. 7°20' S, 40°1' W) and 2284 (from Piauí, between Tranqueira and Canavieira, 7°10' S, 41°48' W) belong to the same subspecies but the abaxially leaf surfaces are densely hairy. Another syntype, Wawra 226 (from Mexico, Campeche, Carmen, 18°38' N, 91°50' W) belongs, however, to the Central American *D. salicifolia* s.lat.

= *Diospyros boliviana* RUSBY, Mem. New York Bot. Gard. 7: 320–321 (1927).

Typus: [Bolivia], without collector, number, date and locality! – on top of the printed label: "Mulford Biological Exploration of the Amazon Basin", and annotated by hand: "see Economic Museum, No. 3959.2", (fr), [holotype: NY (Fig. 11)].

Note: The protologue states: "Without data as to locality or date, but probably on the lower Beni River". The herbarium specimen displays only one small leaf that coincides perfectly with the description given in the protologue! – In NY (specimen ID: 455215) there is a glass jar that contains several twigs with attached fruits and a small piece of a broken leaf preserved in liquid. I have seen photos of the jar and its content. The printed label on the jar states: "Mulford Biological Exploration of the Amazon Basin, 1921–22 – Bolivian Persimmon – (*Diospyros boliviana* RUSBY, n.sp.) – collected by H.H. Rusby in eastern Bolivia, 1921 – New York Botanical Garden, Economic Museum". At the top of this label there is the handwritten number "3959. ". The numeral following the period is no longer there because the corner of the label is ripped off, but the complete number is "3959.2" (see above). Strangely, the existence of this additional material preserved in liquid is not mentioned in the protologue (see RUSBY 1927). It can be regarded as isotype material.

= *Diospyros acreana* CAVALCANTE, Bol. Mus. Paraense Emilio Goeldi, N. S., Bot., 22: 1–2, figs. 1–5 (1966).

Typus: Brasil, Acre, Villa Epitácio Pessôa [today's Epitaciolândia], [ca. 11°2' S, 68°44' W], mata de terra firme, (fl male), 18 Nov. 1923, **J.G. Kuhlmann 846** [holotype: MG, isotypes: RB n.s. (dig. photo), W], "árvore 5–6 m; flor creme".

Treelet or tree up to 30 (Núñez 5450) or 40 m tall (Valenzuela & Farfán 9870), already flowering when 1.4 m tall (Nee 48820), with a trunk diameter (dbh) up to 41 cm (Flores & Tello 374, Hartshorn et al. 1667), deciduous (e.g., the type of *D. boliviana*; – at least

Fig. 12: Holotype of *Diospyros boliviana* RUSBY [NY]

partially tardily deciduous: Nee 38732); bark gray to dark brown or blackish, ± smooth or finely longitudinally scaly, or finely rectangular-flaky (Nee & Vargas 40218, Nee 39379), with a black internal ring or layer (Gentry & Josse 72731); inner bark white or cream, quickly turning tan, bright yellow or orange and the wood yellow when exposed (several reports, e.g., Daly et al. 9552, Perry & Cuellar 669, Núñez et al. 14462); **indumentum** consisting of simple, appressed, ± spreading or patent, straight or slightly flexuose, light (whitish) or rarely ferruginous hairs of varying length; twig apices and buds densely covered with appressed or spreading hairs (hairs sometimes densely felted); twigs subterete, gray or brown when dry, ± densely covered with patent, ± straight hairs of varying length; **leaves** alternate, with brochidodrome venation; petioles 3–15 mm

long, 1–2 mm thick, ± canaliculate adaxially, medium densely to densely hairy, winged distally; leaf lamina broadly lanceolate to elliptic, but often also obovate, oblanceolate or oblong, (1.5–) 5–15 (–18) cm long, (1.4–) 2.5–6 (–7.4) cm wide, (1.2–) 2–3.3 (–4.1) times longer than wide, widest in or above the middle, firmly chartaceous when fully mature (on fruiting specimens), dark green and slightly glossy adaxially and light green abaxially when alive, dull or slightly shiny adaxially, dull abaxially when dry, only slightly discolorous, often ± verrucose (due to subepidermal stone cell granules), on adaxial side with scattered, patent, straight, short hairs or glabrescent, on abaxial side in some populations with scattered, appressed or spreading, ± straight hairs, in other populations medium densely to densely covered with long, ± patent, straight or distally often arcuated hairs (e.g., Triana 2612, 4249 from Tolima in Colombia, Klug 4270 from San Martin in Peru or Gentry & Foster 71174 from La Paz in Bolivia); leaves often glabrescent; leaf apex acute or obtuse, sometimes broadly rounded or acuminate, rarely ± emarginate; base of the lamina cuneate and tapering into the petiole or obtuse; leaf margins entire, revolute especially proximally; flachnectaria usually few (up to 31 on Asplund 5004) on abaxial leaf surface, usually near base but sometimes also near the apex (rarely some in the middle of the lamina), circular or elliptic; midvein on adaxial side sunken in the proximal ½, ± flat towards the apex, scattered to ± densely covered with patent hairs, on abaxial side markedly prominent and scattered to densely covered with appressed to patent hairs; secondary veins ca. 6–8 per side, hairy on both sides, slightly prominent adaxially (but rarely together with their surroundings ± sunken and forming grooves on the adaxial leaf surface), prominent abaxially, usually darker or of the same color, rarely lighter than the lamina abaxially; intersecondary veins inconspicuous; tertiary and quaternary veins ± flat and usually inconspicuous on mature leaves (at least on fruiting specimens); **inflorescences** arranged at the base or along the proximal part of new shoots in the axil of leaves (the lowermost ones often in the axil of very small leaves or sometimes in the axil of caducous bracts); male inflorescence units (Fig. 8d) up to 1.5–2 cm long, consisting of a simple, usually 3-flowered (rarely up to 9-flowered, e.g., Asplund 15257) cyme covered with a dense, often ± felted indumentum; peduncles 2–7 mm long, 0.8–1 mm thick; pedicels of the lateral flowers 1–3 mm long, ca. 1 mm thick; female cymes usually 1-flowered (Figs. 8e, 8h), rarely with 2–6 flowers on some plants; stalk (peduncle and pedicel) 5–7 (–11) mm long, 1–1.5 mm thick, densely hairy (pedicels of the lateral flowers if present up to 7 mm long); bracteoles of male and female flowers 2–5 mm long, 0.8–1.5 mm wide, lanceolate, ± acute, densely hairy abaxially, glabrous adaxially, soon caducous; **flowers** 3 (rarely 4)-merous; male flowers (Figs. 8d, 8g) 7–12 mm long at anthesis (pedicels excluded), markedly differing in size between populations, erect (Daly et al. 9713), oriented downward (Daly & Strickland 6232) or hanging (Nee 33420, 39916, 50503, Nee & Vargas 40219), obviously noctiflorous (Daly et al. 9713: "all open flowers fallen by 8 a.m."; Nee 33420: "none fully open at mid-afternoon); calyx 4.5–6 mm long and 3–6 mm wide, undivided in the proximal 2.5–4 mm, green when alive, on the outside (including the lobes) densely covered with an indumentum composed of flexuose, appressed or ± spreading, short hairs; undivided part of the calyx narrowly cup-shaped or sometimes urceolate (Klug 4270), glabrous inside; calyx lobes (1–) 2.5–4.5 mm long and (2–) 3–4 mm wide, ± triangular, acute, flat on margins, adaxially densely covered with spreading or patent hairs, sometimes glabrous proximally; sinuses between the lobes inconspicuous; corolla green (6 records), greenish white (2), white or whitish (6), cream (5), yellowish (3), light yellow (2), or yellow

(Araujo et al. 1340) when alive, up to 8–10 mm long; throat at least sometimes greenish-violet (Steinbach 7362); tube 7–8 mm long, widest in or below the middle and there 2.5–3.5 mm wide, ± tapering distally, densely covered with long, thick, appressed to ± spreading, slightly flexuose hairs on the outside, glabrous near base and inside; throat constricted, ca. 0.5 mm wide; corolla lobes (3.5–) 4–4.5 mm long and 2–3 mm wide, ± elliptic or lanceolate, acute, on abaxial side densely hairy along the keel (as on tube) and with shorter, thinner hairs towards the margins and apex, glabrous adaxially; stamens 10 (Klug 4270), 12 (Nee 33420), in pairs, differing in length (the inner 3–4, the outer up to 5–6 mm long), glabrous, adnate to the corolla tube ca. 0.5 mm above its base, violet to pink (Steinbach 7340); filaments 1–3 mm long and ca. 0.2 mm wide; anthers 2–3 mm long and 0.5–0.8 mm wide, widest near base, tapering into a short, conical connective appendage distally; rudiment of the ovary densely hairy, lacking stylodia; **female flowers** (Figs. 8e, 8h) up to 12.5 mm long (petals erect, pedicels excluded), "held at downward angle" when alive (Nee 37029); calyx 7–9 mm long and 7–11 mm wide, green or yellow-green when alive, undivided in the proximal 3–5 mm, covered with an indumentum as on male flowers but hairs sometimes densely felted on buds; undivided part of the calyx cup-shaped, inside ± densely covered with appressed hairs except near the base; calyx lobes 3–6 (–9) mm long, 6–8 (–11) mm wide, sometimes imbricate, in some populations ± emarginate or ± truncate and mucronate, in other populations broadly rounded or ± obtuse (rarely acute), with ± flat, revolute or slightly involute margins, sometimes markedly flexed outwards near base, abaxially sometimes with ± raised veins, adaxially (inside) densely covered with spreading or ± patent, quite long hairs; proximal part of the lobes adaxially with a gable-like, raised, densely hairy step; area around the sinuses between the calyx lobes inconspicuous or protruding out- and downwards; corolla green (Asplund 5004, Prance et al. P26389), greenish cream (Gentry et al. 68996), or "creamy greenish white" (Nee 37029) when alive, up to 10.5 mm long at anthesis (Nee 37955, Gentry et al. 68996), covered with same indumentum as the male flowers, glabrous inside and in the proximal ⅓ on the outside; tube 6–8 mm long, widest in or above the middle and there ca. 4 mm wide; throat constricted, ca. 1 mm wide; corolla lobes 3–4.5 mm long, 2.5–3 mm wide, semielliptical, acute, glabrous adaxially; staminodia 3 (Nee 37955, Gentry et al. 68996, and in a small bud of Daly et al. 7876), antesepalous, 4 mm long, adnate to the corolla tube ca. 1 mm above its base, free except at base, glabrous; filaments 2 mm long, slightly tapering distally; antherodes flat, narrowly lanceolate, 2 mm long and 0.3 mm wide, tapering distally; ovary 3-carpellate, 6-locular, as a whole 4.5–5 mm long, 2.5 mm in diameter, tapering into the 2 mm long, conical style, densely covered with appressed, ± straight hairs; stylodia 3, fused up to the apex, densely hairy; stigmata deeply lobed; stalk of the **fruits** ca. 5 mm long, 2 mm thick; fruits (Figs. 8f, 8i) up to 6-seeded, ± depressed globose, up to 2.5–3 cm in diameter (3 cm wide according to Madsen et al. 2001), hanging (Nee 48220, 48820), smooth, green, turning greenish-brown, yellow-green, yellow, orange, reddish, red, purple-red, reddish-brown, and finally dark brown (Bonifaz & Cornejo 4047, Mostacedo & Uslar 1999) or mahogany-colored (Baldwin 2951) when fully ripe, in the dry state brown or blackish, smooth, ± shiny and with tightly adhering epidermis, densely covered with straight, appressed hairs around the apex, scattered hairy elsewhere when younger, glabrescent except at the apex, detaching with the calyx; fruit wall thin and ± leathery when fresh (Rainer 1682), ca. 0.3 mm thick when dry; fruit pulp sweetish, jellylike, ± colorless or brownish, scanty (Rainer 1682); calyx on fruits as a whole up to 1.8–2.5 cm wide and ca. 0.7 cm high,

