The identity of Stigmaphyllon dichotomum (L.) Griseb. (Malpighiaceae)

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Anderson, Christiane (University of Michigan Herbarium, North University Building, Ann Arbor, MI 48109-1057, U.S.A.). The identity of *Stigmaphyllon dichotomum* (L.) Griseb. (Malpighiaceae). Brittonia 45: 34–38. 1993.—The type of the Linnaean name *Banisteria dichotoma* was found to represent a species of *Stigmaphyllon* from northern South America known as *S. humboldtianum* (DC.) Adr. Juss. The correct name for this species is *Stigmaphyllon dichotomum* (L.) Griseb. The misapplications of the names *B. dichotoma* and *S. dichotomum* are reviewed. A full synonymy and description for *S. dichotomum* are provided, as well as a key to separate it from four other species of *Stigmaphyllon* with which it may be confused.

Key words: Malpighiaceae, *Stigmaphyllon,* South America, nomenclature.

Linnaeus's name *Banisteria dichotoma* has long been a source of confusion for botanists concerned with the wing-fruited genera of New World Malpighiaceae. I recently examined the holotype and found it to represent a species of *Stigmaphyllon* of northern South America (extending into Darién, Panama), which has also been confused taxonomically with two species of Mexico and Central America (Anderson, 1987). The correct application of the name *Stigmaphyllon dichotomum* (L.) Griseb. and the circumscription of the species are here clarified.

When Linnaeus published the *Hortus Cliffortianus* in 1737, he listed three species in his genus *Bannisteria* (p. 169). In his *Species plantarum* (1753), he included them under *Banisteria,* where they are cited by the binomials *B. fulgens, B. brachiata,* and *B. dichotoma.* Linnaeus's *B. fulgens* (non *Stigmaphyllon fulgens* Adr. Juss., 1840) is now included in *Stigmaphyllon emarginatum* (Cav.) Adr. Juss. and his *B. brachiata* in *Heteropterys* H. B. K. (W. R. Anderson, pers. comm.). The name *B. dichotoma* is not so readily assigned. The brief description is not informative, and the type is a very poor specimen consisting of an old fruiting sprig (no samaras now remaining) with four small leaves.

Students of the Malpighiaceae and in particular of the genera *Banisteriopsis* and *Stigmaphyllon* did not all have access to Linnaeus's type of *B. dichotoma* and mistakenly assigned the name to representatives of various species. De Candolle (1824) followed Cavanilles (1790), who listed Linnaeus's name as a synonym for his superfluous *Banisteria convolvulifolia* (=*Stigmaphyllon convolvulifolium* Adr. Juss.), a species of the Guianas and northeastern Brazil. Grisebach (1839) made the combination in *Stigmaphyllon.* He applied the name to a Sello collection (B, destroyed) from Rio de Janeiro, Brazil, but also cited Cavanilles's *Banisteria convolvulifolia* in synonymy. Unlike Cavanilles, de Candolle, and Grisebach, Jussieu did see the type of *B. dichotoma,* and in the treatment of his species *Stigmaphyllon convolvulifolium* in the *Monographie* (1843, p. 382) he excluded *B. dichotoma* L. He noted that Linnaeus's type differs from specimens to which he and others assigned the epithet "convolvulifolium." The leaves of the type are abundantly covered with T-shaped hairs below, as noted by Linnaeus, whereas the abaxial leaf surfaces of *S. convolvulifolium*

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are so finely and sparsely beset with minute appressed hairs that they appear glabrous. Although recognizing the type to belong to *Stigmaphyllon,* Jussieu apparently found it too poor to permit him to place it in a species. He had also seen the Sello collection at B that Grisebach cited, but noted that it was a specimen of *S. rotundifolium* Adr. Juss., a species of eastern Brazil. Niedenzu, who treated the Malpighiaceae for *Das Pflanzenreich* (1928), also did not see the original specimen and listed Linnaeus's *Banisteria dichotoma* in a section "Species e genere excludendae" appended to the treatment of the genus *Banisteria* L. (=*Banisteriopsis* Robinson in Small) as "*Stigmaphyllon* aut *Lalandianum* Juss. aut *convolvulifolium* (Cav.) Juss." (p. 456). He agreed with Jussieu that *S. dichotomum* sensu Grisebach was *S. rotundifolium* (p. 518).

