

AN INVESTIGATION OF *MICONIA TETRANDRA* (MELASTOMATACEAE: MICONIEAE): PHYLOGENETIC PLACEMENT AND TAXONOMY

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ABSTRACT

Miconia tetrandra, a morphologically distinctive species restricted to the Caribbean region, is provided with an updated assessment of its phylogenetic position and taxonomy. A detailed description and nomenclatural treatment are provided, along with a consideration of phenology, distribution and habitat, and citation of specimens examined. The species is a member of the Caribbean clade, and it is unusual within *Miconia* in having flowers with only four stamens (alternating with the petals), with short, obovate, yellow anthers that each open by two large pores. *Miconia tetrandra* is morphologically quite divergent from, but is likely related to, a clade comprised by *M. angustifolia*, *M. urbanii*, and *M. biflora*, and these three species traditionally have been included within the genus *Tetrazygia*. In contrast, *M. tetrandra* usually has been placed within *Miconia*.

RESUMEN

Miconia tetrandra, una especie morfológicamente diferenciada, restringida a la región del Caribe, recibe una evaluación actualizada de su posición filogenética y taxonómica. Se proporciona una descripción detallada y tratamiento nomenclatural, junto con consideraciones de su fenología, distribución y hábitat, y cita de especímenes examinados. La especie es miembro del clado del Caribe, y es inusual dentro de *Miconia* por tener flores con solo cuatro estambres (alternando con los pétalos), con anteras cortas, obovadas y amarillas que se abren cada una por dos grandes poros. *Miconia tetrandra* difiere morfológicamente de las especies del clado: *M. angustifolia*, *M. urbanii* y *M. biflora*, pero probablemente esté relacionado con él. Estas tres especies se han incluido tradicionalmente en el género *Tetrazygia*. Por el contrario, *M. tetrandra* generalmente se ha ubicado en el género *Miconia*.

We have long been aware of the phenetically distinctive species *Miconia tetrandra* (Sw.) D. Don ex G. Don through our collecting and systematic work on the Melastomataceae of the Caribbean region. Although long placed in *Miconia* Ruiz & Pav. (Don 1830) and traditionally considered within sect. *Cremanium* (D. Don) Triana ex Hook. f. (Triana 1872; Cogniaux 1891; Goldenberg et al. 2013) because of its obovate, large-pored anthers, its precise phylogenetic relationships have been problematic because of several unusual morphological features, i.e., its arborescent habit, the flowers with only four stamens, these radially spreading and alternating with the petals, and the yellow, obovate anthers, each with two gaping pores (Fig. 1). The species is restricted to the Greater Antilles (Cuba, Hispaniola, Jamaica, and Puerto Rico) and Lesser Antilles (Dominica, Grenada, and Guadeloupe). The aim of this paper is to clarify its phylogenetic relationships, taxonomic circumscription, and to provide a detailed taxonomic treatment of this unusual Caribbean species.

Recent DNA-based phylogenetic analyses (Goldenberg et al. 2008; Gavrutenko et al. 2020; Michelangeli et al. 2008; Majure et al. 2013; and Majure, unpublished) clearly place *Miconia tetrandra* within the Caribbean clade (as designated in Goldenberg et al. 2008; Michelangeli et al. 2008), one of the major radiations of *Miconia* (Miconieae) within the Caribbean region (Judd 2019; Judd & Majure 2019, 2021; Majure et al. 2014, 2015, 2016, 2018; Michelangeli et al. 2008). The clade is morphologically diverse, nearly restricted to the Caribbean (only *Miconia bicolor* (Mill.) Triana and *Miconia lundelliana* L.O. Williams occur in continental regions), and it contains species traditionally placed within *Calycogonium* DC., *Pachyanthus* A. Rich., *Tetrazygia* Rich. ex DC., *Charianthus* D. Don, which were traditionally considered to be restricted (or nearly restricted) to the Caribbean islands, as well as the more widespread *Clidemia* D. Don p.p., *Miconia* p.p., and *Ossaea* DC. p.p. Finally, in order to recognize a monophyletic *Miconia*, its circumscription recently has been expanded, and all genera of Miconieae are now included; for justification of this recircumscription see Ionta et al. (2012) and

Michelangeli et al. (2019, including papers cited therein). All members of the Caribbean clade are, therefore, now included within *Miconia*—those like *M. tetrandra*, which were traditionally placed in that genus, as well as those formerly within *Tetrazygia*, *Calycogonium*, *Pachyanthus*, etc.