green, yellow-green (Nee 48820) or brownish-green (Daly et al. 9715) when alive, covered with indumentum (see female flowers) or ± glabrescent; area around the sinuses between the calyx lobes inconspicuous; undivided (basal) part of the calyx ca. 10 mm wide, dish-shaped, without longitudinal ridges running down from the sinuses abaxially, displaying inside a raised, triangular platform with rounded corners and convex edges (derived from the gable-like, raised structure in female flowers) which is tightly appressed to the fruit and densely covered with centrifugally arranged, appressed, straight hairs; lobes 4–6 mm long and 10–16 mm wide, their shape markedly varying from population to population: ranging from broadly rounded, to slightly obtuse, ± truncate, retuse, emarginate or even to deeply bilobed (thus, calyces appearing 6-lobed; see Fig. 8f); lobes slightly involute, sometimes with ± raised veins abaxially, ± slightly apposed to the fruit or horizontally spreading; seeds brown or reddish-brown when fresh, bean-shaped, 12–15 mm long, 6–9.3 mm wide, 4–6.7 mm thick.

Notes: This subspecies inhabits a vast area and is quite variable. It seems impossible to split it up into more taxa. The petioles range from 3 to 15 mm in length (3–7 mm in Ecuador, 8–15 mm in Acre and southeastern Peru, intermediate in other areas). The leaf shape varies from broadly lanceolate to elliptic, but often it is also obovate, oblanceolate or oblong. The leaves are sometimes quite large and reach 18 cm in length. The leaf apex is typically acute or obtuse, but sometimes it is broadly rounded or acuminate, rarely ± emarginate. The expansion of the calyx lobes on the growing fruits is often irregular (see chapter: general notes) and the lobes become usually much wider than long and are finally often emarginate or sometimes even bilobed. Astonishingly, the calyces on fruits of Perry & Cuellar 669 from Santa Cruz in Bolivia are identical to those of Silva et al. 1089 from Maranhão in northeastern Brazil! – Some populations display a very dense indumentum on both leaf surfaces, such as Triana 2612 (lectotype of *D. velutina*) and 4249 both from Tolima in Colombia, Klug 4270 from San Martin in Peru and Gentry & Foster 71174 from a "small patch of cerrado vegetation" at 1400–1500 m altitude in La Paz in Bolivia. In addition, the adaxial leaf surface of these specimens is ± reticulate. These differences seem to be just mere adaptations to dryer habitats. – The populations in Mato Grosso (Brazil) are intermediate between subsp. *psidioides* and *obovata* and are listed separately further down.

Figures: branch, female flower, fruits (TAFALLA 1989, 2: plate 206); branch and male flower (CAVALCANTE 1966: figs. 1–5); branch with male flowers, fruits (TORRICO PARDO 1999: 273, fig. 41, as "*tetrandra*"); branch with fruits (NEE 2008: 233, fig. 143); seed, seedling (PAINE 1999–2007).

Distribution and phenology: It is known from Colombia (Tolima), Ecuador (Esmeraldas, Manabí, and Guayas), Peru (Cajamarca, San Martin, Huánuco, and Madre de Dios), Bolivia (Pando, La Paz, Beni, and Santa Cruz), and from Brazil (Acre, Rondônia, Mato Grosso, Pará, Tocantins, and Maranhão), (Figs. 3, 6, 8). – It was collected from sea level up to elevations of 500 (–1500) meters, and was found in flower from (September) October to March (to June), and in fruit all over the year.

Habitat and ecology: In Ecuador it grows in deciduous (summer-deciduous according to Iltis & Iltis E-583, E-584) or semideciduous, dry forests and scrubs, in thickets, in secondary vegetation, in dry forests close to the beach, on arid, dry hillsides, and was often reported from limestone. Cerón 16611 indicated it in the canton Manabí from a

transitional area between the dry tropical and the cloud forest. According to MADSEN et al. (2001), it is an occasional understory treelet in the dry (semi-deciduous) forest of the Puná Island in Ecuador. – In Cajamarca in the north of Peru, it was collected in remnants of a dry forest (Ortiz & Mateo 1136). In central and southern Peru it grows in primary and secondary, tropical to subtropical moist forests of the lowland, and sometimes also in floodplain forests. In the Manu National Park, PAINE (1999–2007, 2007), PAINE & BECK (2007), and PAINE & HARMS (2009) reported for "*D. pavonii*" 0.17 adult trees per hectare. – In Bolivia it was reported by several collectors from deciduous or semideciduous forests, from "secondary tropical evergreen moist forest remnants" (Nee 37954, 37955, 39379), from ± humid, occasionally inundated, ± open savannas. It has been collected along seasonal streams, on sandy soil, pastures, on disturbed places, on abandoned land, in thickets and in secondary forests. In southeastern Bolivia (Santa Cruz) it is at least in some areas a common species in "barbechos" (fallow fields) and along paths especially on sandy soil (NEE 2008). – In Acre it was reported from non-inundated forests (mata de terra firme), from a forest with a discontinuous canopy growing "on low levees and backsloping terraces that are inundated supra-annually" (Daly et al. 9713, 9715), from a capoeira (an open secondary forest; Oliveira 259), and from a pasture (Medeiros et al. 560). In Rondônia it was found in a secondary forest (Cid Ferreira et al. 8875) and in Mato Grosso in a forest of terra firme on clayey soil (Gomes & Miranda 16). In eastern Brazil it was collected in Pará in forests of terra firme (Prance et al. P26389, P26565), in a capoeira (Rosa et al. 4066), and in Maranhão in a cerradão (da Silva et al. 1089).

Seeds, seed dispersal, germination and seedlings: The seeds are dispersed by bats, mammals and large birds (FOSTER et al. 1986, 2007, LOBOVA et al. 2009). The primary seed dispersal by spider and howler monkeys (*Ateles paniscus* and *Alouatta seniculus*, respectively) and the effects of rodents and dung beetles on the fate of dispersed seeds are described by ANDRESEN (1999) for a rain forest in the Manu National Park (Madre de Dios, southeastern Peru). As noted by Foster & Terborgh (5078), the fruits are eaten in the same park also by squirrel monkeys (*Saimiri*). A large study about the "ecological factors affecting the diversity of tropical tree seedlings" was carried out by PAINE (1999–2007, 2007, compare also PAINE & BECK 2007, PAINE & HARMS 2009) in the same park (in the vicinity of the Cocha Cashu station). According to this study, the annual fruiting peak of "*D. pavonii*" is in August; the average seed mass is ca. 0.6 grams; and the cotyledons are epigeal. The germination rate was 21.3 %. Color photos of a seed and a seedling were presented.

According to own experiments carried out with fresh seeds collected by H. Rainer (1682) in Guayas (Ecuador), germination occurs 11–13 weeks (ca. three months) after planting and is very similar to that of *D. texana* (compare WALLNÖFER 2011). After the below-ground abscission of the cotyledons which remain trapped in the seed body, the initially arched hypocotyl (bearing distally the tiny, naked plumule) elongates, straightens out to a vertical position, and turns green. During the next few days the first, tiny, alternate, epicotyledonary leaves appear. This type of germination is called the "durian type" by NG (1976, 1991), or "crypto-epigeal" by DUKE & POLHILL (1981). – A treelet is still growing in a pot on the window-sill in my office, and requires being watered only from below (the superficial earth has to be kept completely dry, otherwise the plant soon begins to sicken)! Probably due to the unnatural conditions where it lives, it did never lose all the leaves during winter time.

Chromosome counts: R. Stockenhuber carried out counts using root tips taken from the plant growing in my office (see the preceding chapter; voucher specimen: Wallnöfer 14909 [W]). The fresh fruits were collected on the Cerro Blanco near Guayaquil in Ecuador (Rainer 1682). The plant was found to be diploid with 2n = 30 (TURNER et al. 2013).

Vernacular names: In Ecuador it is called "orlaca" in Guayaquil (TAFALLA 1989, 1: 267), "caimito" in Manabí (Josse 713), and "caimitillo" in Guayas (Núñez 296, Núñez & E. Yagual 222, Valverde 422). According to Hartshorn et al. 1667, the popular name in the Peruvian departments Ucayali and Huánuco is "quillo caspi". The names used in Bolivia are "tutumillo" in Beni (Krapovickas & Schinini 34768), "zonsorro" or "son-zorro" (Steinbach 7340, 7253), and "potrerillo" (Nee & Vargas 44934) in Santa Cruz. In Brazil it is named "pinhão-bravo" (Lima et al. 564), "sete camadas" (Daly et al. 9552), and "angelca preta" (Daly et al. 9713, 9715) in Acre, and "envira" (Gomes & Miranda) in Mato Grosso.