During a recent visit at BM, where the Clifford Herbarium is now housed, I studied the holotype of *Banisteria dichotoma* and found that it represents the species known as *Stigmaphyllon humboldtianum* (DC.) Adr. Juss. The leaves with their distinctive pubescence, the large folioles of a few retained styles, and the single remaining glabrous stamen (lowermost umbel) are sufficient for a determination. Therefore, Grisebach's combination *Stigmaphyllon dichotomum* is the correct name for this species. Unfortunately, none of the samaras that Jussieu saw are now part of the type. In this species, and the very different *S. ciliatum* (Lam.) Adr. Juss., the embryos are laterally flattened, instead of ovoid as in the rest of the genus.

The range of *S. dichotomum* extends from northwestern Venezuela and northern Colombia into Darién, Panama. As has been noted elsewhere (Anderson, 1987), this species has been confused with two mostly Mexican and Central American species, *S. lindenianum* Adr. Juss. and, especially, *S. retusum* Griseb. Various authors, particularly of floristic treatments, have used the names *S. humboldtianum* and *S. tiliifolium* (H.B.K.) Nied., both synonyms of *S. dichotomum,* for these two species (e.g., Hemsley, 1879; Niedenzu, 1900, 1912, 1928; Small, 1910; Morton, 1936; Standley, 1937–1938; Standley & Steyermark, 1946; Cuatrecasas & Croat, 1981). Macbride (1949) listed *S. tiliifolium* in the Flora of Peru and cited a number of collections; however, none are *S. dichotomum,* which does not occur in Peru. *Stigmaphyllon dichotomum* might also be confused with the sympatric *S. singulare* C. Anderson and *S. columbicum* Nied., whose leaves also bear T-shaped hairs below. The five species may be separated with the following key:

1 Laminas sericeous below (the trabecula sessile); Atlantic lowlands from southern Veracruz, Mexico, to Panama, in Costa Rica also recorded from the Osa Peninsula, in Panama also in the Pacific lowlands, in Colombia known only from Chocó ..... *S. lindenianum* Adr. Juss.

1 Laminas pubescent below with T-shaped hairs (the trabecula borne on a stalk).

2 Sepals deciduous; each bracteole bearing a pair of conspicuous glands 0.5–0.6 mm in diam.; Sierra Perijá of Venezuela and Colombia ..... *S. singulare* C. Anderson

2 Sepals persistent; each bracteole eglandular or bearing 1 or 2 inconspicuous glands ca. 0.2 mm in diam.

3 Anterior style without folioles, the apex extended into a claw; northern and central Colombia, 2 collections from Costa Rica (San José), one from Ecuador (Napo) ..... *S. columbicum* Nied.

3 Anterior style foliolate.

4 Anthers pubescent; embryos ovoid; southeastern Mexico to Nicaragua ..... *S. retusum* Griseb.

4 Anthers glabrous; embryos laterally flattened; southern Panama (Darién), northern Colombia, and northwestern Venezuela ..... *S. dichotomum* (L.) Griseb.

The full synonymy for *S. dichotomum* and a detailed description are presented below. For illustrations of *S. dichotomum, S. lindenianum,* and *S. retusum,* see figures 5 and 6 in Anderson (1987; *S. dichotomum* is there called *S. humboldtianum*).

STIGMAPHYLLON DICHOTOMUM (L.) Griseb.

Banisteria dichotoma L., Sp. pl. 1: 427. 1753. *Banisteria convolvulifolia* Cav., Diss. 9: 428, t. 256. 1790, nom. superfl., non *Stigmaphyllon convolvulifolium* Adr. Juss., 1840. *Stigmaphyllon dichotomum* (L.) Griseb., Linnaea 13: 207. 1839. TYPE: specimen in the Clifford herbarium (HOLOTYPE: BM!, microfiche: MICH!, photos: MICH!, P!).

Banisteria tiliaefolia H. B. K., Nov. gen. sp. 5: 162.

