Contr. Univ. Michigan Herb. 19: 415–429. 1993.

NOVELTIES IN STIGMAPHYLLON (MALPIGHIACEAE) FROM SOUTH AMERICA

Christiane Anderson
University of Michigan Herbarium
North University Building
Ann Arbor, MI 48109-1057

The large, neotropical genus *Stigmaphyllon* (Malpighiaceae) comprises yellow-flowered vines that typically have long-petiolate elliptical to cordate leaves. The flowers are distinctive in that the lateral sepals each bear a pair of large elongate glands, the androecium is usually heteromorphic, and the three styles usually bear apical appendages, the folioles, for which the genus is named. The fruit is a schizocarp of three samaras, each with a dorsal wing. During the preparation of a monograph of *Stigmaphyllon*, I have noted eight additional new species and one new variety, all from South America, which are here described.

Stigmaphyllon adenodon var. **macropterum** C. Anderson, var. nov.—TYPE: ECUADOR. Napo: Baeza-Tena Rd, ca. 5 km N of Jondachi, ca. 1000 m, *Harling & Andersson 16398* (holotype: MICH!; isotype: GB!).

A *Stigmaphyllo adenodonte* var. *adenodonte* ala dorsali 5.3–6.5 cm longa et 1.5–2 cm lata differt.

Vine. Laminas 5–14.5 cm long, 3.5–15 cm wide, cordate or ovate or narrowly so to triangular (especially the smaller laminas), apex mucronate or acuminate-mucronate, base cordate or in smaller leaves truncate, glabrate to glabrous above, with T-shaped hairs below, margin with stipitate (nail-like) glands 0.2–0.6 mm long and apically disklike to 0.5 mm in diameter, with a pair of shallowly cupulate sessile glands at the apex of the petiole (to 3 mm below the lamina), each gland 1–2.5 mm in diameter; petioles 1.6–11.5 cm long. Flowers 15–30 (–40) per umbel or pseudoraceme, these borne in dichasia or compound dichasia or small thyrses; peduncles (0.8–) 1–2.75 times as long as pedicels. All petals with the limbs orbicular or sometimes broadly ovate, glabrous, margin erose or erose-denticulate; anterior-lateral petals: claw 2–2.5 (–3) mm long, limb 9.5–11 (–13) mm long and wide; posterior-lateral petals: claw 1.5–2.5 mm long, limb ca. 8–9 mm long and wide; posterior petal: claw (2.2–) 2.5–3 (–3.5) mm long, limb 8–8.5 (–10) mm long and wide. Stamens unequal, those opposite the posterior-petals the largest, anthers of those opposite the lateral sepals with the connective enlarged and the locules reduced or those opposite the posterior-lateral sepals with the locules equalling the connective or only slightly reduced; anthers pubescent. Anterior style 2.8–3.7 mm long, shorter than the posterior two; apex 1.8–2.4 mm long, each foliole 1.2–1.5 mm long, (0.5–) 0.8–1.1 (–1.3) mm wide, sometimes sublinear but more commonly narrowly oblong to oblong to parabolic; posterior styles 3.5–4.7 mm long, lyrate; folioles (1.3–) 1.8–2.5 mm long, (1.3–) 1.5–2.1 mm wide, oblong to subsquare. Dorsal wing of samara 5.3–6.5 cm long, 1.5–2 cm wide; nut with narrow winglets, up to 11 mm long and 3.5 mm wide, or with shallow ridges or crests, these often interconnected, nut 17–21 mm high, 12–19 mm in diameter, inflated,

locule surrounded by air chambers, areole 5.5–7 mm long, 5.5–6.5 mm wide, concave, carpophore up to 3.5 mm long. Embryo 8–10 mm long, 4.1–5 mm wide, ca. 2 times as long as wide, ovoid, outer cotyledon 12.5–15.5 mm long, 4.1–5 mm wide, the distal 2/5 folded over the inner cotyledon, inner cotyledon 3.5–7.3 mm long, 2.5–3.5 mm wide, straight.

Phenology. Collected in flower and fruit from December through February.

Distribution. Amazonian Ecuador and adjacent Peru; in wet areas, along rivers, and in rain forest and flooded forest; sea level to 1160 m.

Representative Specimens. **Ecuador.** Napo: San Pablo Aguarico, Río Shushufindi, *Lescure 2165* (MICH, NY).—Pastaza: Mera, *Harling 3779* (S). **Peru.** Amazonas: Río Cenepa above mouth of Río Huampami and prior to Chávez Valdivia, *Berlin 834* (GH, MO).

Stigmaphyllon adenodon Adr. Juss. is named for the distinctive stalked and apically flared (nail-shaped) marginal glands of the leaves. It is also characterized by its pubescent anthers, and samaras in which the enlarged nut consists of a locule surrounded by air chambers. Variety *macropterum* differs from var. *adenodon* in that the samara's wing is not reduced to a triangular winglet encircling the nut but is roughly narrowly rectangular, like that of most species.

The Peruvian collection (*Berlin 834*) here assigned to var. *macropterum* may represent, perhaps partly, a hybrid or possibly an apomictic population. It consists of fruiting branches as well as separate inflorescence branches in bud; most likely these were collected from different individuals. The samaras examined contain normal-appearing embryos and the anterior styles still retained have normal-appearing folioles. In the buds examined, the pollen is composed nearly 100% of non-staining, thick-walled, shrunken, misshapen grains. The anterior styles do not bear large folioles; the apex is only laterally expanded into a lip up to ca. 0.7 mm long and 0.5 mm wide.

Stigmaphyllon arenicola C. Anderson, sp. nov.—Type: Brazil. São Paulo: Mpio. Iguape, ca. 1 km WSW of city of Iguape, 24°43'S, 47°34'W, *Eiten & Clayton 6202* (holotype: UB!; isotypes: K! NY! SP! US!). Fig. 1.

Stigmaphyllon martianum var. β *variabile* Nied., Pflanzenreich IV. 141: 491. 1928.—Type: Brazil. São Paulo: Praia Grande near Santos, *Mosén 3350* (holotype: S!; isotypes: C! P!). The duplicates at C and P are also labeled *Glaziou 13604*; the fragments at NY (ex B) labeled *Glaziou 13604* are *S. urenifolium.*

Liana. Laminae 5.8–14.5 cm longae, 2.7–9.5 cm latae, lanceolatae vel triangulares vel ovatae vel ellipticae vel interdum 2–3-lobatae, supra glabrae vel glabratae, subtus glabrae vel glabratae vel interdum sparsim sericeae, margine eglanduloso vel sparsim glanduloso. Inflorescentia solitaria vel dichasialis constata ex umbellis, floribus in quaque umbella ca. 10–30. Pedunculi 3.5–13.5 mm longi; pedicelli 4–10.5 mm longi. Petala limbo orbiculari, margine fimbriato vel denticulato-fimbriato. Stamina heteromorpha, antheris glabris; antherae sepalis lateralibus oppositae steriles vel 1–2 loculis reductis instructae. Stylus anticus 3–4 mm longus, glaber, utroque foliolo 1.2–1.6 mm longo, 1.1–1.8 mm lato, subquadrato vel suborbiculari; styli postici 3.6–4.5 mm longi, glabri, lyrati, foliolo 2–3 mm longo, (1.7–) 2–2.6 mm lato, subquadrato vel interdum subrectangulari. Samara ala dorsali 2.8–3 cm longa, 0.9–1 cm lata; alulae laterales absentes; nux 6.5–7.5 mm alta, ca. 4.5 mm diametro.