Miconia tetrandra has stems with nodal lines, a putative morphological synapomorphy of the Caribbean clade (Majure et al. 2013), however, this feature is quite homoplasious, limiting its taxonomic utility. The clade cannot be easily diagnosed on the basis of morphology, although several of its subclades are morphologically distinctive—the *Pachyanthus* A. Rich. clade (Bécquer Granados 2012), the *Miconia crotonifolia* (Desr.) Judd & Ionta complex (Judd & Ionta 2013), *Miconia* sect. *Calycopteris* Judd, Bécquer & Majure (Judd et al. 2014a; Bécquer et al. 2017/18), *M.* sect. *Miconiastrum* (Bonpl. ex Naudin) Judd, Bécquer & Majure (Judd et al. 2014b), *M.* sect. *Echinatae* Judd, Bécquer & Majure (Judd et al., accepted), the *Miconia decorticans* (Bécquer) Bécquer & Majure clade (Majure et al. 2014), *M.* sect. *Krugiophytum* (Cogn.) Majure & Judd (Majure et al. 2014/15), the sandpaper clade (Majure et al. 2015), *M.* sect. *Lima* Majure & Judd (Majure et al. 2016), *M.* sect. *Calycomatonia* Skean, Judd, Majure & Bécquer (Majure et al. 2015, 2018), and the *Charianthus* D. Don clade (Penneys & Judd 2003, 2005, with exclusion of *Miconia fadyenii* (Hook.) Judd & Skean). *Miconia tetrandra* shows no putative morphological synapomorphies with any of these subclades within the Caribbean clade, and neither is it placed with any of these on the basis of molecular data (Gavrutenko et al. 2020). Likewise, *Miconia tetrandra* does not possess any of the morphological characters traditionally used to distinguish the non-monophyletic Caribbean genera *Calycogonium* (shoots usually producing only a single node before producing, usually few-flowered, terminal inflorescences, and the flowers 4-merous) or *Tetrazygia* (flowers with markedly constricted hypanthium; Judd & Skean 1991).

Miconia, prior to its recently expanded circumscription (see Michelangeli et al. 2019), was extremely artificial and polyphyletic (typical of traditional genera in Miconieae; see Cogniaux 1891, and compare with Goldenberg et al. 2008). It was defined solely on the basis of an array of shared plesiomorphic characters, e.g., obviously terminal, many-flowered paniculate cymes, with usually small to moderate-sized flowers, without nectar, having a cylindrical to variously conic, non-constructed hypanthium/calyx (which does not split longitudinally as the flower matures), calyx teeth $\pm$ inconspicuous, shorter than the lobes, a spreading to reflexed corolla with the petals uniform in texture, $\pm$ quickly deciduous, and with blunt to rounded apices, stamens with connective unappendaged, and with $\pm$ globose berries. A conspicuous calyptra (formed from connation of the calyx lobes and dehiscing circumscissily, as in many species of the *Conostegia* clade; Kriebel 2016) was lacking, although flowers with a membranous calyptra, opening irregularly, were present in a few species (e.g., sect. *Laceraria* (Naudin) Triana ex Hook. f.). Indumentum was (and still is) extremely variable within the genus, as traditionally circumscribed, but extremely bullabased hairs were usually absent (Wurdack 1986). Form of the anther, e.g., its shape, coloration, means and form of opening, was (and is) quite variable within *Miconia*, and such characters have been used to determine sectional circumscriptions (Goldenberg et al. 2008, 2013). Because *Miconia tetrandra* shows the above listed array of likely plesiomorphic characters, it has usually been placed within *Miconia*, and placed in sect. *Cremanium* because its anthers are more or less obovate with two large, gaping pores. We note however, that de Candolle (1828) placed the species within *Tetrazygia* because its flowers are 4-merous (a common condition within the “genus”, although many species traditionally placed in *Tetrazygia* have 5-merous flowers; see Judd et al. 2014b) and sometimes have flowers with a very slightly constricted hypanthium/calyx (long considered a defining generic character, but actually very homoplasious within Miconieae; see Majure et al. 2013). The non-monophyletic circumscription of *Miconia*, along with the lack of evident morphological synapomorphies of the Caribbean clade, led to a taxonomic placement of *M. tetrandra* (in *Miconia* sect. *Cremanium*) that obscured its close phylogenetic relationship with members of the Caribbean clade (traditionally placed in the Caribbean centered *Tetrazygia*, *Calycogonium*, *Charianthus*, or *Pachyanthus*, or the more widespread *Clidemia*, *Ossaea*, or *Miconia*, in various sections, but not sect. *Cremanium*). It should be added that the species of *Miconia* sect. *Cremanium* do not form a monophyletic group, although the majority belong in the *Miconia* III clade, along with the West Indian members of sect. *Chaenopleura* (Goldenberg et al. 2008; Judd 2007; Judd et al. 2015, 2017), and are thus phylogenetically quite distinct from the Caribbean clade.

