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Salzmann's Collections of *Stigmaphyllon* (Malpighiaceae) from Bahia, Brazil

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ABSTRACT. Salzmann's specimens of *Stigmaphyllon* (Malpighiaceae) from Bahia, Brazil, are reexamined, and the application of the names *S. rotundifolium* and *S. salzmannii*, based on two of these collections, is clarified. Three new species are recognized among Bahian collections commonly assigned these names and are here described: **S. bahiense**, **S. blanchetii**, and **S. cavernulosum**. *Stigmaphyllon irregulare* Adr. Juss., misconstrued by Niedenzu, is considered a synonym of *S. rotundifolium*.

Philip Salzmann (1781–1851), botanist, entomologist, physician, and educator, spent the years from 1827 to 1830 in the Brazilian port of Salvador, Bahia (Röse 1853). Among the yellow-flowered Malpighiaceae that he gathered during his excursions are specimens of *Stigmaphyllon*, a neotropical genus of ca. 100 species, of which ca. 15 occur in Bahia. Salzmann's collections include the distinctive *S. ciliatum* (Lam.) Adr. Juss. (*Salzmann 53*, W!; *97*, G!; *s.n.*, G!, K!, MO!, P!, W!) and an assemblage in which Adrien de Jussieu (1840) discerned *S. rotundifolium* Adr. Juss. and *S. salzmannii* Adr. Juss. Jacques Samuel Blanchet (1807–1875), a businessman and amateur naturalist living in Salvador from 1828 until 1856 (Urban 1895), with the help of assistants greatly increased the number of Bahian specimens available to European botanists. Few collections from this diverse and highly endemic flora were added to Salzmann's and Blanchet's gathering, until the results of the recent efforts by the collectors from CEPEC (Centro de Pesquisas do Cacau; see Mori and Mattos Silva 1979) and by R. M. Harley and his collaborators at Kew were distributed. The floras of Espírito Santo, south of Bahia, and those of the states to the north are still even less known than that of Bahia. Jussieu's names have been widely applied, often indiscriminately, to many specimens of *Stigmaphyllon* from Bahia and adjacent parts of eastern Brazil. Examination of the collections now accumulated reveals that they encompass three additional species, here described as new: *S. bahiense*, *S. blanchetii*, and *S. cavernulosum*.

DISCUSSION

Salzmann recognized four taxa within the group of specimens that include the types of *S. rotundifolium* and *S. salzmannii* and labeled them "Banisteria tomentosa," "Banisteria polymorpha glabra," "Banisteria polymorpha pilosa," and "Banisteria polymorpha triloba." The Linnaean genus *Banisteria* served as a catch-all for wing-fruited species whose samaras feature a large dorsal wing and much smaller, if any, lateral winglets until Jussieu (1832) redefined *Banisteria* (=*Banisteriopsis* Robinson in Small) and erected several new genera to accommodate the divergent elements. He segregated those species characterized by styles with apical folioles and internal stigmas into *Stigmaphyllon* (figs. 1d, j, 2e). In most species, the androecium is heteromorphic. The stamens are of unequal size, and the anthers of stamens opposite the lateral sepals commonly consist of enlarged connectives bearing 0–2 reduced locules (figs. 1e, k, 2f). Jussieu studied the Salzmann collections in the herbaria of de Lessert and de Candolle, now housed at G, and published *S. rotundifolium* and *S. salzmannii* in his synopsis of the Malpighiaceae (1840). In his monograph of the family (1843), he supplied more detailed descriptions as well as comments about the specimens he saw. He based *S. rotundifolium* on *Salzmann 98* ("Banisteria tomentosa") and *S. salzmannii* on *Salzmann 95* ("Banisteria polymorpha glabra").

The confusion attending the application of Jussieu's names was not resolved by Niedenzu's treatment of these two species in his monograph of *Stigmaphyllon* (1899, 1900) and his account of the Malpighiaceae for *Das Pflanzenreich* (1928). Although Niedenzu saw the holdings of several of the major European herbaria, including those at G, he never had the opportunity to study those housed at Paris. Niedenzu's unfamiliarity with Jussieu's types at P and P-JU and the paucity of good collections from Brazil

caused some regrettable misinterpretations, including his concepts of *S. rotundifolium* and *S. salzmannii* as well as his disposition of the remaining two elements of the four taxa recognized by Salzmann. Niedenzu expanded the circumscriptions of *S. rotundifolium* and *S. salzmannii* to include plants from southern and central Brazil and even one collection from Colombia, which are now recognized as belonging to other species. He cited Salzmann's "Banisteria polymorpha pilosa" under *S. affine* Adr. Juss. and "Banisteria polymorpha triloba" under *S. angustilobum* Adr. Juss., endemics of Rio de Janeiro.

Because it concerns the circumscription of *S. rotundifolium*, Niedenzu's interpretation of *S. irregulare* Adr. Juss. must also be corrected here. Jussieu based this name on Bahian flowering specimens supplied by Blanchet, in which the laminas vary from ovate to 2–3-lobed. Niedenzu believed that the fruiting collections *Lund 561* (C!), *Lund 569* (C!), and *Weddell 597* (F!, G!, P!) from Rio de Janeiro belonged to *S. irregulare* and added the characters of the samaras to his descriptions. Those specimens are actually assignable to *S. affine*. Their distinctive samaras are strikingly modified and not at all like those commonly found in the genus (e.g., fig. 2j). The greatly enlarged nut (ca. 1.5 cm in diam.) accommodates air chambers surrounding the locule. It is encircled by a vaguely triangular dorsal wing (ca. 3.7 cm high, measured from the base of the nut, and ca. 2.7 cm at its widest), and bears a number of lateral winglets and crests. A photo of the supposed "type" of *S. irregulare* (Field Museum neg. no. 24243; F!, GH!, MICH!) depicts this "irregulare-cum-affine" mixture. It shows a probable isotype of *S. irregulare* (at G) supplemented with a fruiting branch from *Weddell 597*, as noted on the scale-ticket. Although some species of *Stigmaphyllon* always have lobed or dissected laminas [*S. angulosum* (L.) Adr. Juss., *S. angustilobum*, *S. jatrophifolium* Adr. Juss., *S. laciniatum* (Ekm. ex Nied.) C. Anderson, *S. urenifolium* Adr. Juss., *S. vitifolium* Adr. Juss.], it is not unusual to encounter occasional individuals with 3–5-lobed laminas among species characterized by undivided leaves. The holotype of *S. irregulare* (P-JU!), as well as the three Blanchet specimens at G(!) that are apparently from the same gathering, two of them annotated by Jussieu, represent the same species as *S. rotundifolium*. The two taxa are here combined for the first time under the name *S. rotundifolium*.