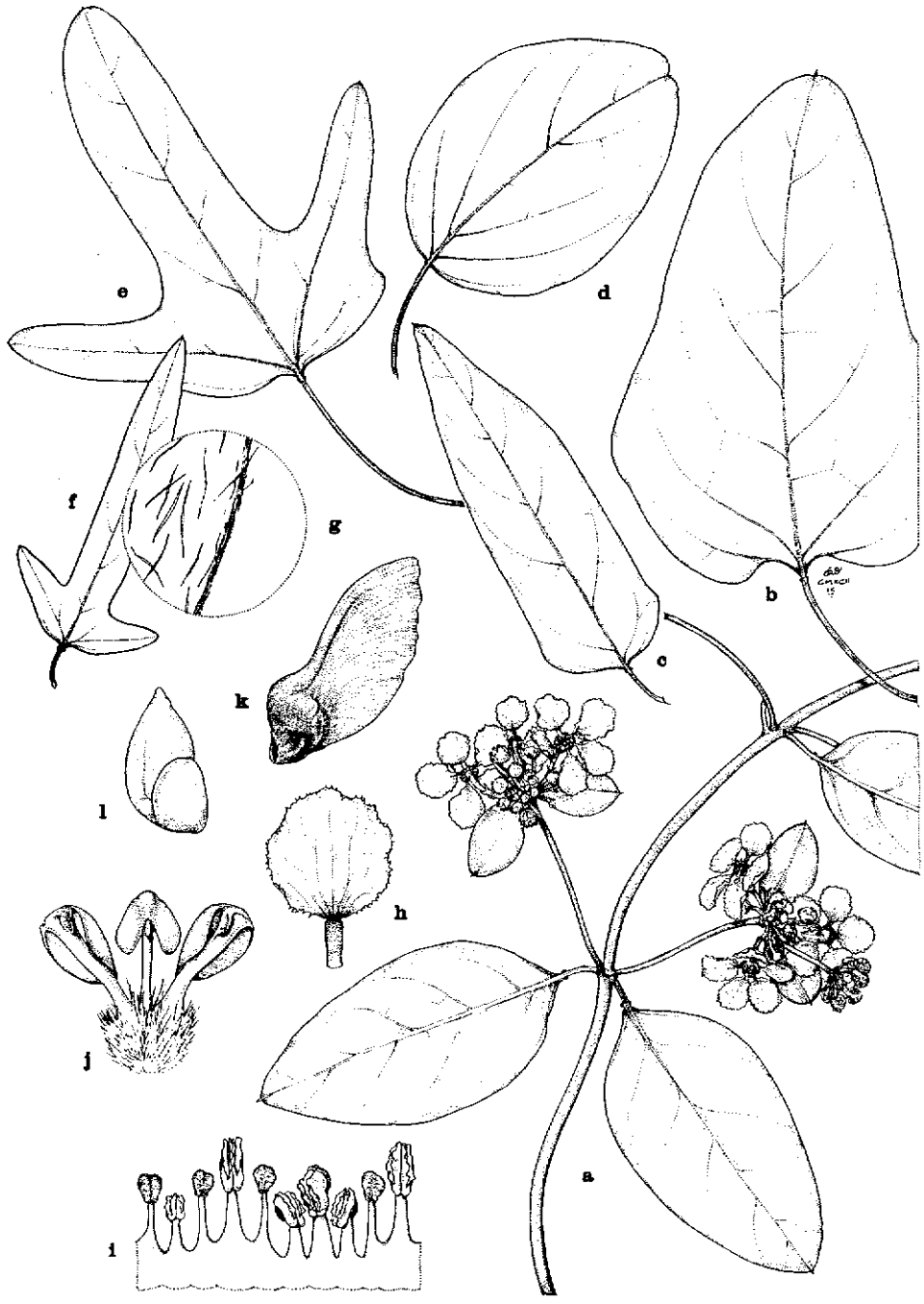

FIG. 1. *Stigmaphyllon arenicola.* a. Flowering branch (×0.5). b–f. Leaves illustrating variation of laminar shape (×0.5). g. Detail of abaxial leaf surface (×10). h. Posterior petal (×2). i. Androecium (×5); second stamen from left opposing posterior petal. j. Gynoecium (×5); posterior styles bent slightly outward to show anterior style (in center). k. Samara (×1). l. Embryo (×2.5). (Based on: a, *Eiten & Clayton 6202;* b, *Markgraf 3783;* c, f, g, *Eiten & Eiten 2800;* d, k, l, *Almeida de Jesus 1564;* e, *Anderson 11197;* h, i, *Angeli 475;* j, *Smith & McWilliams 15354.*)

Vine to 4 m. Laminas 5.8–14.5 cm long, 2.7–9.5 cm wide, lanceolate to triangular to ovate to elliptical but often 2–3-lobed, apex acute-mucronate to obtuse-mucronate or emarginate-mucronate, base attenuate or truncate to cordate, glabrous or glabrate above, glabrous or glabrate or sometimes sparsely to rarely moderately sericeous below but with abundant hairs along the margin (the hairs sometimes sloughed off in older laminas), margin eglandular or sometimes with irregularly spaced sessile glands (0.2–0.3 mm in diameter) borne adjacent to the margin below, the lateral lobes sometimes terminating in a filiform gland up to 0.1 mm long, with a pair of prominent but sessile glands at the apex of the petiole, each gland 1.1–2.5 mm in diameter; petioles 1–11 cm long; stipules 0.5–1.7 mm long. Flowers ca. 10–30 per umbel, these borne solitary or in dichasia or compound dichasia; peduncles 3.5–13.5 mm long; pedicels 4–10.5 mm long; peduncles 0.6–1.6 times as long as the pedicels; bracts 1–2 mm long, 0.5–1.4 mm wide, triangular or narrowly so; bracteoles 1–1.8 mm long, 0.8–1.1 mm wide, triangular. Sepals 2.1–2.5 mm long, 2–2.7 mm wide, glands 1.7–2.7 (–3.2) mm long, 1–1.5 mm wide. All petals with the limbs orbicular, glabrous, margin fimbriate or denticulate-fimbriate, teeth/fimbriae up to 0.3 (–0.5) mm long; anterior-lateral petals: claw 2–3 mm long, limb 12–14 mm long and wide; posterior-lateral petals: claw 1–1.8 mm long, limb 10–12.5 mm long and wide; posterior petal: claw 2.5–3.7 mm long, apex usually indented, limb 9–10 mm long and wide, sometimes margin near the base with 1–2 stout gland-tipped fimbriae per side, these ca. 0.5 mm long, ca. 0.2 mm wide. Stamens unequal, those opposite the posterior-lateral petals the largest, those opposite the lateral sepals eloculate or sometimes the enlarged connective with 1 or rarely 2 reduced locules; anthers glabrous. Anterior style 3–4 mm long, shorter than the posterior two or sometimes subequal, glabrous; apex 1.3–1.9 mm long, each foliole 1.2–1.6 mm long, 1.1–1.8 mm wide, subsquare or suborbicular. Posterior styles 3.6–4.5 mm long, glabrous or with scattered hairs in the proximal 1/3–1/2, lyrate; foliole 2–3 mm long, (1.7–) 2–2.6 mm wide, subsquare to sometimes subrectangular. Dorsal wing of samara 2.8–3 cm long, 0.9–1 cm wide, upper margin with a blunt tooth; nut 6.5–7.5 mm high, ca. 4.5 mm in diameter, smooth or with a few spurs, areole 2.7–4.5 mm long, 3–3.5 mm wide, concave, carpophore up to 3.5 mm long. Embryo 6.5–8.1 mm long, 1.5–2 times as long as wide, ovoid, outer cotyledon 8–9.5 mm long, 4.1–4.3 mm wide, the distal 2/3 folded over the inner cotyledon, inner cotyledon 4–5 mm long, 2.9–3.5 mm wide, straight.

Phenology. Collected in flower throughout the year, in fruit from May through July.

Distribution. Southeastern Brazil, Rio de Janeiro to Paraná; along beaches, on dunes, in restingas, one report from vicinity of coastal swamp forest; sea level to 340 m.