Within the Caribbean clade, *Miconia tetrandra* is likely sister to a clade comprised of *M. angustifolia* (Sw.) Griseb. and *M. urbanii* (Cogn.) Judd, and probably also the morphologically similar *M. biflora* (Cogn.) Judd (which was not included in the analyses) (Gavrutenko et al. 2020; Majure, unpublished). These three species traditionally have been placed in the genus *Tetrazygia*, as their calyces/hypanthia are slightly to strongly constricted in fruit. They also have calyx teeth that are longer than the lobes, and each tooth is flattened parallel to the lobe with which it is associated; in addition, the calyx tube develops a longitudinal tear between each pair of lobes. *Miconia urbanii* and *M. biflora* are especially distinctive because of their flattened inflorescence axes and flowers with an elongate hypanthium, asymmetrical petals that are $\pm$ undulated on one side, and 4-lobed ovary. The hypothesized phylogenetic relationship of these three species with *M. tetrandra* has not previously been noted, although a clade comprised of *M. tetrandra* + *M. angustifolia* + *M. urbanii* is present in Gavrutenko et al. (2020). This clade is not well supported morphologically, although we note that these species are all 4-merous and have inflorescences with short pseudopedicels. Both characters are homoplasious: 4-merous flowers are common within the Caribbean clade, and elsewhere in *Miconia* as well (Majure et al. 2013), and short pseudopedicels also occur in *M. longicollis* (Urb. & Cogn.) Judd & Bécquer and relatives (Judd, unpublished). *Miconia tetrandra* also is phenetically quite distinct, when compared to these species, because it has only four (vs. eight) stamens, obovate (vs. elongate-ovate) stamens that open by two large pores (vs. a single small pore) (Fig. 1). Thus, *M. tetrandra* is easily distinguished from *M. angustifolia*, *M. urbanii*, and *M. biflora*, despite their close phylogenetic relationship (as hypothesized by DNA-sequence data). Therefore, we support placement of this morphologically distinctive species in its own section, and resurrect de Candolle's (1828) long ignored *Tetrazygia* sect. *Tetrastemon*, transferring it to *Miconia*. (The recognition sect. *Tetrastemon* does not create paraphyly problems among any other currently recognized sections within *Miconia*). A brief sectional description (comparable to others published for sections within the Caribbean clade), along with a taxonomic treatment for *M. tetrandra* follows.

TAXONOMIC TREATMENT

***Miconia* sect. *Tetrastemon* (DC.) Judd & Majure, **comb. nov.** *Tetrazygia* Rich. ex DC. sect. *Tetrastemon* DC. Prodr. 3:172. 1828. TYPE: *Miconia tetrandra* (Sw.) D. Don ex G. Don [= *Melastoma tetrandrum* Sw.; *Tetrazygia tetrandra* (Sw.) DC.]**