Botanists, perhaps following Niedenzu, have applied the name *S. rotundifolium* to Bahian plants with broadly ovate or elliptical to suborbicular laminas. These prove to represent three species most easily separated by the vestiture of the lamina. In *S. rotundifolium*, Salzmann's "Banisteria tomentosa," the laminas are sparsely to moderately sericeous below (fig. 2i), whereas those of *S. bahiense* are appressed-tomentose (often densely so) below (fig. 1c). In *S. cavernulosum* the lamina is pubescent with T-shaped hairs in which the trabecula (the cross piece) is crisped or curly. In *S. rotundifolium* and *S. cavernulosum* the anthers are glabrous, and the locules of those opposite the sepals are reduced (fig. 1k). In *S. bahiense*, the anthers are usually glabrous but sometimes bear a few scattered hairs. Those opposite the anterior-lateral sepals also have reduced locules; those opposite the posterior-lateral sepals have only one reduced locule, are sterile (fig. 1e), or rarely bear two reduced locules. Although all three species have fimbriate posterior petals, only in *S. bahiense* and *S. cavernulosum* are the lateral petals fimbriate or denticulate as well. Those of *S. rotundifolium* are erose.

Stigmaphyllon cavernulosum differs from all other species of the genus by its samaras (fig. 1h). As in *S. affine*, the nut contains an array of air chambers surrounding the locule (fig. 1l), but the dorsal wing is erect and tapers from the base, somewhat like the dorsal wing of *S. puberum* (Rich.) Adr. Juss. Multiple air chambers are also found in the highly modified samaras of the Amazonian *S. adenodon* Adr. Juss. and *S. lacunosum* Adr. Juss., and probably aid in dispersal by water. In these two species and in *S. affine*, the dorsal wing is so reduced that wind dispersal is unlikely. *Stigmaphyllon cavernulosum* is also reported to grow along river banks.

The samaras of *S. rotundifolium* (fig. 2j) and *S. bahiense* (fig. 1f) are shaped like those of most species. Those of *S. rotundifolium* have relatively large lateral winglets that extend below the nut, an uncommon feature in *Stigmaphyllon* as is the presence of a pronounced tooth below the nut. The most mature samaras seen (none with mature seeds) also contain air pockets but in a less complex pattern than in *S. cavernulosum* and the other species cited. In *S. rotundifolium*, the locule abuts a narrow air chamber on each side (fig.