Representative Specimens. **Brazil.** Paraná: Mpio. Guaraqueçaba, Tagaçaba, *Hatschbach 42721* (MICH); Ilha do Mel, Prainha, *Kummrow 1334* (MBM); Ilha do Mel, Mpio. Panaguá, *Ribas 9* (MICH).—Rio de Janeiro: Lagoa de Marapendi, estrada do Autódromo, *Almeida de Jesus 1564* (RB); restinga ca. 11 km W of Barra da Tijuca, *Anderson 11197* (MBM, MICH); restinga de Jacarepaguá, *Angeli 475* (MICH); restinga de Jacarepaguá, Pedro de Itauna, *Araujo 657 & Peixoto 490* (MICH, RB); Recreio do Bandeirantes, *Lutz R23973* (R); restinga de Sernambetiba, *Markgraf 3783* (RB); Recreio dos Bandeirantes, Jacarepaguá, *Palacios et al. 4061* (R); 1–3 km S of Lidice, *Smith & McWilliams 15354* (MICH, R); pr. Bonfim, *Trinta 882 & Fromm 1958* (R).—São Paulo: Iguape, Morro das Pedras, *Brade 7898* (R); Santos, *Curran 13* (US); between Ubatuba and Caraguatuba, 10 m, *Davis et al. D59894* (E, MBM); Mpio. Mongaguá, at Mongaguá, *Eiten & Eiten 2542* (SP);

Mpio. Caraguatatuba, SW of Caraguatatuba, *Eiten & Eiten 2800* (SP); Mongaguá, praia de Suarão, *Kirizawa 67* (SP); Mpio. Ilha do Cardoso, *Leitão Filho 10792* (SP); Praia Grande, Praia Piassabusú, *Löfgren 4160* (SP); Ubatuba, *C. Smith 4844* (SP); rd between São Vicente and Itaipu, 24°00'S, 46°24'W, *L. B. Smith 2000* (GH); Ilha Bela, Serra do Castelhanos, *Sucre 6982* (MICH, SP).

Stigmaphyllon arenicola, a species of sandy areas of coastal southeastern Brazil, is notable for its polymorphic leaves. The laminas vary from lanceolate to triangular to ovate to elliptical but may also be 2–3-lobed. They are most commonly very sparsely sericeous to glabrate below but sometimes are glabrous or sericeous. Mostly, the mature laminas are glabrous to glabrate, whereas the younger laminas and the reduced ones near and in the inflorescences are at least sparsely sericeous; however, plants with all of the laminas abaxially sericeous or glabrous also occur. The anthers are glabrous. Those of stamens opposite the lateral sepals usually lack locules, but sometimes the enlarged connectives bear 1 or rarely 2 reduced locules. *Stigmaphyllon arenicola* might be confused with the partly sympatric *S. lalandianum*, in which the laminas are sericeous abaxially. *Stigmaphyllon lalandianum* is readily separated by its small flowers with erose petals (the lateral limbs up to only 10 mm in diameter); all stamens bear locules, and the styles are efoliolate or bear only tiny folioles less than 1 mm long.

Stigmaphyllon crenatum C. Anderson, sp. nov.—TYPE: BRAZIL. Espírito Santo: Rio Pancas, Aldeiamento dos Indios, *Buena 156* (holotype: R-37607!). Fig. 2.

Liana. Laminae 5.5–13.5 cm longae, 4.5–11.3 cm latae, late ellipticae vel suborbiculares, margine crenato, sinubus glanduloso, laminae juniores et inflorescentiae supra dense sericeae et subtus pilis T-formibus dense instructae, laminae vetustiores utrinque glabrae vel glabratae. Inflorescentia solitaria vel dichasialis vel thrysiformis constata ex umbellis, floribus in quaque umbella ca. 10. Petala limbo orbiculari, margine eroso-denticulato. Stamina heteromorpha, antheris glabris. Stylus anticus ca. 2 mm longus, apice ca. 2 mm longo, ca. 0.4 mm lato, lineari; styli postici ca. 3.2 mm longi, lyrati, foliolo ca. 1.2 mm longo latoque, parabolico. Samara ignota.

Vine. Laminas 5.5–13.5 cm long, 4.5–11.3 cm wide, broadly elliptical to suborbicular, apex obtuse or emarginate or emarginate-mucronate or mucronate, base truncate to cordate, densely sericeous above and densely beset with T-shaped hairs below in young leaves and those near the inflorescence, the older laminas glabrate to glabrous above and below, margin irregularly crenate, each sinus with a circular flush gland 0.7–1.7 mm in diameter, with a pair of glands borne halfway on the petiole, these flush with the epidermis and margined, each gland 1.3–2.5 mm in diameter; petioles up to 2 mm long; stipules absent (?). Flowers ca. 10 per umbel, these borne solitary or in dichasia or compound dichasia or small thyrses; peduncles 5–7 mm long (?); pedicels ca. 6 mm long (?); peduncles subequal to the pedicels (?); bracts 0.8–1.2 mm long and wide, broadly triangular; bracteoles 1–1.3 mm long, 0.8–1 mm wide. Sepals ca. 3 mm long, ca. 2 mm wide, glands 2–2.3 mm long, ca. 1 mm wide. Lateral petals with the limbs orbicular, glabrous, margin erose-denticulate; anterior-lateral petals: claw ca. 3 mm long, limb 13–14 mm long and wide; posterior-lateral petals: claw ca. 1.5 mm long, limb ca. 12 mm long and wide; posterior petal not seen. Stamens unequal, anthers of those opposite the anterior-lateral sepals with the connective enlarged and the locules reduced; anthers glabrous (anthers of posterior-lateral and posterior stamens only seen in

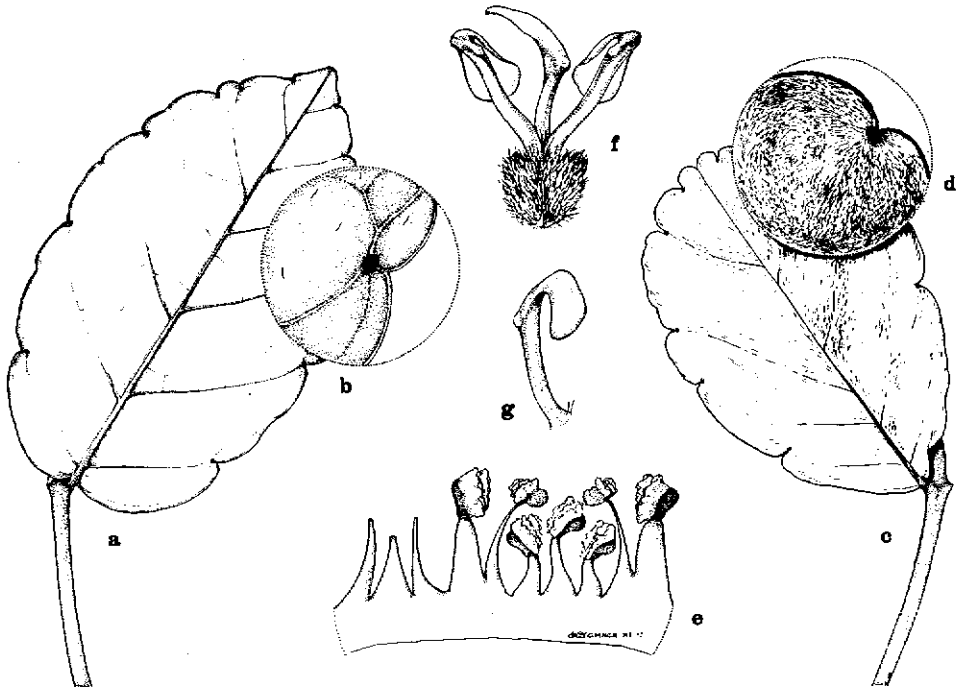

FIG. 2. *Stigmaphyllon crenatum*. a. Glabrous leaf (×0.5). b. Detail of abaxial surface of glabrous leaf with marginal gland (×2). c. Pubescent leaf (×0.5). d. Detail of abaxial surface of pubescent leaf with marginal gland (×2). e. Androecium (×5); fourth stamen from right opposing anterior sepal; anthers of stamens opposing posterior petal and posterior-lateral sepals not seen. f. Gynoecium (×7.5); anterior style in center. g. Lateral view of posterior style (×7.5). (Based on: a, b, *Duarte 400;* c–g, *Buena 156.*)

young bud). Anterior style ca. 2 mm long, shorter than the posterior two, terete proximally, laterally flattened in the distal 1/4, glabrous; apex ca. 2 mm long including a spur ca. 1 mm long, ca. 0.4 mm wide, linear, folioles absent. Posterior styles ca. 3.2 mm long, terete, with scattered hairs in the proximal 1/4, lyrate; foliole ca. 1.2 mm long and wide, parabolic to triangular. Samara not seen.