Use: The only little sweet fruits are edible (MOSTACEDO & USLAR 1999, Baldwin 2951).

Specimens examined: **Colombia**, Tolima, "Prov. de Mariquita", en la orilla del Magdalena, 500 m [probably around 4°33' N, 74°49' W], (fr), Feb. 1854, **J.J. Triana 4249** [BM], (Strangely, this specimen was identified by the monographer HIERN at a later point as "*D. guianensis* GÜRKE", a species which is quite different and which does not occur in Colombia).

Ecuador, Esmeraldas, Esmeraldas, [0°59' N, 79°42' W], thicket, (fr), 31 May 1955, **E. Asplund 16540** [S], "shrub ca. 3 m high"; – Quinindo [= Quinindé] and southward, [ca. 0°20' N, 79°25' W], (fl male), s.d., **F. Fagerlind & G. Wibom 2610** [S 2×]. – Manabí, camino San Sebastian – Agua Blanca, 200–400 m, 1°30' S, 80°34' W, transición entre el bosque nublado y seco tropical, (fr), 20 Sep. 1991, **C.E. Cerón 16611** [MO n.s., QCNE n.s. (dig. photo), W], "arbusto de 4 m; frutos redondo, ovalados de 1 cm de largo"; – Machalilla National Park, Estero Manta Blanca, 2 hours SE of Agua Blanca, 350–370 m, 1°35' S, 80°43' W, dry forest, (fr), 24 Jan. 1991, **A.H. Gentry & C. Josse 72731** [BM, F n.s. (photocopy), MO, QCNE n.s. (dig. photo)], "tree 17 cm dbh; fruits green; black bark ring; – same park: Piñas hasta cerro Avión Caído, orillas de los ríos Piñas y Plátano y en el cerro, 320 m, 1°35' S, 80°41' W, zona alterada, (fr), 13 Sep. 1991, **C. Josse 713** [AAU n.s., K, QCA n.s.], "árbol 20 m; frutos verdes"; – same park: límites del parque, 2–3 km al este de Guale, orillas del Río Ayampe, 100–200 m, 1°41' S, 80°44' W, vegetación arbustiva, (fr), 8 Aug. 1992, **A.P. Yánez et al. 1253** [QCA n.s., QCNE n.s. (dig. photo)], "árbol 10 m; tallo se oxida y se vuelve amarillo después de ser cortado; frutos verdes de hasta 1 cm de diámetro y con 3 semillas"; – Estero Seco, 250 m, 1°39' S, 80°37' W, bosque muy seco tropical, (fr), 29 Nov. 1993, **X. Cornejo & C. Bonifaz 916** [GUAY n.s. (dig. photo), QCNE 2× n.s. (dig. photo)], "árbol 5 m; frutos anaranjados". – Guayas, Guayaquil, Bosque Protector Cerro Blanco, Carretera Guayaquil – Salinas, km 15, trail from Caseta Papagayo to Sendero Buenavista to Centro de visitantes, 200–300 m, 2°10' S, 80°08' W, tropical dry forest; secondary forest with remnant canopy trees, (fr), 3 Nov. 1995, **J.L. Clark & T. Núñez 1571** [AAU n.s., K, MO, QCNE n.s. (dig. photo), W], "tree 2 m; fruit green; calyx lobes truncate"; – same area and coordinates: km 17, Sendero Canoa, 100–300 m, bosque seco tropical; suelo derivado de roca caliza, (fr), 30 Sep. 1996, **T. Núñez 278** [MO n.s., QCNE n.s. (dig. photo)], "árbol 4 m; fruto axilar verde, se oxida"; – same area and ecology: km 17, Mirador-Sendero largo Buenavista, 200–400 m, (fr), 1 Oct. 1995, **T. Núñez 296** [K, MO, QCNE n.s. (dig. photo)], "árbol 8 m; frutos verdes amarillos; brácteas foliares axilares"; – same area and ecology: km 17, caminos de acceso a casa administrativa, 50–100 m, (fr), 19 Dec. 1995, **T. Núñez & E. Yagual 222** [MO, QCNE n.s. (dig. photo)], "árbol 4 m; frutos amarillos o rojos cuando maduros"; – Casas Viejas, 22 km W of Guayaquil on road to Salinas, then north 5 km, 40–80 m, [ca. 2°13' S, 80°6' W], (fr), 25 Sep. 1981, **C.H. Dodson & P.M. Dodson 11934** [F, GUAY n.s., MO n.s., SEL], "small tree to 3 m; fruits yellow"; – Cerro Azul – entrada por Casas Viejas – Cord. de Chongon, [2°13' S, 80°6' W], (fr), May 1978, **F.M. Valverde 422** [MO n.s., SEL]; – road to Miguel Wagner's villa, km 9 N of Guayaquil on road to Daule, 50 m, [2°6' S, 79°56' W], (fr), 24 Sep. 1961, **C.H. Dodson & L.B. Thien 708** [LL, MO n.s., S, WIS], "small tree 12–15 ft. high"; – road from Guayaquil to Cuevedo [Quevedo], Miguel Wagner's hacienda area, 9 km N of Guayaquil, 75–100 m, [2°6' S, 79°56' W], (fr), 18 Nov. 1961, **C.H. Dodson & L.B. Thien 1304** [MO n.s., S, WIS], "shrub 5 ft. high; fruits green"; – Cerro Azul, 100 m, 2°8' S, 79°59' W, bosque seco tropical, intervenido, (flbuds male), 13

Mar. 1999, **X. Cornejo & C. Bonifaz 6798** [GUAY n.s. (dig. photo)], "arbolillo 3 m; prefloraciones verdes"; – same area: (fr), 13 Jun. 1955, **E. Asplund 16622** [S], "shrub ca. 5 m high"; – Cerro Azul, near Chongon, turn north at km 22, Guayaquil-Salinas and entered 6 km, 130 m, [2°10' S, 80°1' W], (fl male), 18 Mar. 1980, **C.H. Dodson et al. 9649** [F, MO n.s., SEL], "small tree to 4 m; flowers whitish"; – Bosque Protector Cerro Blanco, Carretera Guayaquil – Salinas, km 15, senderos de acceso a casetas Papagayo & Pigio, 300–400 m, 2°10' S, 79°50' W, [correct is: 2°10' S, 79°59' W], bosque seco tropical; bosque secundario; suelo sobre roca caliza, (fr), 5 Apr.–20 May 1996, **T. Núñez & E. Yagual 474** [CB n.s., GUAY n.s., MO, QCNE n.s. (dig. photo)], "árbol 4 m; frutos verdes con 4 semillas; común en camino a casa administrativa"; – Guayaquil, hillside W of the town, [2°10' S, 79°58' W], shrubby hillside, (fl male, fr), 27 Jan. 1955, **E. Asplund 15257** [S], "low but rather coarse shrub; calyx light green; corolla greenish white"; – same area: 4 km W of the town, (fl female), 16 Feb. 1939, **E. Asplund 5004** [S], "low shrub; flowers green"; – same locality: bush-wood, (fl male), 23 Feb. 1939, **E. Asplund 5117** [F, MICH, S], "small tree; flowers green"; – Bosque Protector Cerro Blanco, 150 m, 2°10' S, 79°58' W, bosque seco tropical, (fr), 20 Feb. 1994, **X. Cornejo & C. Bonifaz 1800** [GUAY n.s. (dig. photo)], "árbol 5–6 m; frutos rojos"; – same bosque and coordinates: lower area of reserve, 50 m, in secondary vegetation; on sloping plain below base of mountain; deep soil, derived from limestone; tropical dry forest; secondary, disturbed forest, (fl male, yfr), 1 Mar. 1996, **D. Neill & T. Núñez 10523** [K, MO, QCA n.s. (dig. photo), QCNE n.s. (dig. photo)], "small tree 6 m; corolla with silvery pubescence; fruit green"; – same area: (fr), 11 Dec. 2006, **H. Rainer 1682** [W (fr in alcohol)]; – same bosque and coordinates: 15 km W de Guayaquil, cerro Mirador de los Monos, sendero Canoa, 200 m, 2°10' S, 79°58' W, bosque seco tropical; suelo derivado de roca caliza, (fr), 26 Feb. 1992, **D. Rubio & W. Palacios 2466** [K, MO, NY, QCNE 2× n.s. (dig. photo)], "arbusto 2 m; frutos globosos, verdosos"; – same area, coordinates and ecology: carretera a Salinas, km 15, 200 m, a orillas de carretera, (fr), 15 Aug. 1991, **D. Rubio et al. 1886** [K, GUAY n.s. (dig. photo), MO, QCNE n.s. (dig. photo)], "arbolito 4 m, 6 cm DAP; frutos globosos verdes"; – same data except for: en bosque alterado, (defl male), **1901** [GUAY n.s. (dig. photo), MO n.s., QCNE n.s. (dig. photo)], "arbusto 2 m; flores verdes"; – same data except for: 300 m, (fr), 17 Aug. 1991, **1975** [GUAY n.s. (dig. photo), MO n.s., QCNE n.s.], "arbusto 2 m; frutos globosos verdes"; – Cerro Azul, carretera a Salinas, km 13, 350–500 m, 2°10' S, 79°58' W, bosque seco tropical, transición a bosque húmedo; en pendiente, (fr), 18 Aug. 1991, same collectors **2103** [K, MO, NY, QCNE n.s. (dig. photo)], "arbusto 3 m; frutos globoso verdes"; – Bosque Protector Paraíso, 150 m, 2°12' S, 79°57' W, bosque seco tropical, (fr), 23 Jan. 1994, **X. Cornejo & C. Bonifaz 1370** [GUAY n.s. (dig. photo)], "árbol 4–5 m; frutos rojo obscuro"; – same data except for: bosque secundario, (fl male), 19 Apr. 1997, **5601** [GUAY n.s. (dig. photo)], "árbol 5 m; flores urcioladas cremosas con cáliz verde pubescente"; – Cerros San Eduardo, 140 m, 2°11' S, 79°58' W, [correct is: ca. 2°10' S, 79°55' W], bosque seco tropical, intervenido, (fr), 27 Oct. 1996, **C. Bonifaz & X. Cornejo 3516** [GUAY 2× n.s. (dig. photo)], "arbusto 1–2 m"; – prope Guayaquil, 8 m, [2°10' S, 79°55' W], in sylvulis regionis tropicae, (fl male), s.d., **L. Mille 21** [NY], "arbustus"; – same area: (fr), Jun. 1926, **L. Mille 41** [F, NY, QCA n.s.], "arbustus 2–3 m"; – Guayaquil, cerros del cementerio, 5 m, 2°11' S, 79°53' W, bosque seco tropical, intervenido, (fr), 7 May 1994, **X. Cornejo & C. Bonifaz 1918** [GUAY n.s. (dig. photo), QCNE n.s. (dig. photo)], "árbol 5 m, poco frecuente"; – upper slopes and top of Cerro Carmen (big Christ statue) and saddle between it and Cerro Cementerio, above main cemetery of Guayaquil, in center of old town, 20–50 m, [2°11' S, 79°53' W], xeromorphic, summer-deciduous tropical forest and scrub, with low (10 m) and open canopy, dominated by *Ceiba pentandra* (now mostly cut), *Cochlospermum vitifolium* (now fl., leafless), *Jatropha* (fl. white, tree, early leaf & fl.), *Plumeria alba* (fl., leafless), and understory of *Capparis heterophylla* (no fls whatever, but leafy & with young lvs. coming out), (st), 25 Jul. 1977, **H.H. Iltis & M.G. Iltis E-583** [WIS]; – same data except for: (defl male), **E-584** [WIS]; – vicinity of Durán, [ca. 2°12' S, 79°50' W], (fr), 5–8 Nov. 1918, **J.N. Rose & G. Rose 23607** [F, GH, NY, US]; – Guayaquil, hills near Estero Salado, ca. 50 m, [2°16' S, 79°53' W], (fr), 23 Oct. 1958, **G. Harling 3049** [S], "shrub"; – Cerro El Paraíso, 2°18' S, 79°53' W, bosque seco tropical, secundario, (fl male), 16 Sep. 2000, **C. Bonifaz 4046** [GUAY n.s., W (fl in alcohol)], "árbol 2 m; flores verdosas de 14 mm; cáliz 7 mm, verde más oscuro"; – same Cerro: 150 m, bosque seco tropical, secundario, (fl male, fr), 10 Jun. 2000 (fruits: 16 Sep. 2000), **C. Bonifaz & X. Cornejo 4047** [GUAY n.s. (dig. photo), W (fr in alcohol)], "árbol 4 m, 10 cm de DAP; frutos verdes y café oscuro (desde 2.2 hasta 2.5 cm); cuando los frutos están maduros presentan un color marrón o sea café oscuro; por lo cual en el mismo árbol se encuentran frutos de diferentes colores; flores crema"; – same Cerro: 0–20 m, (fr), 1964, **F.M. Valverde 504** [COL n.s. (dig. photo), US], "árbol 8 m; frutos rojos con 4 semillas; cáliz persistente"; – Reserva Ecológica Andrade, 130 m, 2°24' S, 79°40' W, bosque seco transicional a húmedo tropical en recuperación, (fl male), 26 May 2001, **X. Cornejo & C. Bonifaz 7173** [GUAY n.s. (dig. photo), QCNE n.s. (dig. photo)], "arbusto ó arbolito 1,5–2 m; flores