Evergreen shrub to medium-sized tree; young stems $\pm$ rectangular in cross section, indumentum of dense, matted, globular-stellate or stellate hairs. Leaves opposite and decussate, $\pm$ isophyllous, blade ovate to elliptic, rarely oblong, coriaceous, apex usually acuminate to attenuate, base obtuse to rounded or occasionally slightly cordate, margin entire to obscurely toothed; venation acrodromous, secondary veins 2 pairs, tertiary veins percurrent, oriented subperpendicular to midvein, indumentum of adaxial surface initially with dense to moderate globular-stellate to stellate hairs, but these $\pm$ quickly deciduous; abaxial surface with dense to moderate, $\pm$ ferrugineous, globular-stellate to stellate hairs, the epidermis visible and leaves appearing pale green. Inflorescences obviously terminal, many-flowered, paniculate cymes. Flowers perfect, 4-merous, actinomorphic, shortly pedicellate to sessile, with pseudopedicels of the 2 lateral flowers of dichasium very reduced (to apparently absent). Hypanthium $\pm$ cylindrical, not or only very slightly constricted above ovary, often slightly longitudinally ridged externally, the outer surface with dense globular-stellate to stellate hairs. Calyx lobes 4, shallowly triangular to nearly obsolete, with apex rounded to obtuse, the tube not tearing; calyx teeth shorter than the lobes, flattened-triangular and terminating in a short bump. Petals 4, obovate to ovate or oblong, slightly asymmetric, spreading to recurved, white, apex rounded, base narrowed, $\pm$ clawed, glabrous, margin entire. Stamens 4, geniculate near apex of filament; staminal filament glabrous, anther obovate, straight, short, opening by 2 broad, gaping pores (as wide as the anther), yellow at anthesis, connective glabrous, not expanded or appendaged. Ovary 4-locular, partially inferior, with a cylindrical collar encircling style, glabrous or with a few branched hairs apically, with axile placentation, the numerous ovules borne on an expanded placenta, style straight to curved, stigma truncate to punctate. Berries subglobose to globose or short-ovoid, blue-black. Seeds angular-obovoid, with flat raphe extending most of seed-length; testa smooth.

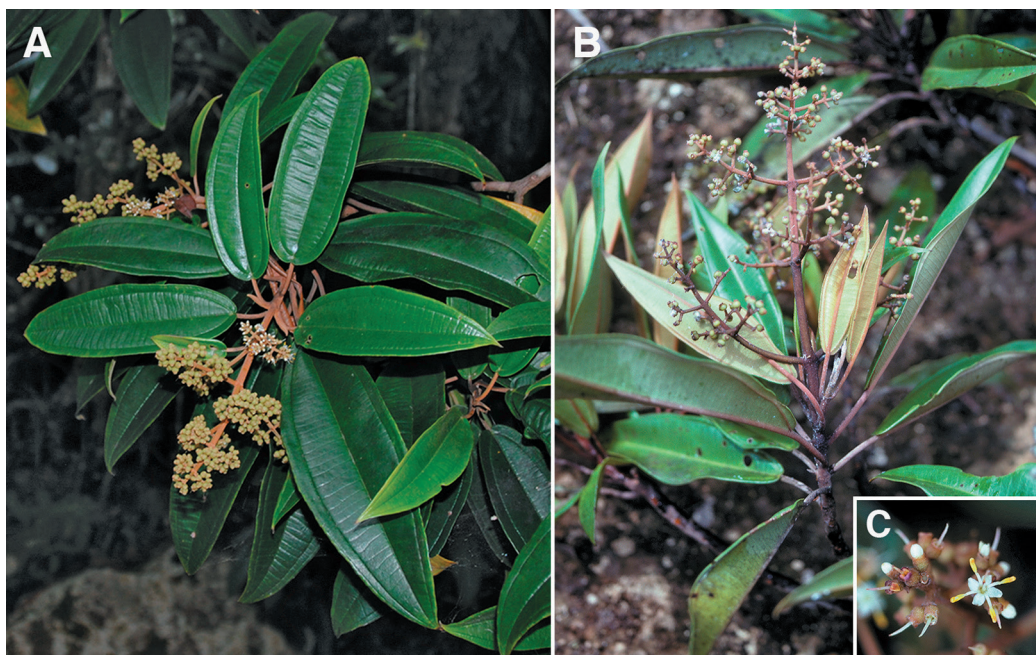


FIG. 1. Photographic plate of *Miconia tetrandra*. **A.** Lower branch showing terminal inflorescence/inflorescence and adaxial leaf surface (Majure 7884). **B.** Abaxial leaf surface and terminal inflorescence (Judd 5418). **C.** Four-merous flowers showing two-pored, obovate, yellow anthers (Judd 5418). Photo A by Majure; B & C by Judd.