Phenology. Collected in flower in July, November, and December.

Distribution. Northern Espírito Santo, Brazil; in campo rupestre, on rock faces.

ADDITIONAL SPECIMENS EXAMINED. **Brazil.** ESPÍRITO SANTO: Mpio. Venecia, *Duarte 4000* (RB); Colatina, Rio Pancas, *J. Kuhlmann 6651* (RB).

Stigmaphyllon crenatum is the only species in the genus with nearly sessile deeply crenate leaves. Each sinus is marked by a gland up to 1.7 mm in diameter. In many species, leaves of older plants have shed some or sometimes all of the vesture. This phenomenon is apparently particularly strongly expressed in *S. crenatum*. The type, collected in July, consists of three flowering branchlets, one of which bears two pairs of leaves. These laminas are densely sericeous above; the abaxial dense silvery pubescence is composed of T-shaped hairs. In *Duarte 4000* and *J. Kuhlmann 6651*, collected in November and December, only the dichasially branched inflorescence axes are retained, and the leaves are glabrous, though on some laminas patches of hairs remain; the immature leaves at branch apices bear

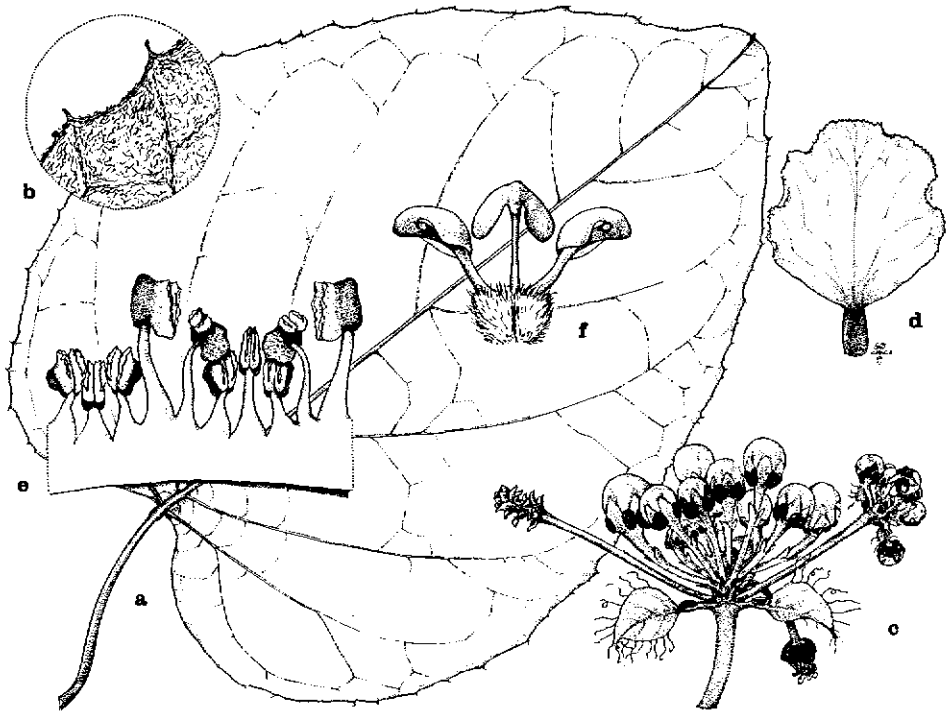

FIG. 3. *Stigmaphyllon ecuadorense.* a. Large leaf (×0.5). b. Detail of abaxial leaf surface (×2.5). c. Portion of inflorescence (×1). d. Posterior petal (×2). e. Androecium (×5); second stamen from left opposing posterior petal. f. Gynoecium (×5); posterior styles bent slightly outward to show anterior style (in center). (Based on: a, b, *Steiner 219;* c–f, *Wunderlin et al. 8736.*)

the typical vesture. The flowers are distinctive in that the apex of the anterior style is drawn out into a long claw but lacks folioles; the posterior styles are both foliolate. The only mature flower on the type lacks the posterior petal and the anthers of the posterior and posterior-lateral stamens. Examination of a bud indicates that these anthers all have two locules, but it was not apparent whether the anthers of the posterior-lateral stamens would bear an enlarged connective at maturity.

Stigmaphyllon ecuadorense C. Anderson, sp. nov.—TYPE: ECUADOR. Manabi: 44 km W of El Empalme on rd from Quevedo to Portoviejo, 1100 ft, 6 Aug 1980, *Wunderlin et al. 8736* (holotype: SEL!; isotype: MO!). Fig. 3.

Liana. Laminae 10–23 cm longae, 8.5–20.5 cm latae, late ovatae vel late cordatae vel suborbiculares, supra glabrae vel glabratae, subtus tomentosae, margine sparsim glanduloso. Inflorescentia dichasialis constata ex pseudoracemis, floribus in quoque pseudoracemo ca. 20–40. Pedunculi 7.5–13.5 mm longi; pedicelli 8–10 mm longi. Petala limbo orbiculari, margine eroso vel eroso-denticulato. Stamina heteromorpha, antheris glabris; antherae sepalis antico-lateralibus oppositae loculis reductis instructae. Stylus anticus ca. 3.5 mm longus, glaber, utroque foliolo 1.6–2 mm longo, ca. 1.6–1.7 mm lato, subquadrato vel subrectangulari; styli postici 4.3–4.7 mm longi, glabri, lyrati, foliolo ca. 2.5 mm longo, 2.3–2.5 lato, suborbiculari. Samara immatura ala dorsali ca. 4 cm longa, ca. 1.5 cm lata; alulae laterales ca. 8 mm longae, ca. 3.5 mm latae.

Vine. Laminas 10–23 cm long, 8.5–20.5 cm wide, broadly ovate to broadly cordate to suborbicular, apex emarginate-mucronate, base truncate in the smaller laminas to cordate in the larger, glabrate to glabrous above, tomentose below, margin very shallowly dentate and the teeth terminating in filiform glands (up to 4 mm long, broken in large leaves) or irregularly spaced subsessile to stalked glands (0.2–0.4 mm in diameter, 0.1–0.5 mm long), with a pair of prominent but sessile glands at the apex of the petiole, each gland 1.7–2.6 mm in diameter; petioles 3–7.5 cm long; stipules 0.6–0.8 mm long. Flowers ca. 20–40 per pseudoraceme, these borne in compound dichasia; peduncles 7.5–13.5 mm long; pedicels 8–10 mm long; peduncles 0.9–1.6 times as long as the pedicels; bracts 1.4–2.2 mm long, 1–1.5 mm wide, triangular; bracteoles 1.5–2.2 mm long, 1.1–1.6 mm wide, oblong. Sepals 2.5–3 mm long and wide, glands 3–3.5 mm long, ca. 1.5 mm wide. All petals with the limbs orbicular, glabrous, margin erose or erose-denticulate, the teeth up to 0.3 mm long; anterior-lateral petals: claw ca. 3 mm long, limb 14–15 mm long and wide; posterior-lateral petals: claw 1.6–2 mm long, limb ca. 13 mm long and wide; posterior petal: claw ca. 3 mm long, apex indented, limb ca. 12 mm long and wide. Stamens unequal, those opposite the posterior-lateral petals the largest, anthers of those opposite the anterior-lateral sepals with the connective enlarged and the locules reduced; anthers glabrous. Anterior style ca. 3.5 mm long, shorter than the posterior two, terete, glabrous; apex 1.9–2.2 mm long; each foliole 1.6–2 mm long, ca. 1.6–1.7 mm wide, subsquare to subrectangular. Posterior styles 4.3–4.7 mm long, glabrous, lyrate; foliole ca. 2.5 mm long, 2.3–2.5 mm wide, suborbicular. Immature samara with a dorsal wing up to 4 cm long and 1.5 cm wide, the nut with a pair of lateral winglets up to 8 mm long and 3.5 mm wide.