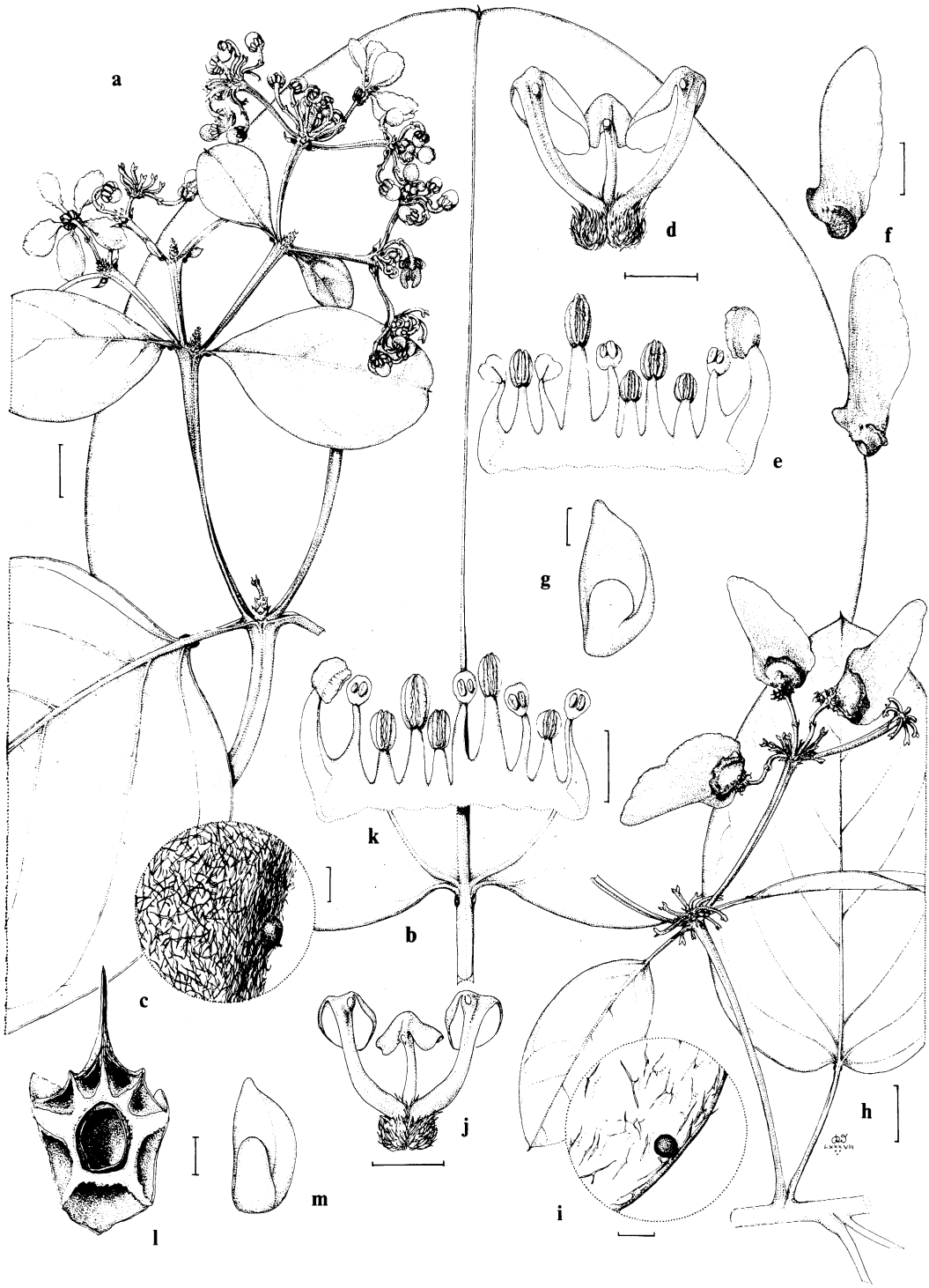

FIG. 1. *Stigmaphyllon bahiense* and *S. cavernulosum*. a–g. *S. bahiense*. a. Habit. b. Large leaf. c. Detail showing vestiture and marginal gland of lower surface of lamina. d. Gynoecium; anterior style in center. e. Androecium; stamen second from left is opposite the posterior petal. f. Two samaras. g. Embryo. h–m. *S. cavernulosum*. h. Habit. i. Detail showing vestiture and marginal gland of lower surface of lamina.

2k); none of the walls are thickened. The samaras of *S. bahiense* lack air pockets.

While *S. rotundifolium* served as a convenient repository for plants with broad laminas and glabrous anthers from coastal northern Brazil, *S. salzmannii* was the bin for the residue that did not fit any of the distinctive and thus better understood species of *Stigmaphyllon* from that region. This "salzmannii" group includes specimens with glabrous as well as pubescent laminas, which correspond respectively to Salzmann's "Banisteria polymorpha glabra" (i.e., *S. salzmannii*) and "Banisteria polymorpha pilosa." In his monograph of the family (1843), Jussieu noted the similarity of the plants labeled "Banisteria polymorpha pilosa" and "Banisteria polymorpha triloba" to those named "Banisteria polymorpha glabra" but excluded them from *S. salzmannii*. They are here assigned to *S. blanchetii*. Although this species does share several characters with *S. salzmannii*, including pubescent anthers and stalked marginal leaf glands, it is readily distinguished by the vestiture of the laminas. In *S. salzmannii*, the mature laminas are glabrous or at most glabrate. Even young leaves and the reduced ones of the inflorescence are only sparsely beset with T-shaped hairs below (fig. 2m); the trabecula is always straight. The lower surfaces of laminas of *S. blanchetii* are densely covered with T-shaped hairs whose trabeculae are wavy or crisped (fig. 2d). The samaras of these two species are of the common type (fig. 2g, n), without air pockets. The specimens Salzmann called "Banisteria polymorpha triloba" are examples of the occasional lobed-leaf forms mentioned above. *Harley 15017* is a second collection of this variant in *S. blanchetii*. The range of this species extends from Pernambuco to Espírito Santo. *Stigmaphyllon salzmannii*, collected once in Espírito Santo, is otherwise known only from Bahia.

TAXONOMY

Stigmaphyllon bahiense C. Anderson, sp. nov. (fig. 1a–g).—TYPE: Brazil, Bahia, Bom Gosto e Olivença [near Ilhéus], 15 Mar 1943, *Frões 20021* (holotype: IAN!; isotypes: F!, MICH!, NY!).

Liana. Laminae 8.8–27 cm longae, 5.8–22.5 cm latae, late ovatae vel (late) ellipticae vel interdum suborbiculares, supra glabrae, subtus adpresso-tomentosae, margine sparse glandulosa. Inflorescentia dichasialis vel thyrsiformis constata ex umbellis, floribus in quaque umbella (10)15–20. Pedunculi 5.5–15 mm longi; pedicelli 4–10.5 mm longi. Petala lateralia limbo orbiculari, margine fimbriata vel denticulata; petalum posticum limbo orbiculari, margine fimbriata. Stamina heteromorpha; antherae sepalis postico-lateralibus oppositae 1–2 loculis redactis instructae vel steriles, antherae ceterae fertiles; antherae glabrae vel raro sparse pubescentes. Stylus anticus 2.7–3.6 mm longus, apice 1.4–2.3 mm longo, utroque foliolo 1.2–1.6 mm longo, 1.2–2 mm lato, subquadrato vel suborbiculari vel subrectangulari; styli postici 3.7–4.3 mm longi, lyrati, foliolo 2.2–2.5 mm longo latoque, quadrato vel suborbiculari.

Vine to 10 m. Laminas 8.8–27 cm long, 5.8–22.5 cm wide, broadly ovate to elliptical to broadly elliptical to suborbicular; apex emarginate-mucronate to obtuse-mucronate to sometimes acuminate-mucronate; base attenuate to truncate to cordate; adaxial surface glabrous or sometimes with appressed hairs on the major veins near the base, the abaxial surface appressed-tomentose (the trabecula wavy to curled), with irregularly spaced sessile glands (each 0.3–0.5 mm in diam.) borne adjacent to the margin below, with a pair of prominent but sessile glands at the apex of the petiole, each gland 1.3–3.2 mm in diam.; petioles 1.8–9 cm long, densely sericeous; stipules triangular, eglandular. Flowers (10)15–20 per umbel, these borne in dichasia, compound dichasia, or small thyrses. Peduncles 5.5–15 mm long; pedicels 4–10.5 mm long, terete; peduncles 0.8–2 times as long as the pedicels. Bracts 1.2–2.5 mm long, 1–1.8 mm wide, triangular or narrowly so; bracteoles 1.3–2.2 mm long, 0.8–1.5 mm wide, oblong to ovate, each with a pair of inconspicuous abaxial glands (each 0.2–0.3 mm in diam.). Se-