Miconia tetrandra (Sw.) D. Don ex G. Don in J.C. Loudon, Hort. Brit. 174. 1830. *Melastoma tetrandrum* Sw., Prodr. 72. 1788. *Cremanium tetrandrum* (Sw.) Griseb., Fl. Brit. W.I. 262. 1860. *Tetrazygia tetrandra* (Sw.) DC., Prodr. 3:172. 1828. *Acinodendron tetrandrum* (Sw.) Kuntze, Revis. Gen. Pl. 2:953. 1891. TYPE: JAMAICA: without definite locality (fl), O. Swartz s.n. (LECTOTYPE, initially designated by Howard & Kellogg, 1986, followed here by a second-step lectotypification): S, internet image! S-R-3485; ISOLECTOTYPES: BM, internet image! 001008090; C, internet image! 10014870; S, internet image! S-R-3484; SBT, internet image! 12607).

Melastoma farinulentum Sw. ex Wikstr., Kongl. Vetensk. Akad. Handl. 1827:65. 1827. TYPE: GUADELOUPE: 1827, Forsström s.n. (HOLOTYPE: S, internet image! 16-2405; photo of holotype: A!).

Miconia abeggii Urb. & Ekman, Ark. Bot. 22A (17):35. 1929. TYPE: HAITI: Massif du Nord, Port Margot, Morne Maleuvre, 800–1000 m 8 Dec 1924 (sterile), E. L. Ekman H2790 (LECTOTYPE, designated here: S! 04-414).

Shrub or tree to 20 m tall, with $\pm$ gray, vertically furrowed bark. Indumentum of multicellular, pale to dark ferrugineous, globular-stellate to stellate hairs. Young twigs 2–9 mm wide, rectangular, sometimes with a shallow longitudinal groove on the broader faces, becoming terete with age, with $\pm$ dense, globular-stellate to stellate hairs; internodes 0.6–7.5 cm long, nodal line present, clearly evident to $\pm$ obscure. Leaves opposite and decussate, isophyllous or nearly so, with petiole 7–73 mm long, with dense, globular-stellate to stellate hairs; blade 4.2–24 $\times$ 1.3–11 cm, 1.7–5 times longer than wide, ovate to elliptic (rarely oblong), coriaceous, apex acuminate to attenuate (or rarely acute), base acute to rounded or occasionally slightly cordate, margin plane to revolute, entire to occasionally obscurely toothed, the teeth (if present) to 0.2 mm, not associated with a multicellular, elongated, simple, eglandular hair; venation acrodromous, $\pm$ basal (but prominent pair of secondary veins diverging slightly above base), with prominent midvein and 2 pairs of secondary veins, 1 pair of secondary veins conspicuous and 1 pair inconspicuous, 2 conspicuous secondary veins positioned 1–17 mm from margin, and 2 inconspicuous secondary veins intramarginal to 3.5 mm from margin, tertiary veins percurrent, oriented subperpendicular to midvein, 1.5–11 mm apart, connected by quaternary veins, higher