verdosas; con flores y fruto en esta fecha"; – Naranjal, Reserva Ecológica Manglares – Churute, cerca de la cumbre del Cerro Pancho Diablo de frente al Puerto del Gallo, 610–590 m, 2°25' S, 79°35' W, topografía colinada; suelo claro con escasas piedras, (fr), 13 Aug. 1992, **C.E. Cerón 20153** [MO n.s., QAP n.s., W], "arbusto de 3 m; frutos redondos de 2 cm de diámetro, color verde"; – same Cerro: 20 m, 2°25' S, 79°39' W, bosque seco tropical, secundario, (fr), 3 May 1996, **X. Cornejo & C. Bonifaz 5073** [GUAY n.s. (dig. photo)], "árbol 4 m; frutos verdes"; – same Reserva: Naranjal, Parroquia Taura, Cerro Perequetre Chico, 160–300 m, 2°27' S, 79°40' W, bosque disturbado, (fl male), 26 Feb. 1992, **C.E. Cerón et al. 18247** [MO n.s., QAP n.s., W], "árbol de 6 m; flores verde-agua"; – not traced: road Guayaquil to Salinas, near first bridge, 7 m, arid, dry hillside, (fr), 10 Dec. 1934, **Y. Mexia 6749** [F, NA n.s., NY, UC, US], "shrub 3–5 m high, common"; – Carretera Salina R6, (fr), Apr.–May 1962, **A. Marmol 49** [GB, MO n.s., WIS], "árbol; flor blanca"; – Isla Puná, Puná Nueva to La Polvora, 0 m, 2°44' S, 79°55' W, semi-deciduous forest, (fr), 3 Dec. 1987, **J.E. Madsen 64149** [AAU, QCNE n.s. (dig. photo)], "shrub 3 m high; fruits red"; – same Isla: vicinity of La Polvora, 0–50 m, 2°46' S, 79°54' W, dry forest close to beach, (fr), 12 Oct. 1988, **J.E. Madsen et al. 75487 (75487A)** [AAU, QCA n.s., W], "treelet 4 m high; fruits red"; – Cantera San Luis [not traced], 100 m, 3°10' S, 79°55' W [not correct], bosque seco intervenido, (fr), Dec. 1995, **F.T. Alumnos s.n.** [GUAY n.s. (dig. photo)], "árbol 5 m".

Peru, Cajamarca, Jaén, Dist. Santa Rosa, alrededores del Cerro Casapita, 1200–1335 m, 5°26'54" S, 78°34'12" W, relictos de bosque seco, dominados por Fabaceae; bordes de caminos, (defl female, yfr), 22 Mar. 2006, **E. Ortiz V. & J. Mateo M. 1136** [AMAZ n.s., HUT n.s., MO n.s., MOL n.s., USM n.s., W], "árbol 6 m; frutos verdes". – San Martin, Alto Río Huallaga, Juanjui, 400–800 m, [7°11' S, 76°45' W], forest, (fl male), Mar. 1936, **G. Klug 4270** [A, BM, F, K, MO, NY, S, U, UC], "tree 8 m; fls. cream-green". – Ucayali / Huánuco, Bosque Nacional "Alexander von Humboldt", carretera Pucallpa – Lima "Federico Basadre", 30 m al este del camino al campamento, 300–500 m, 8°20'–9°35' S, 74°54'–75°35' W, [ca. 8°45' S, 75°8' W], (flbuds male), 5 May 1975, **G.S. Hartshorn et al. 1667** [DAV, MO], "25 m, 40 cm dap". – Huánuco, Prov. Puerto Inca, Dtto. Yuyapichis, DANTAS (Unidad Modelo de Manejo y Producción Forestal), 270 m, 9°40' S, 75°2' W, bosque húmedo tropical, 2500 mm PMA, 23.5° C TMA; bosque de lomadas, colinas bajas y terrazas altas, (fl male), 22 Dec. 1989, **Flores & A. Tello 374** [G, NY], "árbol 25 m, 41 cm dap."; – same data except for: (fl male), 21 Jan. 1991, **A. Tello 1250** [G, MO, NY], "27 m, 36 cm dap.". – Madre de Dios, Prov. Manu, Parque Nacional de Manu, near Cocha Cashu station on an old ox-bow lake of the Río Manu, [11°53' S, 71°24' W], forest, (fr), 17 Aug. 1973, **R.B. Foster 2640** [CAS, F n.s. (photocopy), GH, K, MO, NY, U, US], "tree 20 m; fruit green, unripe"; – same locality and coordinates: 350 m, floodplain forest, (fr), 18 Jul. 1984, **R.B. Foster 9653** [CUZ n.s., F n.s. (photocopy), FHO, MO, W], "tree 10 m; fruits still green"; –same place: (fr), 27 Sep. 1976, **R.B. Foster & J. Terborgh 5078** [CUZ n.s., F], "tree 90 ft.; fruit green with rosy tinge"; – same area: Cocha Totora, east of Cocha Cashu, 300–400 m, 11°50' S, 71°25' W [ca. 11°53' S, 71°24' W], floodplain, old *Ficus-Cedrela* forest, (st), Jul. 1984, **R.B. Foster & J. Arce 11117** [F], "juvenile"; – Cocha Cashu uplands, 400 m, 11°45' S, 71°0' W [correct is: ca. 11°53' S, 71°24' W], (fr), 19 Jul. 1986, **P. Núñez 5450** [FHO, MO, W], "tree 30 m; fruits green, sweet pulp, 6 seeded"; – Cocha Salvador, 370 m, [11°58' S, 71°15' W], (st), 19 Oct. 1991, **P. Núñez et al. 14462** [CUZ n.s. (dig. photo), MO, W], "sterile tree, dbh 12 cm; orange slash"; – Manu Province, Puerto Maldonado, Los Amigos Biological Station, Madre de Dios River, ca. 7.0 km upriver from mouth of Río Los Amigos, trocha Lindero, 270 m, 12°57' S, 70°01' W, old growth, lowland tropical to subtropical moist forest, lower terrace, younger floodplain, some areas seasonally inundated; soil moist, dark, alluvial with sand, (fr), 2 Oct. 2002, **A.P. Maceda 52** [BRIT n.s. (dig. photo), USM n.s., W], "árbol 6 m; frutos maduros rojos"; – same area and coord.: trocha Carretera-Potrero, secondary vegetation along edges of man-made road trail; soil moist, sandy, clay, (fr), 27 May 2003, **A.P. Maceda 677** [BRIT], "árbol 5 m; frutos maduros rojos"; – Tambopata Province, Río Tambopata, Comunidad Nativa de Infierno: Hermosa Chica, 260 m, 12°50' S, 69°17' W, primary, non-flooded, subtropical moist forest; brown clay soil, seasonally waterlogged, (fr), 12 Jul. 1989, **M. Alexiades & C. Díaz 801** [FHO, MO 2×, NY n.s.], "tree to 20 m; fruits spheroid, hard, green"; – same data except for: (fr), 13 Jul. 1989, **C. Díaz & M. Alexiades 3653** [MO, W], "árbol 20 m; frutos verdes; cáliz persistente con indumento ferrugíneo"; – Puerto Maldonado, riveras del Río Madre de Dios, [ca. 12°35' S, 69°10' W], (fr), 19 Jul. 1989, **C. Díaz & R. Vásquez 3670** [MO, W], "árbol 18 m; frutos verdes y rojos"; –Cuzco Amazónico, across Río Madre de Dios on road to Lago Sandoval, 200 m, 12°35' S, 69°05' W, (fl female, yfr), 19 Dec. 1989, **A.H. Gentry et al. 68986** [CUZ n.s. (dig. photo), FHO, MO, W], "tree 8 m; young fruits greenish"; – same data except for: (fl female), **68996** [CUZ n.s. (dig. photo), FHO, MO, W], "tree 6 m; flowers greenish cream"; – same area: trail to Lago Sandoval across Río Madre de Dios, ca. 12 km E of Puerto Maldonado, 200 m, 12°35' S, 69°04' W, (fr), 21 Feb. 1990, **A.H. Gentry & P. Núñez 69352** [CUZ n.s. (dig. photo), FHO, MO, W], "tree;