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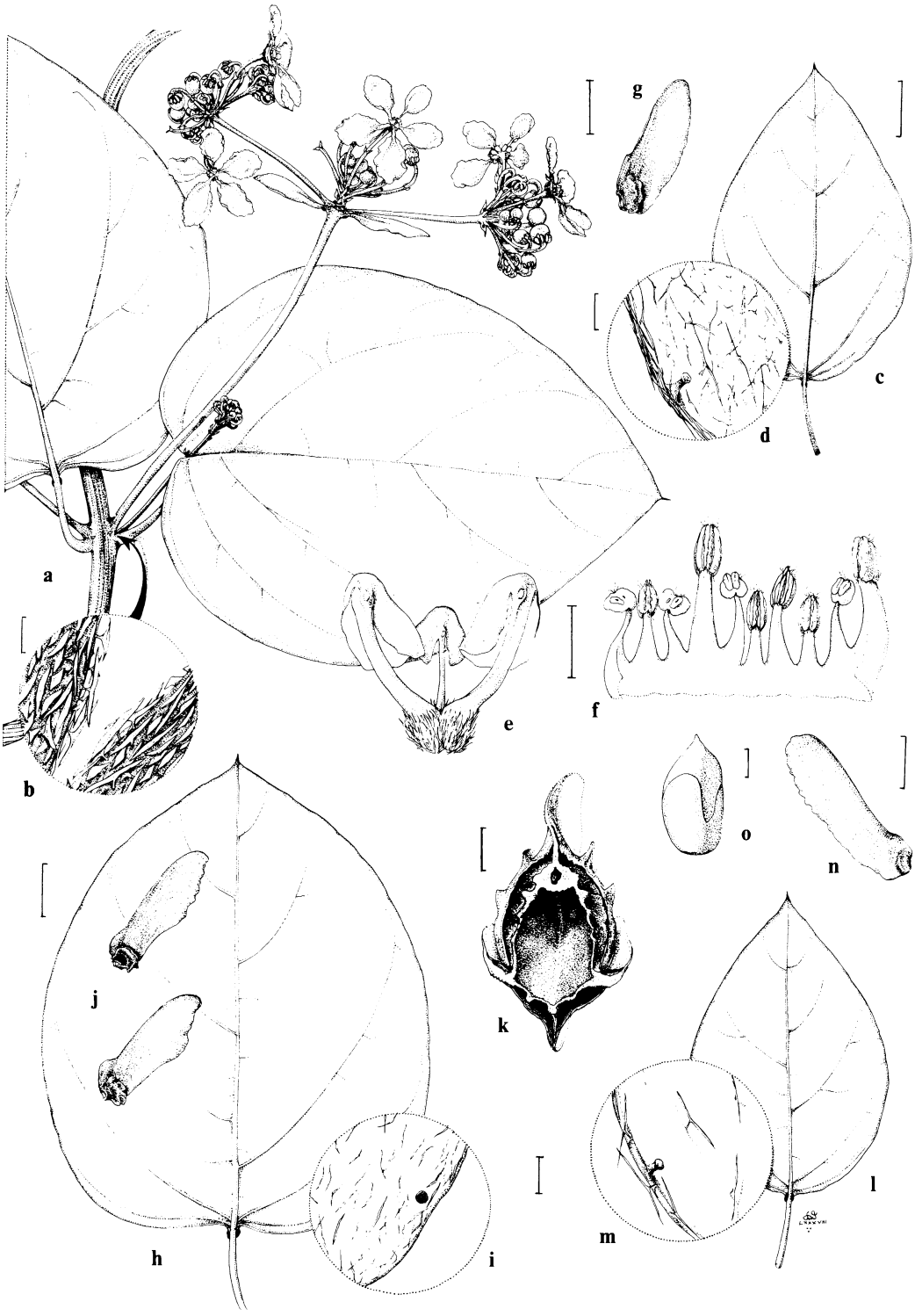
j. Gynoecium; anterior style in center. k. Androecium; stamen second from right is opposite the posterior petal. l. Longitudinal section through samara; note air chambers surrounding the locule. m. Embryo. Scale for a, b, f, h, bar = 1.5 cm; for c, i, bar = 0.5 mm; for d, e, g, j–m, bar = 2 mm. (Based on: a–c, *Frões 20021*; d, e, *Pinheiro 59*; f, *Heringer et al. 3278* (above), *Mori & Kallunki 9898* (below); g, *Heringer et al. 3278*; h–m, *Belém & Magalhães 598*.)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pals 2.3–2.5 mm long, 2–2.4 mm wide, with glands (2)2.3–3 mm long, 1–1.4 mm wide. All petals with the limbs orbicular, glabrous, those of the lateral petals with the margin fimbriate or denticulate, that of the posterior petal with the margin fimbriate, the fimbriae and teeth ca. 0.4 mm long; limb of the anterior-lateral petals 13–14 mm long and wide, the limb of the posterior-lateral petals ca. 11 mm long and wide, the limb of the posterior petal 9–10 mm long and wide. Stamens unequal, those opposite the posterior-lateral petals (and the posterior styles) the largest, the anthers of those opposite the anterior-lateral sepals with the connective enlarged and the locules reduced, the anthers of those opposite the posterior-lateral sepals usually with only 1 reduced locule or sterile or rarely with 2 reduced locules; anthers glabrous or rarely sparsely pubescent. Anterior style 2.7–3.6 mm long, shorter than the posterior two, glabrous; apex 1.4–2.3 mm long, each foliole 1.2–1.6 mm long, 1.2–2 mm wide, subsquare to suborbicular to subrectangular. Posterior styles 3.7–4.3 mm long, lyrate, with scattered hairs in the proximal ⅓; foliole 2.2–2.5 mm long and wide, subsquare or suborbicular. Dorsal wing of samara 4.3–5 cm long, 1.5–1.8 cm wide, upper margin with a blunt tooth; nut bearing 1 lunate to rectangular lateral winglet on each side, these 8–10 mm long, 2–3.5 mm wide, sometimes interrupted, sometimes also with 1 or 2 additional winglets or spurs (ca. 1 mm long and wide); nut 8.5–9 mm high, 4.5–5 mm in diam.; air chambers absent; areole 4.5–5 mm long and wide, concave; carpophore ca. 2 mm long. Seed ca. 9.7 mm long; embryo ovoid, ca. 2 times as long as wide, the outer cotyledon ca. 13.5 mm long, ca. 4.7 mm wide, the distal ⅓ folded over the inner cotyledon, the inner cotyledon ca. 5.5 mm long, ca. 3.4 mm wide, straight.

Phenology. Collected in flower in February, March, May, June, and December, in fruit in January, April, May, and December.

Distribution. In coastal wet forest; Bahia, Brazil; sea level to 100 m.