order veins reticulate, $\pm$ obscure; the midvein and major secondary veins moderately to slightly impressed, tertiary veins $\pm$ flat, remaining veins flat on adaxial surface; the midvein conspicuously raised, major secondary veins slightly to moderately raised, minor secondary veins $\pm$ flat, tertiary veins very slightly raised to flat, and higher-order veins flat on abaxial surface; adaxial surface dark green (brownish green to brown when dried), indumentum of dense to moderate, globular-stellate hairs when young, but quickly $\pm$ glabrous, but with a few such hairs persisting on major veins and sometimes also on lamina; abaxial surface with dense to moderate, pale to dark ferrugineous, globular-stellate to stellate hairs, and these 0.05–0.15 mm across, and not obscuring the epidermis. Hair tuft domatia absent. Inflorescences terminal, with vegetative shoots producing numerous nodes before becoming reproductive, paniculate cyme, 3–19 cm long, 3–12 cm across, with 4–9 major branch pairs, these square to rectangular in cross-section; proximal segment of lowermost inflorescence branches 5–60 mm long, with dense, globular-stellate to stellate hairs, the ultimate axes (pseudopedicels) very reduced to $\pm$ absent, and flowers congested (in 3-flowered glomerules) or $\pm$ slightly separated; peduncle 1–6.8 cm long, with similar indumentum; bracts 0.5–27 (–50) $\times$ 0.2–6 (–8) mm, not involucrate, sometimes intergrading with leaves, triangular or narrowly triangular to linear, with acute apex, usually deciduous along primary inflorescence axis, but otherwise $\pm$ persistent, with stellate to globular-stellate hairs; bracteoles 0.2–0.5 $\times$ 0.15–0.2 mm, triangular to linear, with acute apex, deciduous to persistent, with stellate to globular-stellate hairs. Flowers 4-merous, radial, with pedicel 0–1.2 mm long. Hypanthium 1.1–2 mm long, $\pm$ cylindrical, unlobed, often longitudinally ridged externally, not to only very slightly constricted above ovary; the free portion 0.55–0.85 mm long, 0.85–1.5 mm wide at the torus, the outer surface with dense stellate to globular-stellate hairs, the inner surface smooth, glabrous; androecial fringe absent. Calyx lobes 4, separate in bud (i.e., non-calyptate), the tube 0.06–0.26 mm long, not tearing between lobes, the lobes 0.06–0.55 $\times$ 0.5–1.2 mm, shallowly triangular to nearly obsolete, the apex acute to obtuse, abaxially with hairs similar to those of the hypanthium, and adaxially with a few branched to globular hairs; calyx teeth present, 0.15–0.5 mm long, flattened-triangular, terminating in a short bump, with stellate to globular-stellate hairs. Petals 4, 1.2–2.2 $\times$ 0.8–1.5 mm, ovate to obovate or oblong, $\pm$ spreading, white, glabrous, the apex rounded, often with a shallow notch, the base narrowed, and $\pm$ clawed, the margin entire. Stamens 4, alternating with petals, geniculate near apex of filament; staminal filament 1.3–2.2 mm long, glabrous, white, anther 1.1–1.5 $\times$ 0.3–0.6 mm, $\pm$ obovate, straight, yellow, opening by 2 broad, gaping pores (together as wide as the anther or nearly so), with proximal portion of the anther sacs reduced, sterile, connective not prolonged below thecae, and not appendaged, glabrous. Ovary 4-locular, 0.8–1.4 mm long, 1.2–1.5 mm across, 2/3- to 4/5-inferior, apically $\pm$ conic, glabrous or with a few branched hairs, the apex with a cylindrical and apically lobed collar (encircling style), ovary apex without longitudinal ridges, and lacking crown, with axile placentation, the ovules numerous, borne on expanded placenta that extends into each locule; style 1.5–3.8 mm long, terete, not swollen, straight to curved, white, glabrous; stigma truncate to punctate, minutely papillose, ca. 0.1–0.15 mm wide. Berries 2.5–5.5 mm long (including inconspicuous calyx), 2.5–7 mm in diameter, subglobose or short-ovoid to $\pm$ globose, blue-black, with sparse to moderate globular-stellate hairs, the hypanthium not constricted above ovary. Seeds 0.9–1.7 mm long, angular obovoid, with flat, $\pm$ narrowly triangular to rectangular raphe, testa $\pm$ smooth; appendage absent. (Fig. 1.)

Distribution and ecology.—*Miconia tetrandra* is widespread in the Caribbean region, occurring on eastern Cuba, Hispaniola (Haiti and the Dominican Republic), Jamaica, Puerto Rico, Guadeloupe, Dominica, and Grenada. On Cuba *M. tetrandra* is restricted to the mountains of the northern Oriente region, while on Hispaniola the species grows in the Cordillera Septentrional, Massif du Nord/Cordillera Central, and the Massif de la Hotte. In Jamaica it grows in the Blue Mountains and John Crow Mountains, while in Puerto Rico it is widespread, occurring in the Sierra de Luquillo, Sierra de Cayey, and the Cordillera Central. The species grows in cloud forests, moist, broadleaved, montane forests, and moist forests of *Pinus occidentalis* Sw., from 100–1380 m.

Phenology.—Flowering specimens have been collected from January through June, and also in December.