1821 [1822], non *Banisteria tiliaefolia* Vent., 1808. *Banisteria humboldtiana* DC., Prodr. 1: 588. 1824. *Stigmaphyllon humboldtianum* (DC.) Adr. Juss. in St.-Hil., Fl. Bras. merid. 3: 56. 1832 [1833]. *Stigmaphyllon tiliifolium* (H. B. K.) Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 16. 1900. *Stigmaphyllon tiliifolium* var. α *typicum* Nied., Pflanzenreich IV. 141(2): 497. 1928. TYPE: COLOMBIA. Bolívar: ". . .inter Carthagenam et Cerro de la Popa," *Humboldt & Bonpland s.n.* (HOLOTYPE: P-HBK!).

Banisteria variifolia DC., Prodr. 1: 588. 1824. *Stigmaphyllon tiliifolium* var. γ *berteroanum* Nied., Ind. Lect. Lyc. Brunsberg. p. aest. 1900: 17. 1900. TYPE: COLOMBIA. Magdalena: "Ad Sanctam-Martham," *Bertero s.n.* (HOLOTYPE: G-DC!, photos: F!, GH!, MICH!, NY!).

Banisteria varia Sprengel, Syst. veg. 2: 386. 1825. TYPE: COLOMBIA. "Ad fl. Magalen [Magdalena]," *Bertero s.n.* (HOLOTYPE: B, destroyed).

Vine to 8 m. Laminas 6.2–23 cm long, 4.5–24 cm wide, usually cordate to ovate, sometimes elliptical to suborbicular, or sometimes 3–5 lobed, apex mucronate, base cordate or sometimes truncate or briefly attenuate, glabrate to glabrous above, densely pubescent with T-shaped hairs to tomentose below (trabecula 0.6–1.3 mm long, wavy to crisped and curled, stalk 0.1–0.3 mm long), margin with irregularly spaced sessile glands and also with filiform glands up to 6 mm long; petioles 1.7–10 cm long, with a pair of prominent but sessile glands at the apex, each gland 1–2.8 mm in diam. *Flowers* 15–40 (50) per umbel, these borne in dichasia, compound dichasia, or thyrses (axes to the 6th order). Peduncles 3.5–9 mm long, 0.7–2.1 times as long as the pedicels; pedicels 4–11 mm long, terete; both densely sericeous (hairs subsessile). Bracts 0.5–1.3 mm long, 0.5–1 (1.2) mm wide, triangular, apex acute or acuminate; bracteoles 0.5–1.5 mm long, 0.5–1 mm wide, oblong to triangular, apex obtuse, eglandular or sometimes with one or two inconspicuous glands (each ca. 0.2 mm in diam.); bracts and bracteoles sericeous abaxially. Sepals 1.8–2.2 (2.5) mm long, (1.8) 2–2.3 mm wide, glands 1.7–2.2 mm long, 0.9–1.2 mm wide. Lateral petals with the limbs orbicular, glabrous, margin denticulate or denticulate-fimbriate, teeth/fimbriae up to 0.3 (0.4) mm long; anterior-lateral petals: claw (1.5) 1.7–2.2 mm long, limb 8–8.6 mm long, 7.5–8 mm wide; posterior-lateral petals: claw 0.8–1 mm long, limb ca. 7.5 mm long, ca. 6.5–7 mm wide; posterior petal: claw 2.8–3.2 mm long, apex indented, limb of posterior petal 6–6.5 mm long, 4–4.5 mm wide, elliptical to oblong, glabrous, margin with fimbriae up to 0.5 mm long. Stamens unequal, those opposite the posterior-lateral petals the largest, anthers of those opposite the lateral sepals with the connective enlarged and the locules reduced or sometimes with only one reduced locule; anthers all loculate, glabrous. Anterior style 2–2.7 mm long, shorter than the posterior two, terete, glabrous, erect; apex 1.2–1.5 mm long, each foliole 1.3–1.6 mm long, 1.4–2 mm wide, square to sometimes subrectangular. Posterior styles 2.7–3 mm long, terete, glabrous, lyrate; folioles 1.3–1.6 mm long, 1.4–2 mm wide, square to sometimes subrectangular. Dorsal wing of samara 3.7–4.5 cm long, 1.2–1.5 cm wide, upper margin with an obtuse or subacute tooth; nut bearing a pair of irregularly rectangular lateral winglets, these 4.7–5.5 mm long, 0.5–1.5 mm wide, or bearing spurs and/or crests or with only one or two lateral ridges; nut 4.5–6 mm high, 3.8–4.5 mm in diam., areole 2.8–3.5 mm long, 2.2–3.3 mm wide, concave, carpophore up to 4.5 mm long. Embryo 6–7.5 mm long, ca. 3 times as long as wide, laterally flattened, outer cotyledon 5.7–6.4 mm long, 3–3.5 mm wide, inner cotyledon 4.9–6.3 mm long, 2.7–3.3 mm wide, both straight.