Additional specimens examined. BRAZIL. **Bahia:** Mpio. Ilhéus, ramal no 7 km da estrada Ilhéus/Olivença, *Carvalho & Plowman 1618* (F, MICH); ca. 5 km SW of Itacaré, on side rd from main Itacaré-Ubaitaba rd, S of mouth of Rio de Contas, ca. 14°20′S, 39°3′W, *Harley 17486* (K, MICH, NY, U); Itacaré, near mouth of Rio de Contas, ca. 14°18′S, 38°59′W, *Harley 17573* (K, MICH); ca. 5 km N from turning to Maraú along the Campinho rd, 14°4′S, 38°58′W, *Harley 22167* (MICH); estr. Itabuna-Una, *Heringer et al. 3278* (MICH); Mpio. Una, Colonia de Una, *Magalhães 305* (CEPEC); Mpio. Una, estrada Una-Canavieiras, Km 25, *Martinelli et al. 8892* (CEPEC); Mpio. Uruçuca, nova estrada que liga Uruçuca a Serra Grande, a 45 km de Uruçuca, *Mori & Kallunki 9898* (CEPEC, MICH); Mpio. Itacaré, a 1–3 km ao S de Itacaré, *Mori et al. 13076* (CEPEC, MICH), *Mori & dos Santos 10145* (CEPEC, MICH); Rio Branco, plantação de cacau, *Pinheiro 59* (CEPEC, UB); prope Domingo, *Riedel 754* (LE, S); Mpio. Ilhéus, Sta. Rita, *Velloso 719, 732* (R); Ilhéus, *Wawra & Maly 373* (W).

Stigmaphyllon blanchetii C. Anderson, sp. nov. (fig. 2a–g).—TYPE: Brazil, Bahia, Fonte dos Protomartires do Brasil, Porto Seguro, 0–10 m, ca. 16°26′S, 39°5′W, *Harley 17244* (holotype: RB!; isotypes: K!, MICH!, MO!, NY!, P!, U!).

Liana. Laminae 5.2–14.5 cm longae, 3.2–11 cm latae, (anguste) ellipticae vel (anguste) lanceolate vel (anguste) ovatae vel interdum suborbiculares vel interdum 3–5-lobatae, supra glabrae vel interdum glabratae, subtus pilos T-formes ferentes, trabecula undulata vel crispata, margine sparse glandulosa. Inflorescentia

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FIG. 2. *Stigmaphyllon blanchetii, S. rotundifolium,* and *S. salzmannii.* a–g. *S. blanchetii.* a. Habit. b. Detail showing vestiture of stem and petiole. c. Leaf. d. Detail showing vestiture and marginal gland of lower surface of lamina. e. Gynoecium; anterior style in center. f. Androecium; stamen second from left is opposite posterior petal. g. Young samara. h–k. *S. rotundifolium.* h. Leaf. i. Detail showing vestiture and marginal gland of lower surface of lamina. j. Two samaras. k. Longitudinal section of samara; note the two air chambers flanking the locule. l–o. *S. salzmannii.* l. Leaf. m. Detail showing vestiture and marginal gland of lower surface of lamina. n. Samara. o. Embryo. Scale for a, c, b, h, j, l, n, bar = 1.5 cm; for b, bar = 0.2 mm; for d, i, m, bar = 0.5 mm; for e, f, k, o, bar = 2 mm. (Based on: a–d, *Harley 18212*; e, f, *Harley 17244*; g, *Campêlo et al. 1569*; h–k, *Blanchet 381*; l, m, *N. T. Silva 58340*; n, o, *Blanchet s.n.*)

dichasialis constata ex umbellis vel corymbis, floribus in quaque umbella vel corymbo (10)15–25. Pedunculi (2.5)4.5–12(15) mm longi; pedicelli (2.5)4–11 mm longi. Petala lateralia limbo orbiculari vel suborbiculari, petalum posticum limbo late obovato vel orbiculari, marginibus fimbriatis, fimbriato-denticulatis, denticulatis, eroso-denticulatis vel interdum erosis. Stamina heteromorpha, antherae sepalis antico-lateralibus oppositae 1–2 loculis reductis instructae vel raro steriles, antherae sepalis postico-lateralibus steriles vel raro 1 loculo reducto instructae; antherae pubescentes. Stylus anticus 2.8–3.6 mm longus, apice 1.4–2.2 mm longo, utroque foliolo 1.2–2.3 mm longo, 1.3–2.2 mm lato, subquadrato vel suborbiculari; styli postici 3.5–4.8 mm longi, lyrati, foliolo 2–3.4 mm longo, 1.8–2.7 mm lato, subquadrato vel suborbiculari vel subrectangulari.

Vine to 8 m. Laminas 5.2–14.5 cm long, 3.2–11 cm wide, narrowly elliptical to elliptical to narrowly lanceolate to lanceolate to narrowly ovate to ovate or sometimes suborbicular or sometimes 3–5-lobed; apex mucronate or emarginate-mucronate or sometimes acuminate to rarely caudate; base usually truncate to cordate but sometimes attenuate or auriculate; adaxial surface sometimes glabrate but usually glabrous, the abaxial surface densely pubescent with T-shaped hairs (the trabecula wavy or crisped), with scattered stalked glands (each 0.1–0.2 mm in diam., 0.1–0.4 mm long) borne adjacent to the margin below, with a pair of prominent but sessile glands at the apex of the petiole or sometimes halfway on the lamina, each gland 1–2.5 mm in diam.; petioles 1–4.7 cm long, bearing stout T-shaped hairs; stipules triangular or narrowly so, eglandular. Flowers (10)15–25 per umbel or corymb, these borne in dichasia or compound dichasia. Peduncles (2.5)4.5–12(15) mm long; pedicels (2.5)4–11 mm long; peduncles 0.5–2 times as long as the pedicels. Bracts 0.8–2.1(3) mm long, 0.7–1.3(1.6) mm wide, triangular or narrowly so; bracteoles 0.8–1.4(1.9) mm long, 0.8–1.2 mm wide, triangular to ovate, eglandular or each with 1 or 2 inconspicuous abaxial glands (each 0.2–0.4 mm in diam.). Sepals 2–2.5 mm long, 1.8–2.6 mm wide, with glands (1.2)1.5–2.3 mm long, 0.8–1.1 mm wide. All petals with the limbs glabrous, those of the lateral petals orbicular, that of the posterior petal orbicular to broadly obovate, all with the margin fimbriate, fimbriate-denticulate, denticulate, erose-denticulate, or sometimes erose, the teeth and fimbriae ca. 0.4 mm long; limb of the anterior-lateral petals 11–15 mm long and wide, the limb of the posterior-lateral petals 10–14 mm long and wide, the limb of the posterior petal 10–13 mm long, 8.5–13 mm wide. Stamens unequal, those opposite the posterior-lateral petals (and the posterior styles) the largest, the anthers of those opposite the anterior-lateral sepals with the connective enlarged and the locules reduced or commonly with only one reduced locule or rarely sterile, the anthers of those opposite the posterior-lateral sepals usually sterile or sometimes with 1 reduced locule; anthers pubescent. Anterior style 2.8–3.6 mm long, shorter than the posterior two, glabrous or with some scattered hairs in the proximal ½; apex 1.4–2.2 mm long, each foliole 1.2–2.3 mm long, 1.3–2.2 mm wide, subsquare to suborbicular. Posterior styles 3.5–4.8 mm long, lyrate, glabrous or with scattered hairs in the proximal ½; foliole 2–3.4 mm long, 1.8–2.7 mm wide, subsquare to suborbicular to subrectangular. Mature fruit not seen; dorsal wing of immature samara 3.8 cm long, 1.3 cm wide, the upper margin with a blunt tooth; nut bearing 1 lunate lateral winglet on each side or also with an additional spur or winglet.