fruits green"; – Cuzco Amazónico Lodge, 15 km NE of Puerto Maldonado, 200 m, 12°35' S, 69°03' W, (fr), 18 Jun. 1990, **P. Núñez 12238** [CUZ n.s. (dig. photo), MO, W], "tree 20 m; convoluted trunk; fruits green, bark orange"; – 10 km NE of Puerto Maldonado, Lago Sandoval, 400 m, 12°35' S, 69°03' W, lake edge, ravines; aguajal; roadside, (fr), 28 Jun. 1990, **P. Núñez 12369** [CUZ n.s. (dig. photo), MO, W], "small tree 6 m, 10 cm dbh; fruits green"; – Tambopata, Distrito Las Piedras, Reserva Amazónica, Trocha Canopy, Jardín Botánico, 193 m, 12º31'51" S, 69º02'42" W, bosque primario, (fr), 14 Jul. 2007, **L. Valenzuela & J. Farfán 9870** [F n.s. (dig. photo), MO n.s., W], "árbol 40 m; frutos verdes".

Bolivia, Pando, W bank of Rio Madeira, 2 km N of Abunã, [9°41' S, 65°23' W], forest on terra firme, (fr), 16 Jul. 1968, **G.T. Prance et al. 6116** [FHO, INPA, NY n.s., W, WIS], "tree 15 m × 15 cm diam.; fruit green". – La Paz, Chaquimayo-Apolo trail ca. 15 km NW of Apolo, near Río Machariapo, 1400–1500 m, 14°34' S, 68°28' W, small patch of cerrado vegetation, (flbuds female, fr), 13 Jun. 1990, **A.H. Gentry & R. Foster 71174** [FHO, LPB 2×, MO, NY, W], "tree 4 m; fruits green" [adaxial leaf surface of the specimen at LPB ± reticulate!]; – Franz Tamayo, Parque Nacional y Área Natural de Manejo Integrado Madidi, serranías de los alrededores de San Buenaventura, 250 m, 14°26'20" S, 67°32'11" W, bosque amazónico preandino, (fl male), 3 Dec. 2004, **A. Araujo M. et al. 1340** [MO n.s., W], "árbol 15 m; botones verdes a crema; flores amarillas; frutos inmaduros verdes". – Beni, Cachuela Esperanza, [10°33' S, 65°36' W], trop. Regenwald; kleiner Schattenbaum der Alturas, (flbuds male), 30 Sep. 1923, **G. Meyer 91** [Z]; – Prov. Itenez, Magdalena, 13°21' S, 64°8' W, (fr), 11 Apr. 1979, **A. Krapovickas & A. Schinini 34768** [C, CTES, F, G, MICH, MO, NY], "árbol 5 m"; – Prov. Ballivián, Espíritu, zona de influencia del Río Yacuma, 200 m, [14°12' S, 66°37' W], sabana húmeda; altura sin inundación normalmente, (fr), 29 Mar. 1988, **S.G. Beck 15165** [LPB n.s., W], "arbusto 4 m"; – same locality and collector: al borde de la isla joven, (fr), 18 Apr. 1980, **3469** [FHO, LPB n.s., MG, MO, USZ n.s. (dig. photo), W], "arbusto 3 m; frutos axilares, 1 cm de diam."; – (fr), 15 Oct. 1980, **5081** [FHO, LPB n.s., W], "arbusto 3,5 m"; – isla joven; bosque de media altura, (fl male), 20 Oct. 1980, **5219** [MG n.s., LPB n.s., W], "árbol 6 m; ramas largas y anchas, cauliflor"; – (st), 15 Apr. 1981, **5402** [FHO, LPB], "arbusto 4 m"; – sabana húmeda; isla de bosque abierto, espinoso y caducifolia, (st), 12 Sep. 1986, **5995** [LPB], "árbol 7 m"; – Isla de Sumuqué, 200 m, sabana húmeda, ocasionalmente inundable, (st), 15 Mar. 1990, **15205** [LPB n.s., W], "árbol 20 m, DAP 25 cm; tronco inclinado"; – Prov. Cercado, Estancia La Chacra, 20 km E de Trinidad sobre el camino a Santa Cruz, 180 m, [ca. 14°49' S, 64°43' W], sabana temporalmente inundadas; isla de 60 m de diámetro, surcada de junquillos; isla n° 4, (fl male), 28 Sep. 1993, **R. Langstrhrot 68** [USZ 2× n.s. (dig. photo)], "arbolito de 2–3 m". – Santa Cruz, Prov. José Miguel de Velasco, Parque Nacional Noel Kempff Mercado, lado norte de la serranía Huanchaca, 14 km al SE de la Estación Flor de Oro, 260 m, 13°30' S, 61°00W, [correct is: ca. 13°37' S, 60°57' W], bosque tropical sub-húmedo, medio abierto de 25 m, (fr), 8 Mar. 1992, **A. Perry & E. Cuellar 669** [BOLV n.s., E, LPB, MO, NY, USZ n.s. (dig. photo)], "árbol 7 m, diam. 10 cm; corteza gris-café; madera externa anaranjada, interna amarilla; frutos verdes; cáliz verde"; – same area: S de la pista Noel Kempff M., 360 m, 13°54'22" S, 60°48'52" W, cerrado denso, (fr), 7 Jun. 1994, **B. Mostacedo et al. 2086** [MO, USZ n.s. (dig. photo)], "arbusto 3 m; fruto rojo inmaduro"; – Prov. Guarayos ("Ñuflo de Chávez"), Reserva de Vida Silvestre, "Ríos Blanco y Negro", Perseverancia, cerca 8 km N del campamento, 253 m, 15°37' S, 64°42' W, [correct is: ca. 14°28' S, 62°27' W], bosque húmedo tropical, influenciado por el rio Negro, (fr), 28 Jun. 1992, **M. Saldias et al. 1526** [F n.s. (dig. photo + photocopy), USZ n.s. (dig. photo)], "arbusto 3 m; frutos rojos, redondos, de 1,5 cm de largo por 1,5 de diámetro"; – same area: senda al chaco, 1 km NW Perseverancia, 200 m, 14°38' S, 62°37' W, [correct is: 14°43' S, 62°49' W], (fr), 13 Jun. 1990, **I.G. Vargas 612** [USZ n.s. (dig. photo)], "arbusto 3 m; tallo de 7 cm de diámetro; con frutos verdes glabros"; – same area: edge of airstrip, 275 m, 14°44' S, 62°48' W, edge of secondary growth, (fr), 11 Sep. 1990, **M. Nee 38732** [FHO, LPB, MADw n.s., NY, U, USZ n.s. (dig. photo)], "small tree 6.5 m, 7 cm diam.; mostly with young leaves; a few branches with old mature leaves, the old leaves dark green above, light green below; fruit green, turning purple-red"; – Velasco Province, Reserva Ecológica El Refugio, a 100 m al N del campamento Refugio, 180 m, 14°44'19" S, 61°00'17" W, en Barbecho; suelos arcillo-limosos con afloramiento de roca, (fr), 20 Feb. 1995, **R. Guillén & V. Roca 3213** [CTES, LPB, MO, NY, USZ n.s. (dig. photo)], "árbol de 4 m; frutos verdes"; – same area: a 150 m al SE del campamento Refugio, 180 m, 14°46'15.5" S, 61°01'53.6" W, bosque húmedo de altura; suelos franco arcillosos con presencia de arena, (st), 28 Apr. 1995, **R. Guillén & R. Choré 3386** [MO, USZ n.s., W], "arbusto 3,5 m; frutos verdes"; – same data except for: (flbuds), **3388** [USZ n.s. (dig. photo)], "árbol 7 m; flores en botones"; – same area and coord.: a 2500 m al SE del campamento Refugio, sobre el sendero abandonado, 180 m, suelos arcillo-limosos, (fr), 29 Apr. 1995, **R. Guillén & V. Roca 3398** [E, MO, NY, USZ n.s.], "árbol 5 m; frutos verdes"; – Prov. Guarayos, 3 km S de Ascensión de Guarayos, Ayo. San Joaquín, 250 m, 15°43' S, 63°6' W, (fr), 27 Apr. 1977, **A. Krapovickas & A. Schinini 31830** [CTES], "árbol 2–3 m";