Phenology. Collected in flower in July and August, in young fruit in August.

Distribution. Ecuador, Manabi; brushy roadsides; 300–400 m.

Additional Specimens Examined. **Ecuador.** Manabi: 7.5 km W of Río Daule at Pichincha, *Steiner 219* (DAV, MICH).

Stigmaphyllon ecuadorense is a showy species notable for its large leaves and large flowers disposed in pseudoracemes. The laminas are tomentose below and have a shallowly dentate margin, the teeth terminating in filiform glands. The limbs of the lateral petals are 13–15 mm in diameter and have an erose or erose-denticulate margin; the anthers of stamens opposite the posterior-lateral sepals have the connective and locules about equally long. The only other species of *Stigmaphyllon* reported from Manabi are *S. eggersii* C. Anderson and *S. ellipticum* (H. B. K.) Adr. Juss., which also have large flowers but with fimbriate to lacerate limbs; the anthers of stamens opposite the lateral sepals have the connective enlarged and the locules reduced. Their laminas are borne on short petioles (up to 3 cm long) and have eglandular margins. *Stigmaphyllon ecuadorense* might be confused with *S. sinuatum* (DC.) Adr. Juss., of the Amazonian region, in which the flowers are also borne in pronounced pseudoracemes and the anthers of stamens opposite the posterior-lateral sepals are unmodified. *Stigmaphyllon sinuatum* is readily separated by the sericeous abaxial pubescence of the laminas.

Stigmaphyllon eggersii C. Anderson, sp. nov.—Type: Ecuador. Manabi: Estero Perro Muerto, Machalilla National Park, below San Sebastián, 01°36'N, 80°42'W, *Gentry & Josse 72667* (holotype: M!; isotypes: A! US!).

Liana. Laminae 5.3–18 cm longae, 3–10.7 cm latae, ovatae vel late ellipticae, supra glabrae vel interdum sparsim sericeae, subtus pilos T-formes ferentes, margine eglanduloso. Inflorescentia solitaria vel dichasialis constata ex pseudoracemis, floribus in quoque pseudoracemo ca. 8–15. Pedunculi 1.8–9 mm longi; pedicelli 6–9 mm longi. Petala limbo orbiculari, margine fimbriato vel fimbriato-lacerato. Stamina heteromorpha, antheris glabris; antherae sepalis lateralibus oppositae loculis reductis instructae. Stylus anticus 3–3.3 mm longus, glaber, utroque foliolo 0.3–0.7 mm longo, 0.4–0.5 mm lato, parabolico; styli postici ca. 3.2 mm longi, glabri, foliolo 0.5–1 mm longo, 0.4–0.8 mm lato, parabolico. Samara immatura ala dorsali ca. 2.3 cm longa, ca. 1.2 cm lata; alulae laterales absentes.

Vine. Laminas 5.3–18 cm long, 3–10.7 cm wide, ovate to broadly elliptical, apex mucronate or emarginate-mucronate to acuminate, base cordate to truncate, glabrous above, with T-shaped hairs below, margin eglandular, with a pair of prominent but sessile glands at the apex of the petiole, each gland 1–1.7 mm in diameter; petioles 1.2–3 cm long; stipules 0.5–1.2 mm long. Flowers ca. 8–15 per condensed pseudoraceme, these borne solitary or in dichasia or compound dichasia; peduncles 1.8–9 mm long, sericeous or sparsely so; pedicels 6–9 mm long, glabrous; peduncles 0.3–1.3 times as long as the pedicels; bracts 1.2–1.8 mm long, 0.7–1.1 mm wide, triangular; bracteoles 1–1.6 mm long, 0.7–1 mm wide, ovate. Sepals 2.5–3 mm long, 2.5–2.8 mm wide, glands 1.8–2.5 mm long, 0.8–1.3 mm wide. All petals with the limbs orbicular, glabrous, margin fimbriate to fimbriate-lacerate, fimbriae and teeth up to 1.6 mm long; anterior-lateral petals: claw 2.5–2.8 mm long, limb 14–15 mm long and wide; posterior-lateral petals: claw ca. 2 mm long, limb 13–14 mm long and wide; posterior petal: claw 3.6–4.5 mm long, apex indented, limb 10–12 mm long and wide. Stamens unequal, those opposite the anterior-lateral sepals with the longest filaments, anthers of those opposite the lateral sepals with the connective enlarged and the locules reduced; anthers glabrous. Anterior style 3–3.3 mm long, subequal to the posterior two, glabrous; apex 1.1–1.5 mm long, folioles variable in size, each foliole 0.3–0.7 mm long, 0.4–0.5 mm wide, parabolic. Posterior styles ca. 3.2 mm long, glabrous, slightly lyrate; foliole 0.5–1 mm long, 0.4–0.8 mm wide, parabolic. Mature samara not seen; dorsal wing of nearly mature samara ca. 2.3 cm long, ca. 1.2 cm wide, upper margin with a shallow blunt tooth, lateral winglets absent; nut ca. 4.5 mm high, ca. 3.5 mm in diameter, areole ca. 3.5 mm long, ca. 2.3 mm wide, concave but convex at center, carpophore up to ca. 1 mm long. Embryo not seen.

Phenology. Collected in flower in January and October, in immature fruit in January.

Distribution. Lowlands of Ecuador (Guayas, Manabi); in wet forest and matorral; sea level to 470 m.

Additional Specimens Examined. **Ecuador.** Guayas: Balao, Jan 1892, *Eggers 14335* (A, M, US); Cantón Naranjal, camino de Santa Rosa de Flandres a Puerto Baquerizo, *Valverde 880* (MO).—Manabi: Rd Santa Elena-Jipijapa, Río Pital at Puerto López, 01°34'S, 80°48'W, *Holm-Nielsen et al. 27837* (AAU).

Stigmaphyllon eggersii is most similar to the widespread and sympatric *S. ellipticum*, with which it shares large flowers with fimbriate-lacerate petals. They are most readily separated by their leaf pubescence. The laminas of *S. eggersii* are pubescent with T-shaped hairs below, whereas those of *S. ellipticum* are sparsely sericeous below and usually appear glabrous to the naked eye.

This species is named for the Danish botanist Heinrich Franz Alexander von Eggers (1844–1903), who first collected it.

Stigmaphyllon glabrum C. Anderson, sp. nov.—TYPE: BRAZIL. Espírito Santo: Mpio. Castelo, estrada do Bocó, 20 Aug 1987, *Hatschbach 51343* (holotype: MBM!; isotype: MICH!).

Liana. Laminae 14.2–15.3 cm longae, ca. 12 cm latae, utrinque glabrae, margine sparsim glanduloso, laminae caulinae 5–7-pinnatifidae, laminae parvae inflorescentiae non lobatae, ovatae vel ellipticae. Inflorescentia dichasialis constata ex umbellis, floribus in quaque umbella ca. 15–20. Pedunculi 5–6 mm longi; pedicelli 7–9.5 mm longi. Petala limbo orbiculari, margine fimbriato. Stamina subaequalia, antheris glabris. Stylus anticus ca. 3.2 mm longus, apice ca. 1 mm longo, ca. 0.2 mm lato, lineari; styli postici ca. 3.5 mm longi, lyrati, apice ca. 0.7 mm longo, ca. 0.1 mm lato, lineari. Samara immatura ala dorsali longa, alulae laterales absentes.