Phenology. Collected in flower throughout the year, in young fruit in August and September.

Distribution. In wet forest, at forest edge, riverside marsh, roadsides, near cultivated and otherwise disturbed areas; reported from sandy soils; in eastern Brazil from Paraiba south to Espírito Santo; sea level to 400 m.

Representative specimens examined (all specimens seen from Alagoas, Espírito Santo, Paraiba, and Pernambuco are listed). BRAZIL. **Alagoas:** Maceió, *Campêlo et al. 1569* (MICH, RB); 15 km E de Boca de Mata, 9°40'S, 36°6'W, *Kirkbride 4614* (UB); Maceió, Faz. Santa Luzia, próximo a Riacho Doce, *de Lyra et al. 17* (MO), *Netto R19563* (R.) **Bahia:** Ilhéus, Centro de Pesquisas de Cacau, CEPEC, CEPLAC, *Belém & Magalhães 577* (CEPEC, IAN, NY, UB); *Blanchet s.n.* (G); Mpio. Santa Cruz de Cabrália, Estãçao Ecológica do Pau-brasil, cerca 16 km a W de Porto Seguro, *Brito & da Vinha 222* (CEPEC); estrada de Bom Gosto a Pontal, Ilhéus, *Fróes 20018* (F, IAN, MICH, NY); [Mpio. Belmonte] Barrôlandia-Estação Experimental Gregório Bondar, *Hage 154* (CEPEC, MICH); BA-360 hwy just E of Itambé, N of the Rio Pardo, 15°15'S, 40°36'W, *Harley 15017* (K, MICH, NY, P, U); 20 km from Una and 10 km from Nova Colonial, W along rd to Rio Branco, 15°15'S, 39°13'W, *Harley 18212* (CEPEC, MICH); Mpio. Nova

Viçosa, Dois Irmãos, *Hatschbach 47754* (MICH); Mpio. Caravelas, Corrego Taquaral, *Hatschbach 49484* (MICH); estr. Itabuna a Una, *Heringer 3267* (MICH, MO); Mpio. Porto Seguro, 16°32'S, 39°8'W, *Lima 37* (CEPEC, MG); Mpio. Una, rod. BA-265, a 19–22 km de Una, *Mori et al. 9273* (CEPEC, MICH); Mpio. Ilhéus, estrada entre Sururú e Vila Brasil, a 6–14 km de Sururú, a 12–20 km ao SE de Buerarema, *Mori & Benton 12872* (CEPEC, MICH); *Salzmann 94* (G), *96* (G), *s.n.* (G, K, LE, MO, P, R). **Espírito Santo:** Mpio. Jacaré, Agua Limpa, *Hatschbach 46976* (MICH); Mpio. Jacaré, rod. BR-101, *Hatschbach 51213* (MICH); Reserva Florestal de Linhares, CVRD, próximo Estrada 221 Talhão 203, *Lino 68* (RB, SP); entre Morro d'Anta e Santana, a 10 km de Santana [near Vitória], *Mattos 10758* (SP); Derrubada dos Paulistas corrego Dourado, *Mattos Filho & Magnanini 31* (RB); Reserva Florestal de Linhares, CVRD, próximo Estrada 142 Talhão 403, *Spada 142* (RB, SP). **Paraiba:** Remígio, *Barbosa 151* (RB); Areia, Eugenho Bom-Fim, *Fevereiro 282* (RB). **Pernambuco:** Recife, *Falcão et al. 776* (RB, SP); Goiânia, *Falcão et al. 1145* (SP); Sítio Água Comprida, *Guades 45* (US); *Pickel 254, 986* (both SP), *Pickel 2436* (NY—fragment).

Stigmaphyllon cavernulosum C. Anderson, sp. nov. (fig. 1h–m).—TYPE: Brazil, Bahia, Ilhéus, Centro de Pesquisas do Cacau, CEPEC, CEPLAC, *Belém & Magalhães 598* (holotype: UB!; isotypes: CEPEC!, NY!).

Liana. Laminae 8.2–13.5 cm longae, 5–9.4 cm latae, anguste vel late ellipticae, supra glabrae, subtus pilos T-formes ferentes, trabecula undulata vel crispata, margine glandulosa. Inflorescentia racemiformis constata ex umbellis, floribus in quaque umbella 15–25. Pedunculi 4.5–12.5 mm longi; pedicelli 4.5–9 mm longi. Petala orbicularia, marginibus fimbriatis. Stamina heteromorpha, omnia fertilia; antherae glabrae. Stylus anticus 2.7–3.5 mm longus, apice 1.7–1.8 mm longo, utroque foliolo 1.1–1.5 mm longo, 1–1.4 mm lato, triangulari vel subquadrato; styli postici 3.5–4.2 mm longi, lyrati, foliolo 1.7–2.5 mm longo, 1.8–2 mm lato, subquadrato vel subrectangulari. Loculus samarae ca. 7 cavernulis aëriis circumcinctus.