– Ascensión (Misiones de Guarayos), [15°42' S, 63°5' W], Buschwald, (fr), Aug. 1907, **T.C.J. Herzog 300** [Z], "Strauch"; – Empresa Forestal La Chonta, 400 m, 15°41' S, 62°46' W, bosque húmedo de llanura, (yfr), 17–25 Nov. 2000, **M. Toledo et al. 1410** [MO n.s., USZ n.s., W], "árbol de 9 m; fuste cilíndrico; corteza externa fisurada, negruzca la interna crema; [hojas:] envés verde claro pubescente; frutos verdes"; – San Ramón, ladera del Cerro Puquio Sur, 500 m, 16°38'15" S, 62°27' W, (fr), 6 Jul. 1991, **R. Quevedo & T. Centurión 594** [LPB, MO, USZ n.s. (dig. photo)], "planta 3–4 m, 6 cm d.a.p."; – Prov. Santiesteban, 12.2 km N of Mineros, 280 m, 17°01' S, 63°13'15" W, grassy and brushy roadsides and adjacent pastures, very flat, almost all cleared for fields of rice, sugarcane, etc.; soil fine sandy, (fr), 20 Feb. 1994, **M. Nee 45071** [NY, USZ n.s. (dig. photo)], "small tree or shrub; fruit and fruiting calyx green"; – Prov. Warnes, at Puente Las Chacras on the Montero-Okinawa hwy., 14 km ENE from hwy. junction just N of Montero, 275 m, 17°17' S, 63°09' W, brushy areas and disturbed woods along channel, (fr), 26 Dec. 1997, **M. Nee 47554** [NY n.s., USZ n.s. (photo)], "small tree 5 m tall, 10 cm in diameter; fruit green"; – 10 km WSW of Colonia Okinawa No. 1, and 1.5 km ENE of El Tajibo along hwy. from Montero to Colonia Okinawa No. 1, 250 m, 17°14' S, 62°59' W, grazed and disturbed semi-deciduous forest remnant at bridge construction site, (fr), 7 Jan. 1996, **M. Nee 46770** [CTES, NY, USZ n.s.], "tree 7 m tall, 16 cm diam.; fruit and fruiting calyx green"; – E side of the village of Colonia Okinawa 1, 250 m, ca. 17°14' S, 62°53' W, brushy flat areas, formerly forest, (fr), 28 Jan. 1987, **M. Nee 33834** [FHO, LPB, NY], "slender shrub 3 m; leaves dark green above, green below; fruit green"; – Prov. Ichilo, 2 km W of El Cairo and 6 km W of Buena Vista, 325 m, 17°28' S, 63°43' W, secondary tropical evergreen moist forest remnants on flat area, (fl male), 5 Dec. 1989, **M. Nee 37954** [FHO, LPB, MO, NY, USZ n.s. (dig. photo)], "small tree 9 m, 18 cm diam.; flowers light yellow"; – same data except for: (fl female), **37955** [LPB, MO, NY, USZ n.s. (dig. photo)], "small tree 8 m, 12 cm diam.; young fruiting calyx and fruit green"; – 2 km WSW of Buena Vista on road to El Cairo, 340 m, 17°27'30" S, 63°41' W, rolling terrain, former lowland tropical evergreen forest, now mostly in orchards, (fr), 30 Jan. 1988, **M. Nee & G. Coimbra S. 36094** [LPB, NY], "shrub 4 m; fruit green"; – Prov. Sara, bosque de Buena Vista, 450 m, [17°27' S, 63°40' W], (fl male), 24/25 Nov. 1925, **J. Steinbach 7340** [A, BM, E, F, G, GH, K, MO, NY, S, U, Z], "arbolito 5 m; cáliz verde; corola blanca-gris afuera, castaño-morado, amarillenta por adentro en la boca; estambres morado-rosáceos"; – same data except for: (fr), 2 Oct. 1925, **7253** [A n.s., BM, E, F, G, GH 2×, K, MO, S, U, Z], [GH:] "altura aproximada del árbol mediana magnitud; fruteando; fruta verde-castaña; semillas castaña-obscuras-relumbrantes; cáliz de la fruta verde-gris; tiene la fruta la forma de una perfecta bola"; – Buena Vista, Río Palometillas, 400 m, [ca. 17°24' S, 63°38' W], bosque, (fl male), 29 Dec. 1925, **J. Steinbach 7362** [A, BM, F, G, K, MO, S], "arbusto 4 m; cáliz verde; corola amarillenta con boca verde-morada"; – Prov. Ichilo, Parque Nacional Amboró, Buena Vista 5 km hacia el Río Surutú, cruzando el Río, [17°28' S, 63°40' W], bosque mediano, con árboles de 15–20 m; suelo franco arenoso, (fr), 15 Jun. 1995, **B. Mostacedo et al. 3270** [CTES, LPB, NY, USZ n.s. (dig. photo)], "árbol 6–7 m; corteza externa escamosa, crema grisácea, interna amarillenta; fruto verde inmaduro, rojo cuando maduro; semillas cubiertas de un arilo marrón transparente"; – 1 km SW of center of Buena Vista, on slope between town and Río Surutú, 350 m, 17°28' S, 63°40' W, open pasture with some remnant trees, originally tropical evergreen forest; sandy soil; on slope, (yfr), 7 Dec. 1990, **M. Nee & I. Vargas C. 40218** [FHO, LPB, NY, USZ n.s. (dig. photo)], "small tree 7 m, 18 cm diam.; bark finely longitudinally scaly; immature fruiting calyx green"; – same data except for: (fl male), **40219** [FHO, LPB, NY, USZ n.s. (dig. photo)], "small tree 15 cm diam.; bark smooth, slightly shallowly longitudinally scaly; flowers hanging, closed, white"; – same data except for: 360 m, open pasture, secondary forest, (fr), 16 Feb. 1991, **O.W. Stutter 87** [USZ n.s. (dig. photo)], "8 m height, 20 cm diameter; dark grey smooth bark"; – 4 km SW of Buena Vista, S side of Río Surutú, 315 m, 17°39' S, 63°41' W, partly disturbed evergreen tropical forest just above floodplain, (fl male), 20 Oct. 1990, **M. Nee 39379** [COL n.s. (dig. photo), FHO, LPB n.s., NY, USZ n.s. (dig. photo)], "tree 20 cm diam.; bark finely rectangular-flaky; flower buds greenish-white"; – 1–2 km NE of El Carmen on trail to crossing of Río Surutú, 350 m, 17°31' S, 63°41' W, disturbed brush and remnants of tropical evergreen forest, now mostly in agriculture and pastures, (fr), 21 Jul. 1991, **M. Nee 41794** [FHO, LPB, NY, USZ n.s. (dig. photo)], "small tree; fruit green"; – patio del Hotel Amboró del Sr. Robin Klarke (2 km al W de Buena Vista, por el camino al Cairo), ca. 370 m, 17°31' S, 63°41' W, bosque muy intervenido, (fl male), 4 Oct. 1996, **I.G. Vargas C. & M. Saldias 5380** [NY n.s., USZ n.s., W], "arbusto 3–4 m; tallo 5–8 cm diam. basal, ramificado desde la base; copa irregular con flores axilares de pétalos blancos"; – 4.5 km SSE of Buena Vista, forest around Hotel Flora y Fauna, 400 m, 17°29'50" S, 63°38'40" W, secondary semi-evergreen forest; in secondary growth about 2 years old, (fr), 14 Jan. 2006, **M. Nee & J. Wen 53793** [NY n.s., W], "shrub 2.5 m; fruit green, one apparently ripe and reddish"; – Prov. Warnes, 8 km WNW of Warnes, 2 km E of Juan Latino, 0.5 km W of Montero-Warnes highway, 320 m, 17°27' S, 63°12' W, flat, sandy pasture and scrub, (fl male), 10