Vine. Laminas 14.2–15.3 cm long, ca. 12 cm at widest part, pinnately 5–7-lobed, the smaller leaves associated with the inflorescence unlobed and elliptical to ovate, apex of each lobe terminating in a filiform gland, base auriculate, glabrous above and below, margin with filiform glands and rarely also with a few irregularly spaced sessile glands ca. 0.4 mm in diameter, with a pair of prominent stalked glands at the apex of the petiole, each gland 0.5–0.7 mm long, 1.5–2.2 mm in diameter; petioles ca. 6 cm long; stipules not seen. Flowers ca. 15–20 per umbel, these borne in compound dichasia; peduncles 5–6 mm long; pedicels 7–9.5 mm long; peduncles 0.6–0.8 times as long as the pedicels; bracts 1.3–1.7 mm long, 0.9–1 mm wide, triangular; bracteoles 1.5–1.8 mm long, 1–1.3 mm wide, triangular. Sepals ca. 3 mm long, ca. 2.8 mm wide, glands ca. 1.5 mm long, ca. 1 mm wide. All petals with the limbs orbicular, glabrous, suffused with red (?), margin fimbriate, fimbriae up to 1 mm long; anterior-lateral petals: claw ca. 2.5 mm long, limb 15–16 mm long and wide; posterior-lateral petals: claw ca. 1.5 mm long, limb 14–15 mm long and wide; posterior petal: claw ca. 4 mm long, apex indented, limb ca. 10 mm long and wide. Stamens unequal in size but subequal in shape, those opposite the anterior-lateral sepals the largest; anthers glabrous. Anterior style ca. 3.2 mm long, slightly shorter than the posterior two, glabrous; apex ca. 1 mm long including a spur ca. 0.1 mm long, linear, folioles absent. Posterior styles ca. 3.5 mm long, glabrous or with a few scattered hairs in the proximal 1/2, lyrate; apex ca. 0.7 mm long, blunt distally, folioles absent. Immature samara with a large flared dorsal wing, nut without lateral winglets or ornamentation.

Stigmaphyllon glabrum is known only from the type. It is distinguished by its pinnately lobed and glabrous leaves, long-fimbriate petals, and efoliolate styles. The androecium is unusual in that the stamens opposite the anterior-lateral sepals have longer filaments than the ones opposite the posterior-lateral petals; in most species, the reverse is true. *Stigmaphyllon urenifolium* Adr. Juss. of Minas Gerais and central Bahia is very similar, but the laminas are abundantly pubescent with T-shaped hairs below instead of glabrous.

Stigmaphyllon goudotii C. Anderson, sp. nov.—TYPE: COLOMBIA. Antioquia: vicinity of Medellín, Los Micos, 18 Dec 1927, *Toro 809* (holotype: NY!). Fig. 4.

Liana. Laminae 8.2–13 cm longae, 5.5–10.5 cm latae, ovatae vel cordatae, supra glabrae, subtus pilos T-formes sparsos ferentes, margine sparsim glanduloso.

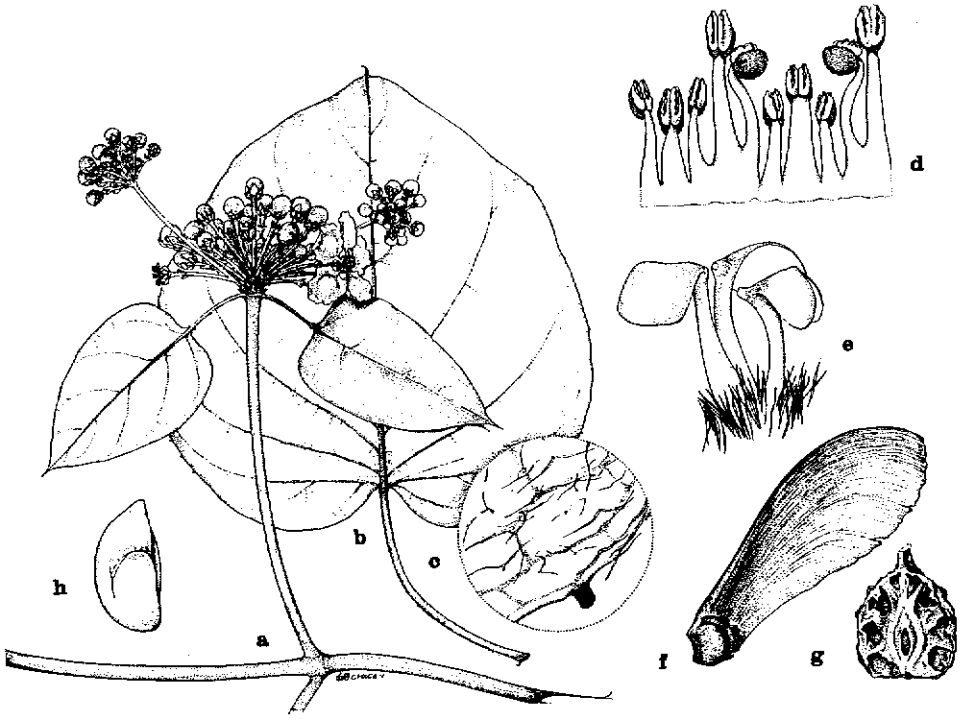

FIG. 4. *Stigmaphyllon goudotii*. a. Flowering branch (×0.5). b. Large leaf (×0.5). c. Detail of abaxial leaf surface (×10). d. Androecium (×5); second stamen from left opposing posterior petal. e. Gynoecium (×5); anterior style at right. f. Samara (×0.75). g. Longitudinal section through nut to show locule surrounded by air chambers (×1.5). h. Embryo (×2.5). (Based on: a, d, e, *Toro 809;* b, c, f, g, *Goudot s.n.;* h, *Holton 795*.)

Inflorescentia dichasialis vel thyrsiformis constata ex pseudoracemis, floribus in quoque pseudoracemo ca. 35–50. Pedunculi 15–21 mm longi; pedicelli 4–5.5 mm longi. Petala limbo orbiculari, margine eroso. Stamina heteromorpha, antheris glabris; antherae sepalis antico-lateralibus oppositae 1–2 loculis reductis instructae. Stylus anticus ca. 3.5 mm longus, utroque foliolo ca. 1.5 mm longo, ca. 1.2 mm lato, elliptico vel parabolico; styli postici ca. 4.2 mm longi, lyrati, foliolo ca. 2 mm longo latoque, subquadrato. Samara ala dorsali 4.5–5.5 cm longa, 1.9–2.2 cm lata; alulae laterales absentes; nux usque ad 15 mm alta, usque ad ca. 10 mm diametro, latere utroque alulis vel calcaribus vel cristaris instructa.

Vine. Laminas 8.2–13 cm long, 5.5–10.5 cm wide, ovate to cordate, apex acuminate, base truncate to cordate, glabrous above, sparsely pubescent with T-shaped hairs below, margin eglandular or with irregularly spaced prominent glands (0.2 mm in diameter and long), with a pair of shallowly cupulate glands at the apex of the petiole, each gland 1–1.5 mm in diameter, up to 0.3 mm high; petioles 3.2–6.5 cm long; stipules 0.7–0.8 mm long. Flowers ca. 35–50 per pseudoraceme, these borne in dichasia or compound dichasia or small thyrses; peduncles 15–21 mm long; pedicels 4–5.5 mm long; peduncles (1.5–) 3.4–4.2 times as long as the pedicels; bracts 1.8–2.2 mm long, 0.8–1.1 mm wide, narrowly triangular; bracteoles 1.6–2 mm long, 0.8–1 mm wide, triangular. Sepals ca. 2.2 mm long and wide, glands ca. 2 mm long, ca. 1.2 mm wide. All lateral petals with the limbs orbicular, glabrous, margin erose; anterior-lateral petals: claw ca. 1 mm long, limb ca. 10 mm long and wide; posterior-lateral petals: claw ca. 2.3 mm long, limb ca. 12 mm

long and wide; posterior petal: claw ca. 3 mm long, apex indented, limb ca. 10 mm long, ca. 8 mm wide, obovate. Stamens unequal, those opposite the posterior-lateral petals the largest, anthers of those opposite the anterior-lateral sepals with the connective enlarged and the locules reduced; anthers glabrous. Anterior style ca. 3.5 mm long, shorter than the posterior two, glabrous; apex 1.5 mm long, each foliole ca. 1.5 mm long, ca. 1.2 mm wide, elliptical to parabolic. Posterior styles ca. 4.2 mm long, glabrous, lyrate; foliole ca. 2 mm long and wide, subsquare. Dorsal wing of samara 4.5–5.5 cm long, 1.9–2.2 cm wide, upper margin with a shallow blunt tooth or without a tooth; nut bearing 1–2 rectangular lateral winglets, these 2–5 mm long, 2–3 mm wide, and/or spurs (ca. 1 mm long) and crests; nut to 15 mm high, to ca. 10 mm in diameter, locule surrounded by air chambers, areole ca. 3 mm long and wide, concave, carpophore up to 8 mm long. Embryo ca. 8 mm long, ca. 2 times as long as wide, ovoid, outer cotyledon ca. 13 mm long, ca. 4 mm wide, the distal 2/5 folded over the inner cotyledon, inner cotyledon ca. 5.5 mm long, ca. 2.5 mm wide, straight.