Vine. Laminas 8.2–13.5 cm long, 5–9.4 cm wide, narrowly to broadly elliptical; apex mucronate; base truncate to slightly cordate; adaxial surface glabrous, the abaxial surface pubescent with T-shaped hairs (the trabecula wavy or crisped), with irregularly spaced sessile glands (each 0.1–0.2 mm in diam.) borne adjacent to the margin below, with a pair of prominent but sessile glands at the apex of the petiole or halfway on the lamina, each gland 1.2–2 mm in diam.; petioles 2.5–6.3 cm long, sericeous to glabrate; stipules triangular or narrowly so, eglandular. Flowers 15–25 per umbel, these borne in dichasia, the dichasia borne on axes arranged in racemiform fashion on a primary inflorescence axis. Peduncles 4.5–12.5 mm long; pedicels 4.5–9 mm long, terete; peduncles 0.8–1.6 times as long as the pedicels. Bracts 1.6–2.3 mm long, 0.5–1 mm wide, narrowly triangular; bracteoles 1.1–1.6 mm long, 0.8–1 mm wide, oblong, each with a pair of inconspicuous abaxial glands (each up to 0.4 mm in diam.). Sepals 2.3–2.5 mm long, 2–2.3 mm wide, with glands 2.1–2.3 mm long, ca. 1.2 mm wide. All petals with the limbs orbicular, the margins with fimbriae ca. 0.3 mm long; limb of the anterior-lateral petals ca. 13 mm long and wide, the limb of the posterior-lateral petals ca. 11 mm long and wide, the limb of the posterior petal ca. 9 mm long and wide. Stamens unequal, those opposite the posterior-lateral petals (and the posterior styles) the largest, the anthers of those opposite the lateral sepals with the connective enlarged and the locules reduced; anthers glabrous. Anterior style 2.7–3.5 mm long, shorter than the posterior two, glabrous; apex 1.7–1.8 mm long, each foliole 1.1–1.5 mm long, 1–1.4 mm wide, triangular to subsquare. Posterior styles 3.5–4.2 mm long, lyrate, glabrous; foliole 1.7–2.5 mm long, 1.8–2 mm wide, subsquare to subrectangular. Dorsal wing of samara encircling the nut, 3.7–4.2 cm high measured from base of nut, 1.7–2 cm wide; nut with 1 lunate lateral winglet on each side, these 11–13 mm long, 1.5–3 mm wide, and with a vertical row of 3–5 crests and spurs next to the winglets; nut 11.5–12.5 mm high, 5.5–6 mm in diam., inflated, the locule surrounded by ca. 7 air chambers; areole ca. 4 mm long and wide, deeply concave; carpophore ca. 2.5 mm long. Seed ca. 8.7 mm long; embryo ovoid, ca. 2 times as long as wide, the outer cotyledon ca. 11.5 mm long, ca. 3.8 mm wide, the distal ⅓ folded over the inner cotyledon, the inner cotyledon ca. 6.7 mm long, ca. 2.5 mm wide, straight.

Phenology. Collected in flower and fruit in March and September.

Distribution. Along rivers; eastern Bahia; 40–120 m.

Additional specimens examined. BRAZIL. **Bahia:** *Blanchet 2203* (F, G); Ilhéus, *Blanchet 3027* (F, G, LE); Iguaçu, Cachoeira/Bahia, vale dos rios Paraguaçu e Jacuipe, ca. 12°32'S, 39°05'W, *Cavalo 717* (CEPEC); Mpio.

Ilhéus, Rio do Braço, *Velloso 717* (R); Mpio. Ilhéus, Faz. Pirataquisse, *Velloso 923* (R).

Stigmaphyllon cavernulosum is named for the distinctive chambered samaras, which separate it from other members of *Stigmaphyllon*. The arrangement of the inflorescence is also unusual in that the dichasia of umbels are borne on axes inserted alternately, rather than oppositely, on the primary inflorescence axis; however, such a shift is not unusual in the terminal parts of vines characterized by opposite leaves. Although this condition is present in all of the few collections studied, it is perhaps not characteristic of the species.

STIGMAPHYLLON ROTUNDIFOLIUM Adr. Juss., Ann. Sci. Nat. Bot. Sér. 2, 13:289. 1840. *Stigmaphyllon rotundifolium* f. II. *suborbiculare* Nied., Pflanzenreich IV. 141(2):491. 1928, nom. superfl. (fig. 2h–k).—TYPE: Brazil, Bahia, *Salzmann 98* (holotype: G!, photo: F!, GH!, MICH!, P-JU—fragment!, photo: MICH!).

Stigmaphyllon irregulare Adr. Juss., Ann. Sci. Nat. Bot. Sér. 2, 13:288. 1840.—TYPE: Brazil, Bahia, *Blanchet s.n.* (holotype: P-JU!, photo: MICH!; isotypes?: G—3 sheets!).

Stigmaphyllon rotundifolium f. I. *ovatum* Nied., Pflanzenreich IV. 141(2):491. 1928.—TYPE: Brazil, Bahia, *Blanchet 130* (lectotype here designated: G!).