Nov. 1990, **M. Nee 39916** [CTES, FHO, LPB, MO n.s., NY, USZ n.s. (dig. photo)], "shrub 2 m tall; flowers hanging; calyx green; corolla white in bud"; – 13 km NE of Warnes on road to La Esperanza, 300 m, 17°25' S, 63°04'30" W, flat, fine sandy soil, mostly pastures and short woodlands, (fr), 11 Jul. 1994, **M. Nee 45166** [NY, USZ n.s. (dig. photo)], "shrub 3 m; fruit green"; – Prov. Ichilo, 3 km WSW of El Hondo, 400 m, 17°40'20" S, 63°27'25" W, secondary forest N of the buildings, (fr), 13 Feb. 1994, **M. Nee & I. Vargas C. 44934** [NY, USZ n.s. (dig. photo)], "treelet 5 m, 10 cm diam.; fruit abundant, green"; – Rio Pirai [= Rio Piray], [ca. 17°40' S, 63°20' W], Uferwald, (fr), Jan. 1911, **T.C.J. Herzog 1463** [G-DEL, S, W 2×, Z], "kleiner Baum"; – Prov. Andrés Ibañez, Pampas del aeropuerto Viru Viru, 380 m, 17°39' S, 63°08' W, sabanas con predominancia de Gramineas, con pequeñas islas de bosques, (yfr), 16 Dec. 1994, **B. Mostacedo & J. Lopez 2581** [LPB, NY, USZ n.s.], "árbol 6–7 m; fruto verde inmaduro"; – Parque Nacional Amboró (límite S), Nueva Palestina, 35 km W (línea recta) del centro de Santa Cruz, orilla Río Surutú, 480 m, 17°46' S, 63°32' W, bosque subhúmedo subtropical, (fr), 2 Mar. 1990, **M. Saldias et al. 996** [CTES, MO, NY, USZ n.s. (dig. photo)], "arbusto de 4 m y 10 cm de diam.; corteza delgada; fruto verde"; – loc. Urbanización Monteverde, 3,5 km SW del centro de Sta. Cruz, 415 m, 17°48' S, 63°20' W, (fr), 12 May 1991, **M. Saldias & Y. Roca 1357** [FHO, NY, USZ n.s.], "árbol 6–7 m, 15 cm dap; corteza gris, estriada; fruto verde-claro, con cáliz persistente de color verde oscuro"; – zona W de la ciudad Santa Cruz, camino a Terevinto, laguna de Urubó, 5 km W del Río Piraí [= Rio Piray], 250 m, 17°45' S, 63°16' W, bosque semicaducifolio; suelos arenosos, superficiales, (fl male), 14 Nov. 1994, **B. Mostacedo & A. Jimenez 2539** [LPB, NY, USZ n.s.], "árbol 5 m, 15 cm dap; flores con cáliz verduscas y corola blanca"; – Laguna El Urubó, 4–5 km W de la ciudad de Santa Cruz, 250 m, 17°45'40" S, 63°16'27" W, (fr), 22 Jan. 1995, **B. Mostacedo & L. Paredes 2619** [NY, USZ n.s.], "árbol 8–10 m, 15 cm de DAP; fruto verde inmaduro"; – SW side of Santa Cruz near Río Pirai [= Rio Piray], 6 km SW of center of Santa Cruz, 425 m, 17°48' S, 63°14' W, sandy, disturbed brushy areas, formerly subtropical, semi-deciduous forest, (flbuds female, yfr), 28 Nov. 1988, **M. Nee 36937** [FHO, LIL n.s. (dig. photo), LPB, NY, USZ n.s. (dig. photo)], "shrub 4 m, 8 cm diam.; calyx and immature fruit green"; – same area: 17°46' S, 63°13' W, riverbed plants and nearby semi-deciduous forest; river almost dry except near margins; rare on steep riverbank, (fl male), 15 Nov. 1989, **D.C. Daly & S. Strickland 6232** [FHO, LPB n.s., NY n.s., USZ n.s. (dig. photo), W], "tree 6 m; contorted habit, profusely branching; flowers (almost all in bud) oriented downward; corolla white"; – W side of Santa Cruz, edge of floodplain of Río Piraí [= Rio Piray], 400 m, 17°47' S, 63°13' W, flat, sandy, brushy, grassy or weedy areas, (fl male), 11 Jan. 1987, **M. Nee 33420** [LPB, NY], "shrub 2.5 m tall; flowers hanging; corolla yellowish but none fully open (mid-afternoon)"; – Centro de Santa Cruz, 300 m N del 2do anillo, sobre la carretera a Montero, 416 m, 17°46' S, 63°11' W, bosque subhúmedo tropical, (fl male), 22 Mar. 1990, **M. Saldías 1044** [USZ n.s. (photo)], "árbol de 6 m; 20 cm de diámetro basal; bifurcado desde la base; cáliz verde y corola amarillo-claro"; – same city: alrededores del Country Club "Las Palmas", (fr), 12 Apr. 1980, **A. Krapovickas & A. Schinini 36112** [CTES, MO], "árbol de 2–3 m; flores blancas"; – a large (ca. 10–15 hectares) wetland complex, across the highway from the international airport, ca. 430 m, [17°49' S, 63°10' W], growing in a small upland area above the pond; surrounding vegetation: a matrix of fields with patches of secondary forest, (yfr), 14 Jan. 1996, **N. Ritter 2778** [GH n.s., LPB n.s., MO n.s., NHA 2×, W], "tree up to 5 m; a few individuals were noted"; – 7 km SSE of center of Santa Cruz, 410 m, 17°50' S, 63°09' W, disturbed areas of former subtropical semideciduous forest, around brick pits and brickyard, (fl female), 7 Dec. 1988, **M. Nee 37029** [LPB, NY, USZ n.s. (dig. photo)], "shrub 2 m; flowers held at downward angle; calyx yellow-green; corolla creamy greenish white"; – Prov. Florida, bottom of valley of Río Achira and steep slopes above highway from Santa Cruz to Samaipata, near cemetery near Achira, 1300 m, 18°10' S, 63°47' W, disturbed forest, (fr), 1 Feb. 1998, **M. Nee 48220** [NY n.s., QCA n.s. (dig. photo), SPF n.s. (dig. photo), USZ n.s. (dig. photo)], "shrub 3 m tall; fruit green, hanging"; – Prov. Andrés Ibañez, Cotoca, 3 km W de Paurito, camino a Santa Cruz, [17°49' S, 63°3' W], (fr), 6 Aug. 1994, **B. Mostacedo 2218** [NY, USZ n.s.], "árbol 5 m; fruto verde inmaduro"; – 3 km NW of center of Cotoca, at bridge aver Arroyo Calleja, 375 m, 17°44' S, 63°00'30" W, now with no running water, only stagnant pools; disturbed subtropical semideciduous forest and brushy areas, (fl female), 21 Dec. 1989, **M. Nee 38220** [LPB, MO, NY], "shrub 3 m tall; leaves dark green, slightly glossy above; immature fruiting calyx green"; – La Guardia, 5 km hacia el S, 630 m, 17°30' S, 63°24' W, [correct is: 17°56' S, 63°21' W], quebrada seca; bosque p.p. caducifolia, (fr), 8 Jan. 1998, **S.G. Beck 23439** [LPB], "árbol 5,0 m con frutos"; – along highway from Santa Cruz to Abapó, 3 km to Abapó, 3 km S of crossing of railroad and 2 km S of bridge over quebrada Pejí, 450 m, 17°58' S, 63°11' W, grassy, sandy dune fields with patches of shrubs and low forest, grazed but still quite natural, (fl female, fr), 27 Feb. 1998, **M. Nee et al. 48479** [NY n.s., USZ n.s. (photo)], "shrub; fruit green"; – Prov. Florida, at Achira Camping resort, 1370 m, 18°9'53" S, 63°48'80" W, dry forest; in bottom of valley, (fr), 18 Apr. 2002, **M. Nee 52196** [USZ

n.s. (dig. photo)], "small tree 6 m tall, 14 cm in diameter; fruit green"; – Jardín Botánico de Santa Cruz, 12 km E of Center of Santa Cruz on road to Cotoca, 375 m, 17°46' S, 63°04' W, agricultural field abandoned ca. 1984; apparently at least two here in shrubby second growth of franja B and central path, (fr), 3 Apr. 1998, **M. Nee 48820** [COL n.s. (dig. photo), NY n.s., USZ n.s. (dig. photo)], "shrub 1.4 m tall; fruit and fruiting calyx yellow-green, hanging"; – same place: (fl male), 9 Oct. 1977, **G. Hartshorn & E. Meneces 2013** [FHO, LPB], "6 m, 15 cm DAP; flor crema blanca"; – same data except for: (flbuds female), **2014** [FHO, LPB], "7 m, 20 cm DAP; corteza interna amarilla"; – same place: (fr), 21 Apr. 1977, **A. Krapovickas & A. Schinini 31615** [CTES, G], "árbol 3 m"; – 2.5 km by dirt road S from turnoff from Bermejo-Samaipata highway, above Quebrada La Coca, 1150 m, 18°09' S, 63°41' W, dry forest on slope above quebrada, (fl male), 6 Nov. 1999, **M. Nee 50503** [NY n.s., USZ n.s. (dig. photo), W], "treelet 6 m tall, 14 cm in diameter; flower buds hanging".

Brazil, Acre, Mun. de Cruzeiro do Sul, alto rio Juruá, margem esquerda, localidade Volta Grande, ca. 9°8' S, 72°45' W, mata de terra firme; solo arenoso, (fr), 19 Mar. 1992, **C.A. Cid Ferreira et al. 10870** [FHO, INPA n.s. (dig. photo), K, NY n.s., W], "árvore 10 m × 24 cm diam.; frutos imaturos verdes"; – Município de Marechal Thaumaturgo, Reserva Extrativista do Alto Juruá, acima da foz do Igarapé Caipora, em frente a Faz. Natal, margem esquerda, ca. 9°19' S, 72°40' W, floresta de terra firme; terreno plano, (fr), 6 Apr. 1993, **M. Silveira et al. 485** [K, NY n.s., W], "árvore 20 m, pouco frequente; frutos imaturos verdes claros; cálice persistente verde obscuro"; – Basin of Rio Purus, near mouth of Rio Macauhan [= Macauã] (tributary of Rio Yaco [= Iaco]), lat. 9°20' S, long. 69° W, [9°15' S, 68°45' W], on varzea land (shore of river), (fl female, fr), 26 Aug. 1933, **B.A. Krukoff et al. 5653** [A n.s., BM, F, G 2×, K 2×, LE n.s., LP, M, MICH, MO, NY 2×, RB n.s. (dig. photo), S, U, UC], "tree 45 ft. high, 5.5 in dbh"; – Mun. Sena Madureira, Rio Macauã, Seringal Riozinho, Colocação Provenir, 9°43' S, 69°07' W, mata de terra firme; sub-bosque denso; solos pouco drenados, (fr), 1 Apr. 1994, **L. de Lima et al. 564** [K, NY n.s., W], "árvore ca. 15 m; frutos imaturos verdes"; – Mun. Porto Acre, Reserva Florestal do Humaitá-UFAC, [9°45' S, 67°38' W], terra firme, capoeira, (fr), 21 Jun. 1994, **A.R.S. Oliveira 259** [NY n.s., W], "árvore com 10 m; parece angelca; com casca mais fina"; – Rio Iaco, right bank, Nova Olinda, between Igarapé Santo Antõnio and Ig. Boa Esperança, 10°7' S, 69°13' W, (fl female), 23 Oct. 1993, **D.C. Daly et al. 7876** [NY n.s., W], "tree 22 m × 40 cm, rare; outer bark gray, rough, thick, inner bark tan; leaves with several round translucent glands near base of blade; buds pale green"; – Mun. Rio Branco, Basin of Rio Purus, Riozinho do Rola, "Piçarreira", "Barro Alto", river at record flood level, ca. 10°03'15" S, 68°00'20" W, terra firme forest on hilly terrain dissected by many streams; soil clayey, (fr), 15 Mar. 1997, **D.C. Daly et al. 9552** [NY n.s., W], "tree 8 m × 10 cm; outer bark dark brown, finely and shallowly reticulate-fissured, thin, inner bark white but quickly oxidizing bright yellow"; – estrada AC40, cerca de 20 km de Rio Branco, [ca. 10°11' S, 67°47' W], área de pasto, (fr), 27–28 Apr. 2010, **H. Medeiros et al. 560** [NY n.s., W], "árvore 10 m; cálice esverdeado; fruto imaturo verde"; – Mun. Xapuri, Reserva Chico Mendes, Seringal Boa Vista, Colocação Santa Rosa, [10°37' S, 68°29' W], mata primaria; terra firme; solo arenoso-argiloso, (fl male), 10 Dec. 1993, **C. Figueiredo 213** [NY n.s., W], "árvore 15 m; casca amarela; inflorescência umbela; cálice verde e corola branca" [leaves quite young, reticulate adaxially; hairs ferruginous on the corolla]; – Rio Acre, Porvir, [10°55' S, 68°37' W], campo artificial, (fl male), 15 Nov. 1923, **J.G. Kuhlmann 817** [MG, RB n.s. (dig. photo), W], "árvore 2 m (naturalmente brotada de tronco velho); flores alvas-creme"; – Mun. Brasiléia, upper Rio Acre, left bank, 10°57'25"–11°00'49" S, 69°10'35"–68°52'11" W, forest on low levees and backsloping terraces that are inundated supra-annually; canopy discontinuous, understory with high density of *Heliconia* and Marantaceae, (fl male), 22 Mar. 1998, **D.C. Daly et al. 9713** [NY], "treelet 5 m; bifurcation from 30 cm, each of these 5 cm diam.; sap oxidizing yellow; buds erect; corolla white; all open flowers fallen by 8 a.m."; – same data except for: (fr), **9715** [NY], "tree 10 m × 10 cm; calyx coriaceous, brownish-green; fruits immature, globose, 1.5 cm diam.". – Rondônia, Porto Velho, parcela 13, margem direita, setor 02, "Zona 20L SAD69UTL", [ca. 8°51' S, 63°43' W], solo argilo-arenoso, (yfr), 9 Dec. 2009, **N.F.C. Reis & Nilson 2** [RB 2× n.s. (dig. photos), RON n.s.], "árvore 5 m; casca com aparência rugosa e estriada; exsudato do tipo seiva; indumento de pilosidade branca nos ramos e folhas; folhas de consistência membranácea; fruto seco indeiscente de coloração verde; sementes de cor verde e arilo verde"; – "Quagará-Mirim" or "Quajará-Mirim" [= Guajará-Mirim], N of town, [10°44' S, 65°20' W], on rather fertile soil, (fr), 3 Jun. 1943, **J.T. Baldwin Jr. 2951** [F, WIS (MAD)], "tree to 25 ft.; fruit mahogany-colored when ripe"; – Mun. de Porto Velho, próximo da Vila Campo Novo, área da Mineração Metalcom (antiga Mineração Mibrasa), morro atrás da casa de visitas, 10°35' S, 63°39' W, mata secundaria, solo areno-pedregoso, (fr), 22 Apr. 1987, **C.A. Cid Ferreira et al. 8875** [FHO, INPA, NY n.s., W], "arbusto 3 m; frutos com cálice verde, imaturos de cor verde"; – Rio Jamarí, Santa Cruz, [10°14' S, 63°13' W], capoeira alta, (fr), 29 Jun. 1965, **J.M. Pires & R.T. Martin 10002** [C, IAN, K, NY, SI, UB],