Phenology: Collected in flower from September through March, in fruit from November through April.

Distribution: Southern Panama (Darién), northern Colombia, and northwestern Venezuela; in dry situations; sea level to 1275 m.

Representative specimens examined: PANAMA. **Darién**: trail between Pinogana and Yavisa, *Allen 267* (A, F, GH, MO); between Río Jesús and Sabado, *Hammel 1348* (MO); Río Jaqué valley, 7°27′N, 78°05′W, *Knapp & Mallet 3203* (MICH); Chepijana dist., Tucute, *Terry & Terry 1376* (F, GH, MO); Marranganti and vicinity, *Williams 987* (NY).

COLOMBIA. **Antioquia**: Mpio. San Carlos, rd to La Calera, 2.2 km S of Puerto Nare-San Carlos rd, just E of Narices, 06°10′N, 74°49′W, *Brant et al. 1727* (K, MICH); Mpio. San Carlos, Cañón del Río Claro, sector norte, *Cogollo 932* (MICH); valley of the Río Anorí, vic. Planta Providencia, 26 km S and 23 km W (air) of Zaragoza, 07°13′N, 75°03′W, *Denslow 2537* (WIS),

2539 (MO, WIS). **Atlántico**: Usiacurí, arroyo del Higuerón, *Dugand & García Barriga 2306* (COL, US); entre Baranoa y Polonuevo, *Dugand & Jaramillo 2819* (COL, US); alrededores de Tubará, *Dugand & Jaramillo 4065* (COL, US). **Bolívar**: Mpio. Santa Catalina, Loma Las Puas, vía Arroyo Grande a Las Canoas, *Cuadros V. 3287* (MO); San Martín de Loba, lands of Loba, *Curran 53* (GH, US); Mpio. Cartagena, Caserio Las Canoas, 10°08′N, 75°24′W, *Marulanda 801* (MO). **Cundinamarca**: Mpio. Caparrapí, estación de ferrocarril Dindal, *García Barriga 7657* (COL, US); Quebrada Carmargo, N of Apulo, *Killip et al. 33211* (COL, US). **Magdalena**: S of Santa Marta, *Killip & Smith 21095* (GH, NY, US); Mpio. Ciénaga, carretera de Ciénaga a Fundación, *Romero Castañeda 8228* (COL, MO); entre Tucurinca y Fundación, *Romero Castañeda 9188* (COL, NY); Santa Marta, *H. H. Smith 1525* (A, BM, BR, C, CM, COL, F, G, GH, LL, MO, MT, NY, P, S, TEX, U, US, W, WIS). **Norte de Santander**: between Chinácota and La Esmeralda, *Killip & Smith 20918* (NY). **Santander**: orillas del Río Chicamocha, *Araque M. & Barkley 18S265* (MO, US); vicinity of Barrancabermeja, between Sogamoso and Carare rivers, *Haught 2089* (COL, S, US); between Nariño and El Tambor, *Killip & Smith 14956* (GH, NY, US); upper Río Lebrija Valley, NW of Bucaramanga, *Killip & Smith 16325* (NY, US). **Tolima**: Honda, *Pennell 3591* (GH, NY, US); Flandes, *Schneider 222* (COL); valle del Alto Magdalena, Guamo, Quebrada Serrezuela, *Uribe U. 4309* (COL, F, NY).