Vine. Stems and branches sericeous when young, soon becoming glabrate. Laminas 7.8–14 cm long, 5.8–10 cm wide, ovate to elliptical to suborbicular; apex mucronate; base truncate to slightly cordate; adaxial surface glabrous, the abaxial surface sparsely sericeous to sericeous, with sessile glands (each 0.1–0.3 mm in diam.) borne adjacent to the margin below, with a pair of prominent but sessile glands at the apex of the petiole or halfway on the lamina, each gland 1.6–2.1 mm in diam.; petioles 3–6 cm long, sericeous to densely sericeous; stipules triangular, eglandular. Flowers 10–20 per umbel, these borne in dichasia or irregular compound arrangements, the 2nd order axes sometimes suppressed and then the lateral umbels sessile. Peduncles 5–9.5 mm long; pedicels 4–12 mm long, terete; peduncles 0.5–1.7 times as long as the pedicels. Bracts 1–1.5 mm long, 0.6–1.3 mm wide; bracteoles 0.8–1.2 mm long, 0.6–1 mm wide, each with 2 inconspicuous abaxial glands. Sepals ca. 2 mm long, 2.2–2.5 mm wide, with glands 1.8–2 mm long, ca. 1 mm wide. All petals with the limbs orbicular, glabrous, those of the lateral petals with the margin erose, that of the posterior petal with the margin fimbriate, fimbriae ca. 0.3 mm long; limb of the anterior-lateral petals ca. 11 mm long and wide, the limb of the posterior-lateral petals ca. 8 mm long and wide, the limb of the posterior petal ca. 7 mm long and wide. Stamens unequal, those opposite the posterior-lateral petals (and the posterior styles) the largest, the anthers of those opposite the lateral sepals with the connective enlarged and the locules reduced; anthers glabrous. Anterior style 3–3.3 mm long, shorter than the posterior two, glabrous; apex ca. 1.7 mm long, each foliole 1.4–1.5 mm long, 1–1.2 mm wide, broadly parabolic to subsquare. Posterior styles 3.6–4 mm long, lyrate, glabrous; foliole ca. 2 mm long and wide, subsquare. Dorsal wing of samara 3.7–3.9 cm long, 1.2–1.3 cm wide, upper margin with a blunt tooth; nut bearing 1 rectangular to lunate lateral winglet on each side, these 4.5–8.5 mm long, ca. 3 mm wide, extending below the nut, and sometimes also with 1–2 spurs; nut ca. 6.5 mm high, ca. 3.5 mm in diam., the locule flanked by 2 narrow air chambers; areole ca. 2.5–3 mm long and wide, concave; carpophore ca. 1.5 mm long. Mature seed not seen.

Phenology. Unknown.

Distribution. Bahia, Brazil; habitat unknown.

Additional specimens examined. BRAZIL. **Bahia:** *Blanchet 381, 698* (G), *Bondar 1710 p.p.* (F), *Salzmann s.n.* (G, K, LE, P, R, W).

STIGMAPHYLLON SALZMANNII Adr. Juss., Ann. Sci. Nat. Bot. Sér. 2, 13:288. 1840 (fig. 2l–o).—TYPE: Brazil, Bahia, *Salzmann 95* (holotype: G!, photo: MICH!, P-JU—fragment!, photo of fragment: MICH!).

Vine. Laminas 6–11.5 cm long, 3–6.4 cm wide, elliptical to lanceolate to ovate; apex mucronate or acuminate; base truncate or attenuate; adaxial surface glabrate to glabrous, the abaxial surface very sparsely pubescent with T-shaped hairs (the trabecula straight) to glabrous, with irregularly spaced stalked glands (each 0.2–0.3 mm in diam., 0.1–0.7 mm long) borne adjacent to the margin below, with a pair of prominent but sessile glands at the apex of the petiole, each gland 12–19 mm in diam.; petioles 1.5–2(3.2) cm long, bearing stout T-shaped hairs; stipules tri-

angular, eglandular. Flowers 15–25 per umbel or pseudoraceme, these borne in dichasia or on long axes in irregular compound arrangements. Peduncles 4.5–7 mm long; pedicels 5–7 mm long, terete; peduncles 0.8–1.6 times as long as the pedicels. Bracts 1–1.7 mm long, 0.7–1 mm wide; bracteoles 1–1.5 mm long, 0.9–1 mm wide, each with 2 inconspicuous abaxial glands (each up to 0.3 mm in diam.). Sepals 2.3–2.5 mm long and wide, with glands 1.5–2 mm long, 0.8–1 mm wide. All petals with the limbs orbicular, glabrous, the margin of lateral petals denticulate-fimbriate, of the posterior petal fimbriate, the teeth and fimbriae ca. 0.4 mm long; limb of the anterior-lateral petals (12)14–16 mm long and wide, the limb of the posterior-lateral petals (10)11.5–14 mm long and wide, the limb of the posterior petal 10.5–12 mm long and wide. Stamens unequal, those opposite the posterior-lateral petals (and the posterior styles) the largest, the anthers of those opposite the anterior-lateral sepals with the connective enlarged and the locules reduced and unequal or with only 1 locule, those opposite the posterior-lateral sepals sterile; anthers pubescent. Anterior style 3–3.6 mm long, shorter than the posterior two, glabrous or with a few scattered hairs proximally; apex (1.5)2 mm long, each foliole (1.8) 1.9–2.1 mm long and wide, subsquare. Posterior styles 3.8–4.3 mm long, lyrate, glabrous; foliole 2.5–3 mm long, (2)2.7–3 mm wide, subsquare to subrectangular. Dorsal wing of samara ca. 4.5 cm long, 1.2–1.4 cm wide, the upper margin with a blunt tooth; nut bearing 1 lunate to rectangular lateral winglet on each side, these 3.5–6.5 mm long, 0.5–2 mm wide, or sometimes only with a lateral tooth (ca. 1.2 mm long and 1.8 mm wide); nut 7.8–9 mm high, 5.5–5.7 mm in diam.; air chambers absent; areole ca. 5 mm long and wide, deeply concave; carpophore ca. 2.6 mm long. Seed ca. 8.6 mm long; embryo ovoid, ca. 2 times as long as wide, the outer cotyledon ca. 14 mm long, ca. 4.5 mm wide, the distal ½ folded over the inner cotyledon, the inner cotyledon ca. 5.4 mm long, ca. 3.5 mm wide, straight.

Phenology. Collected in flower from October through January and in July, in fruit in October and November.

Distribution. At forest edge, along roadsides, and in disturbed areas; Bahia and Espírito Santo, Brazil; sea level to 500 m.

Additional specimens examined. BRAZIL. **Bahia:** Mpio. Ilhéus, 16 km de Itabuna, *Belém & Mendes 174* (CEPEC, NY, UB), *Bierens de Haan 112* (U); Ilhéus, *Blanchet s.n.* (G); forests of the Gongoji basin, *Curran 151* (US); Mpio. Buerarema, S. José, *Magalhães 55* (CEPEC), *Martius 1163* (G, M, NY), *Salzmann s.n.* (K, LE, P); Itabuna, rd Itabuna-Buerarema, Km 25, *N. T. Silva 58340* (MICH, NY, UB), *Wawra & Maly 570* (W). **Espírito Santo:** Mpio. Aracruz, Estação de Biologia Marinha Mello Leitão, *Araujo 250 & Peixoto 120* (MICH, SP).

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