"planta de 2–3 m × 5 cm diam."; – "Alta Floresta do Oeste", (fr), Mar. 2004, **A. Oliveira 795** [RB n.s. (dig. photo)]. – Mato Grosso, Aripuanã, [10°15' S, 59°25' W], mata de terra firme; solo argiloso, (fr), 12 Jul. 1976, **M. Gomes & S. Miranda 16** [INPA], "árvore 10 × 12 cm diam."; – same area: (fr), 31 May 1976, **O.P. Monteiro et al. 1134** [INPA], "árvore 10 m × 15 cm diam.". – Pará, Basin of Rio Xingu, Gleba Bacaja, lote 88, just below mouth of Rio Bacaja, 3°22'20" S, 50°47'50" W, [correct is: 3°22' S, 51°47' W], forest on terra firme, (fl female), 22 Nov. 1980, **G.T. Prance et al. P26389** [GH, MICH, MO, NY], "tree 15 m; flowers and immature fruits green"; – same data except for: Genipapo trail, (fl male), 1 Dec. 1980, **P26565** [F, K, MG, MO, NY], "tree 15 m"; – margem direita da rodovia Tucurui, Repartimento km 41 à 45, [ca. 4°19' S, 49°47' W], capoeira de terra firme, (fr), 7 Apr. 1981, **N.A. Rosa et al. 4066** [MG, NY, TEX], "arbusto 3 m; frutos imaturos verdes"; – Marabá, Rio Tocantins, [5°21' S, 49°7' W], (fr), 20 Jun. 1949, **R.L. Fróes & G.A. Black 24634** [K], "arbusto; fruto verde"; – Estreito – Marabá Km 2 [not located], (fr), 9 Apr. 1974, **G.S. Pinheiro & J.F.V. Carvalho 654** [INPA n.s. (dig. photo), MG n.s.], "árvore 3 m". – Tocantins, ca. 15 km S of Araguaína, ca. 300 m, [7°20' S, 48°12' W], cut-over forest, (fr), 15 Mar. 1968, **H.S. Irwin et al. 21203** [NY n.s., UB, W], "tree ca. 3 m × 5 cm; fruit green". – Maranhão, Mun. Carolina, BR 010, Transamazônica, margem esquerda da rodovia, lugar Pedra Caida, [7°2' S, 47°25' W], topo da serra, vegetação cerradão, (fr), 13 Apr. 1983, **M.F.F. da Silva et al. 1089** [FHO 2×, IAN, INPA, MG n.s., NY, W], "árvore de 5,5 m, caída; fruto imaturo verde".

The following specimens are atypical and especially those from eastern Bolivia and Mato Grosso seem to represent intermediates with subsp. *obovata* (see the note above):

Bolivia, Santa Cruz, Prov. Angel Sandoval, Comunidad San Fernando, ribera del Río San Fernando, 108 m, 17°15'33,7" S, 58°38'13,7" W, bosque ribereño con dosel de 15–20 m de altura, (fr), 7 May 1997, **M. Saldias et al. 5199** [MO n.s., USZ n.s., W], "arbusto hasta 2,5 m; diámetro basal igual 4 cm; corteza gris clara, lisa; frutos globosos, verdes" [leaves glabrous, ± reticulate adaxially]; – Prov. German Busch, Área Natural de Manejo Integrado Otuquis, estancia Las Camelias, hacia el lado oeste de la estancia Las Camelias, 187 m, 19°31'15" S, 58°06'36" W, bosquecillo de palmares y alcornocales, (fl female), 2 Nov. 1998, **A. Carrion & E. Ramos 650** [MO n.s., W], "árbol de 10 m y 12 cm de DAP; flores verdes; frutos verdes".

Brazil, Mato Grosso, Mun. Vila Bela da Sma. Trindade, Córrego da Cascata ["Cascata dos Namorados" ?], [ca. 15°0' S, 60°1' W], pastos, (fr), 18 Aug. 1997, **G. Hatschbach et al. 66982** [GH n.s., MBM, U], "pequena arvore"; – Mun. Figueirópolis do Oeste, Rod. BR-248, 5 km E de Figueirópolis do Oeste, [15°27' S, 58°41' W], mata degradada, (fr), 8 May 1995, **G. Hatschbach et al. 62495** [US], "árvore 5 m"; – Bandeira inter Guia et Guyabá [= Cuiabá], [15°29' S, 56°12' W], in silvula secus rivum, (fr), 14 May 1894, **G.O.A. Malme 1630B** [S 3×], "arbor sat parva"; – Cuyabá [= Cuiabá], [15°35' S, 56°5' W], in silva ripa fluminis Cuyabá, (st), 13 Jul. 1902, **G.O.A. Malme s.n.** [S], "arbor parva cortice tenui laevigatas"; – Fazenda São Carlos, 16°44' S, 58°28' W, mata de cordilheira; solo arenoso, (fr), 22 Aug. 1980, **R.L. de Loureiro 32** [RB n.s. (dig. photo)], "árvore 5 m, frequência mediana; fuste 10–20 cm de diâmetro; frutos jovens de coloração verde; comum nos capões, cordilheiras; espécie dominada"; – Rodovia Transpantaneira Poconé-Porto Jofre, km 115, [ca. 17°1' S, 56°55' W], (fr), 21 Aug. 1989, **M. Silveira & F.C. de Silva s.n.** [MBM], "árvore 11.0 m, pouco frequente; fruto imaturo verde"; – Mun. Poconé, Pantanal, 16 km NW of Porto Jofre on Transpantaneira (MT060) to Poconé, 17°15' S, 56°55' W, marshland and adjacent open forest dominated by *Vochysia*, (fl male), 26 Oct. 1985, **W. Thomas et al. 4619** [FHO, INPA, MG n.s., NY n.s., SPF, W], "treelet 3 m; flowers silvery outside, brownish inside"; – Transpantaneira Highway, Fazenda Jofre, 17°10–17' S, 56°50' W, [correct is probably: 17°20' S, 56°48' W], forest island in campo, (fr), 13 Jun. 1979, **G.T. Prance et al. 26199** [CEN, GH, NY], "tree 10 m × 10 cm diam.; fruit and calyx green"; – Rodovia Transpantaneira (Poconé), Fazenda Santa Catarina, km 7 [not traced], região pantanosa; solo argilo-arenoso, (fr), 15 Jul. 1976, **M. Macedo et al. 68** [INPA], "arvoreta 3 m; frutos imaturos cor verde"; – without further data, (fr), Jul. 1892, **C.E.O. Kuntze s.n.** [NY]; – (fr), Jul. 1892, **C.E.O. Kuntze 16** [M].

Diospyros yatesiana Standl. ex Lundell

This species has already been treated in Wallnöfer (2009a).

Chromosome counts: R. Stockenhuber carried out counts using root tips taken from a plant growing in a pot on the window-sill in my office (voucher specimen: Wallnöfer

14910 [W]). The fresh fruits were collected in Guatemala near San José on the Lake Petén Itzá (12 Jan. 2004, R.O. Frisch s.n. [W spirit collection]). The plant was found to be diploid with 2n = 30 (TURNER et al. 2013).

The treelet is still growing in my office, and requires being watered only from below (the superficial earth has to be kept completely dry, otherwise the plant soon begins to sicken)! Probably due to the unnatural conditions where it lives, it did never lose all the leaves during winter time (although the species is deciduous). Very unfortunately, I was not informed when it germinated in the glasshouse of the Botanical Garden, therefore, no details can be given about the germination.

Diospyros texana SCHEELE

This species has already been treated in WALLNÖFER (2010a, 2011).

Chromosome counts: R. Stockenhuber carried out counts using root tips taken from a plant growing in the Botanical Garden of the University of Vienna (voucher specimen: B. Wallnöfer & S. Duangjai 13946 [W]). The fresh fruits were collected in Texas, Hays County, ca 24 miles southwest of Austin, 30°8'15" N, 98°1'52" W, 6 Aug. 2001, J. Richard Abbott 14515 [W]. The plant was found to be diploid with 2n = 30 (TURNER et al. 2013). The counts published by BALDWIN & CULP (1942) and ECKENWALDER (2009) are confirmed.

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