Phenology. Collected in flower in December, in fruit in February and November.

Distribution. Colombia (Antioquia, Tolima, and Valle); in dry tropical forest; 1350 m.

Additional Specimens Examined. **Colombia.** Antioquia: Mpio. Giraldo, Corregimiento Manglares, 8 km de Manglares, via Santa Fé-Mutatá, 06°40'N, 75°55'W, *Callejas et al. 5608* (MICH).—Tolima: Ibague, El Tejas, *Goudot s.n.* (P).—Valle: La Paila, *Holton 795* (K, NY).

Stigmaphyllon goudotii is distinguished by its large compound inflorescences composed of 35–50-flowered pseudoracemes and large samaras. Only the stamens opposite the anterior-lateral sepals have the connective enlarged and the locules somewhat reduced; all anthers are glabrous. The samara is unusual in that the thick-walled locule is surrounded by air chambers and contains a large embryo.

This species is named for the French naturalist Justin Goudot, who first collected it during his explorations of Colombia from 1825 until 1842 (Lasègue 1845).

Stigmaphyllon jobertii C. Anderson, sp. nov.—Type: Brazil. Piauí: Nazareth, Rio Piauí, 1877–78, *Jobert 1114* (holotype: P!). Fig. 5.

Liana. Laminae 6.5–10.3 cm longae, 5.5–7 cm latae, cordatae, supra glabrae, subtus glabrae vel glabratae vel sparsissime sericeae, margine eglanduloso, petiolo glandulibus binatis stipitatis instructo. Inflorescentia dichasialis constata ex pseudoracemis, floribus in quoque pseudoracemo ca. 10–15. Pedunculi 2–2.5 mm longi; pedicelli 5.6–6.5 mm longi. Petala ignota. Stamina heteromorpha, antheris glabris. Stylus anticus ca. 2.6 mm longus, utroque foliolo ca. 1.2 mm longo, ca. 0.8 mm lato, triangulari; styli postici ca. 3 mm longi, parum lyrati, foliolo ca. 1.3 mm longo, ca. 0.6 mm lato, parabolico. Samara ala dorsali ca. 2.6 cm alta, ca. 1.4 cm lata; alulae laterales absentes; nux 6.5–7.5 mm alta, 3.5–4.5 mm diametro, loculo in contextu spongioso incluso.

Vine. Laminas 6.5–10.3 cm long, 5.5–7 cm wide, cordate, apex apiculate, base cordate to auriculate in the largest laminas, glabrous above, very sparsely sericeous but soon becoming glabrate to glabrous below, margin eglandular, with a pair of stalked glands on the petiole up to 3 mm below the base of the lamina, often inserted obliquely, each gland 0.8–1.5 mm long, 0.6–0.9 mm in diameter; petioles from 3 cm long (petioles of larger leaves not seen); stipules 0.6–1 mm long. Flowers ca. 10–15 per pseudoraceme, these borne in dichasia or small thyrses;

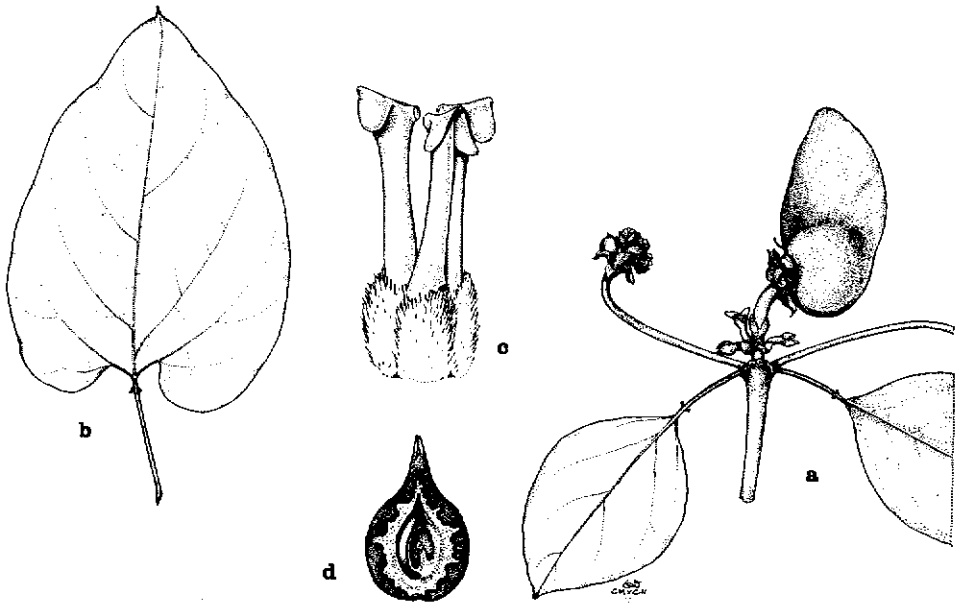

FIG. 5. *Stigmaphyllon jobertii.* a. Portion of inflorescence bearing one samara (×1). b. Leaf (×0.5). c. Gynoecium (×7.5); anterior style in center. d. Longitudinal section through nut to show locule embedded in spongy tissue (×1). (Based on *Jobert 1114.*)

peduncles 2–2.5 mm long; pedicels 5.6–6.5 mm long; peduncles ca. 0.4 times as long as the pedicels; bracts 1.8–2.3 mm long, 1.8–2 mm wide; bracteoles 1.5–1.7 mm long and wide. Sepals ca. 2.5 mm long, 2.5–3 mm wide, glands 1.8–2 mm long, ca. 1 mm wide. Petals not seen. Stamens unequal in size, those opposite the anterior-lateral sepals and posterior-lateral petals with the longest filaments, anthers of those opposite the lateral sepals not seen, other anthers all glabrous. Anterior style ca. 2.6 mm long, shorter than the posterior two, glabrous, erect; apex ca. 1.3 mm long, each foliole ca. 1.2 mm long, ca. 0.8 mm wide, triangular. Posterior styles ca. 3 mm long, glabrous, slightly lyrate; each foliole ca. 1.3 mm long, ca. 0.6 mm wide, parabolic. Dorsal wing of samara encircling the nut, 2.6 cm high measured from base of nut, 1.4 cm wide; nut ca. 13 mm high, ca. 10 mm in diameter, smooth, locule embedded in spongy tissue, areole ca. 3.5 mm long, ca. 4 mm wide, concave, carpophore up to 5 mm long. Embryo not seen.

This distinctive species is known only from one incomplete specimen. It is easily recognized by its distinctive petiole glands and samaras. The cordate laminas are nearly glabrous, and the basal glands are peg-shaped and borne on the petiole, often obliquely, up to 3 mm below the lamina. In South America, such glands are found only in the Colombian *S. romeroi* Cuatrec.; they are also present in *S. sagraeanum* Adr. Juss. and *S. microphyllum* Griseb., and occasionally in *S. emarginatum* (Cav.) Adr. Juss., all of the West Indies. The flowers are borne on very short peduncles and pedicels, and are aggregated into umbellate clusters. The samara, similar to that of *S. adenodon* var. *adenodon* and *S. lacunosum* Adr. Juss., has the reduced dorsal wing surrounding the enlarged nut but lacks lateral winglets. In *S. adenodon* and *S. lacunosum,* as well as several other species, the nut is so large because the locule is surrounded by the air chambers, presumably an adaptation for dispersal by water; typically, the embryo is much larger than

that of species in which the samara is wind-dispersed. *Stigmaphyllon jobertii* differs in that the locule is surrounded by a thick layer of spongy tissue. The type includes two samaras, but in each the embryo was destroyed by insects.