VENEZUELA. **Apure**: Reserva Forestal San Camilo, along Río Uribante between Río Nulita and Jordan, *Steyermark et al. 101761* (MY, VEN). **Barinas**: Dtto. Pedraza, trail from Pozo Negro (ca. 08°32′N, 70°37′W) to Mesa de Canagua (ca. 08°34′N, 70°40′W), *Dorr 7777* (MICH); Reserva Forestal de Caparo, Unidad Uno, *Jiménez Saa 1310* (NY, US); Dtto. Barinas, 10 km de Barinas hacia Corozo (08°30′N, 70°40′W), *Rutkis 376* (MICH, VEN). **Carabobo**: between Morón and El Palito, *Alston 6090* (F, NY, P, U, US); Guaremales, cerca de Urama, *Pittier 13065* (G, M, MO, NY, US, VEN). **Falcón**: Dtto. Silva, NE de La Soledad, entre La Soledad y Sanare, 10°52′N, 68°21′E, *Steyermark & Manara 100996* (MO, VEN); Dtto. Mauroa, Santo Domingo, en la vía desde hato Uverito hasta Cerro Socopo, *Flora Falcón 502* (MICH); Dtto. Silva, Reserva Forestal Río Toyuro, 9 km SSW de Riecito, *Wingfield & Smith 7961* (MICH). **Lara**: cerca de Santa Rosa, *Pittier 13090* (NY, US, VEN); entre Carora y Trentino, *Saer 718* (F, VEN); El Altas, La Miel, *R. F. Smith V1270* (VEN). **Mérida**: Dtto. Campo Elías, camino Estánquez-Páramo de Las Coloradas, *Quintero & Ricardi 1659* (MER). **Portuguesa**: Dtto. Turén, Mpio. Sta. Rosalia, La Caripucha, *Aristeguieta 1524* (VEN); Dtto. Guanare, carretera Guanare-Buscucuy, 15 km SW de Guanare, *Aymard & Cuello 3355* (MICH); en las orillas del Río Guanare, *Pittier 12054* (G, LE, M, NY, US, VEN). **Sucre**: La Gloria, carretera Canchinchi-El Rincón, *Marcano B. & Bautista 1347* (MICH). **Táchira**: 4 km S of San Cristóbal along San Cristóbal-Barinas rd, *de Bruijn 1356* (MICH, S, US, WAG); at El Vado, along Río Lobatera, in Parcelamiento to Guarumito, 5.5 km W of La Fria (by air, 18 km by road), 08°12′N, 72°18′W, *Steyermark et al. 120332* (MO). **Trujillo**: subida del puente de Motatan a Carvajal, cerca de Valera, *Pittier 10759* (G, GH, NY, US, VEN). **Yaracuy**: Dtto. Urachiche, 20 km al N de Urachiche, 69°10′N, 10°08′W, *Aymard et al. 1616* (NY); Hacienda Iboa cerca de San Pablo, *Pittier 12606* (F, G, M, MO, NY, US, VEN); Finca Los Apamates, asentiamiento La Llanada, entre Urama y San Felipe, *T. Romero 457* (MY). **Zulia**: Dtto. Miranda, vía El Consejo-Quirós-El Pensado, ca. 5 km W de El Pensado, *Bunting 8657* (MICH); Dtto. Bolívar, entre Las Tres Marías (área 8 km E de El Pensado, 10°25′N, 70°55′W) y el Río Chiquito, *Bunting 8993* (MICH); Dtto. Lagunillas, cuenca del Embalse Burro Negro (Pueblo Viejo), a lo largo del Río Grande, ca. 13 km N del Embalse, 10°25′N, 70°49′W, *Bunting 11254* (MICH, NY); Dtto. Mana, cuenca del Río Guasare, alrededores del Destacamento Guasare No. 1 (La Yolanda), 10°52′N, 71°29′W, *Bunting 12883* (MICH); between Represa Socoi and Campo Carichuano, NW of Maracaibo, *Fryxell et al. 4400* (MICH); Perijá, *Gines 2096* (US).

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