The species is named for Clemens Jobert, who collected the type while accompanying C. A. W. Schwacke on an expedition to the Amazon Basin (Urban 1906).

Stigmaphyllon stenophyllum C. Anderson, sp. nov.—TYPE: COLOMBIA. Antioquia: Mpio. Medellín, Correg. Sta. Elena, Km 1 sobre la via Medellín-Ríonegro, 2000 m, 20 July 1986, *Callejas 2151* (holotype: MICH!; isotype: NY!).
Fig. 6.

Liana. Laminae 9–11.5 cm longae, 1.7–3 cm latae, anguste lanceolatae, supra glabrae, subtus pilos T-formes sparsos ferentes, margine eglanduloso. Inflorescentia solitaria vel dichasialis constata ex umbellis (pseudoracemis congestis?), floribus in quoque pseudoracemo ca. 15–20. Pedunculi 0.8–3 mm longi; pedicelli 10–15 mm longi. Petala margine digitiforme glanduloso-fimbriato; petala lateralia limbo orbiculari; petalum posticum limbo late elliptico. Stamina subaequalia, antheris glabris. Stylus anticus ca. 2.7 mm longus, apice ca. 0.8 mm longo, ca. 0.2 mm lato, lineari; styli postici ca. 2.7 mm longi, lyrati, apice ca. 0.9 mm longo, ca. 0.3 mm lato, lineari. Samara ignota.

Vine. Laminas 9–11.5 cm long, 1.7–3 cm wide, narrowly lanceolate, apex mucronate, base cordate, glabrous above, sparsely pubescent with T-shaped hairs below but densely so along the margins and on the midrib, margin eglandular, with a pair of prominent but sessile glands at apex of the petiole, each gland 0.6–0.7 mm in diameter; petioles 2–2.8 cm long; stipules ca. 0.5 mm long. Flowers ca. 15–20 per umbel (condensed pseudoracemes?), these borne solitary or in dichasia; peduncles 0.8–3 mm long; pedicels 10–15 mm long; peduncles 0.1–0.2 times as long as the pedicels; bracts 1.2–1.5 mm long, ca. 1 mm wide, triangular; bracteoles 1.5–1.7 mm long, 0.7–1 mm wide, narrowly triangular. Sepals ca. 2.5 mm long and wide, glands ca. 2 mm long, ca. 1 mm wide. All petals with the limbs glabrous, suffused with red, margin digitately glandular-fimbriate, the fimbriae up to 0.5 mm long; lateral petals with the limbs orbicular; anterior-lateral petals: claw ca. 3 mm long, limb ca. 8 mm long and wide; posterior-lateral petals: claw ca. 2.5 mm long, limb ca. 6.5 mm long and wide; posterior petal: claw ca. 3.2 mm long, apex very slightly indented, limb ca. 5 mm long and wide, broadly elliptical. Stamens equal in shape, unequal in size; anthers glabrous. Anterior style ca. 2.7 mm long, subequal to the posterior two, with scattered hairs in the proximal 1/2; apex ca. 0.8 mm long including a spur ca. 0.2 mm long, ca. 0.2 mm wide, linear, folioles absent. Posterior styles ca. 2.7 mm long, with scattered hairs in the proximal 1/2, erect; apex ca. 0.9 mm long including a spur ca. 0.2 mm long, ca. 0.3 mm wide, linear, slightly incurved, folioles absent. Samara not seen.

Stigmaphyllon stenophyllum is known only from the type collection. It is readily recognized by its short-petioled, narrowly lanceolate leaves up to 3 cm wide, which are sparsely beset with T-shaped hairs below though densely so on the midrib and margin. The peduncles are very short (0.8–3 mm) and only 0.1–0.2 times as long as the pedicels. In other respects, this species most closely resembles the sympatric *S. bogotense* Tr. & Pl., which differs in its long-petiolate leaves with elliptical to ovate to suborbicular laminas abundantly pubescent below, and longer peduncles and pedicels [peduncles 0.3–0.8 (–1) times as long as the pedicels]. In

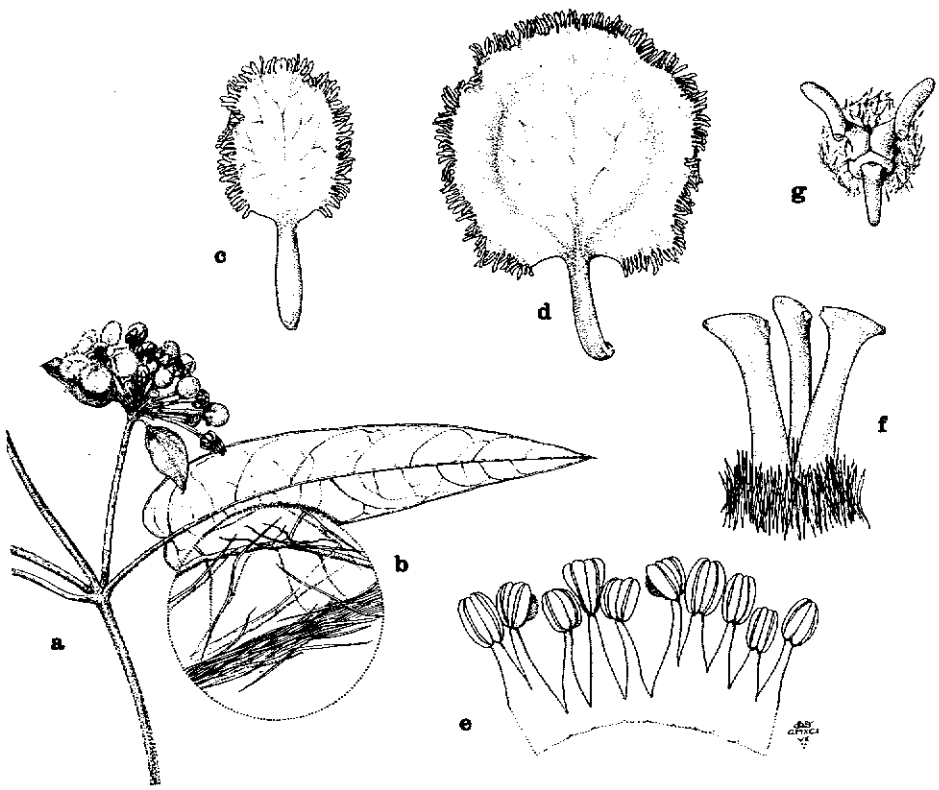

FIG. 6. *Stigmaphyllon stenophyllum.* a. Flowering branch (×0.5). b. Detail of abaxial leaf surface (×15). c. Posterior petal (×4). d. Anterior-lateral petal (×4). e. Androecium (×5); second stamen from right opposing posterior petal. f. Gynoecium (×10); anterior style at right. g. Gynoecium seen from above (×10); anterior style at bottom. (Based on *Callejas 2151.*)

both species, the flowers are arranged in umbels and condensed pseudoracemes, in which the basal two are separated a short distance from the cluster, the androecium is homogeneous—none of the anthers have enlarged connectives and reduced locules, and the styles are efoliolate.

ACKNOWLEDGMENTS

I thank William R. Anderson for his comments. Karin Douthit drew the handsome illustrations. I thank the curators of the following herbaria for making their collections of *Stigmaphyllon* available to me: A, AAU, AMAZ, C, DAV, E, GB, GH, K, MBM, MICH, MO, NY, P, R, RB, S, SEL, SP, UB, US.

LITERATURE CITED

Lasègue, A. 1845. *Musée botanique de M. Benjamin Delessert.* Paris: Fortin, Masson, et Cie.
Urban, I. 1906. Vitae itineraque collectorum botanicorum. In *Flora brasiliensis*, ed. I. Urban, 1: 1–268.