Iconography.—An illustration of *Miconia tetrandra* was published in Little et al. (1974). An unpublished

watercolor illustration of the species, under the name *Acinodendron tetrandrum*, is available online (Britton & Home, Popular Flora of Puerto Rico, Flora Borinqueña, t. 426; accessed online: www.plantillustrations.org).

Additional specimens examined. **CUBA. Prov. Guantánamo:** in Cuba Orientali, precise locality unknown, 1856–1857, *Wright 186* (MO); Monte Verde, Jan–Jul 1959, *Wright 1227* (MO, NY). **Prov. Holguín:** Sierra de Nipe, Mpio. Mayarí, Alto de la Torre, 732 m, 19 May 2004, *Béquer et al. 82488* (FLAS); Mayarí, S of Sierra de Cristal, 28 Dec 1955, *Alain & López Figueiras 4719* (GH); Sierra de Nipe, at the foot of Loma Mensura, 450 m, 12 Jul 1919, *Ekman 9743* (NY, US); Sierra de Nipe, Loma Mensura, 725 m, 15 Oct 1919, *Ekman 9910* (NY); Mayarí, S slopes of El Cristal, 2–7 Apr 1956, *Alain et al. 5516* (GH). **DOMINICA.** in sylvis ad La Sois, Apr 1882, *Eggers 749* (MO, mounted and accessioned photocopy); coastal rd between Calibishie and Woodford Hill Estate, 5 Jun 1964, *Ernst 1558* (GH, US); midway along rd between Pointe Ronde and Milton Estate, 350 m, 10 Apr 1940, *Hodge & Hodge 2671* (GH); La Chaudière, valley of Hampstead River, ca. 2 mi from mouth, 100 m, 10–14 May 1940, *Hodge & Hodge 3522* (GH); along rd from Pont Casse to Castie Bruce, 15°22.91'N, 61°20.40'W, 590 m, 29 May 2000, *Pennys 1300* (FLAS, NY, US). **DOMINICAN REPUBLIC. Prov. Azua:** Las Lagunas, 800 m, 17 Jun 1926, *Ekman H6407* (GH, NY, US). **Prov. Duarte:** Cordillera Septentrional, Loma Quita Espuela, subiendo por Los Bracitos hasta el firme, 19°21'N, 70°9'W, 300–800 m, 6 May 1993, *Bastardo et al. 38* (MO); Cordillera Septentrional, Reserva Científica Loma Quita Espuela, El Valle, en las Márgenes del Río El Valle, 19°22'N, 70°09'N, 550 m, 13 Aug 1992, *García et al. 5144* (FLAS, JBSD); Cordillera Septentrional, Mpio. San Francisco de Macoris, Loma Quita Espuela, 19.35029°N, 70.14893°W, 750 m, 12 Feb 2016, *Majure & Clase 6055* (FLAS, JBSD, NY); Cordillera Septentrional, San Francisco de Macoris, Reserva Científica Loma Quita Espuela, en la entrada a la Loma La Canela, 19°24'44"N, 70°09'57"W, 600 m, 21 Nov 2002, *Veloz & Monegro 2914* (FLAS, JBSD). **Prov. Peravia-Prov. San Cristobal border:** Mahoma, 12 km NE de Rancho Arriba (en la carretera a Piedra Blanca) y 4 km S hasta Mahoma y Río Mahoma, 18°43.5'N, 70°22'W, 800 m, 12 Aug 1982, *Zanoni et al. 22506* (JBSD, MO, NY, US). **Prov. de San Juan:** Cordillera Central, Parque Nacional José del Carmen Ramírez, 14 km al N del poblado Arroyo Cano en el lugar llamado “Los Frios”, 400 m al E de la caseta de la Dirección Nacional de Parques, 18°53'N, 71°03'W, 1380 m, 1 May 1986, *García & Pimentel 1295* (FLAS, JBSD); Cordillera Central, near Los Frios along jeep rd from Arroyo Cano, just below “Forestry House” in Parque Nacional José del Carmen Ramírez, 1250 m, 2 Jun 1992, *Judd & Skean 6701* (FLAS, JBSD); Cordillera Central, Jose del Carmen Ramirez National Park, above “Los Frios,” on jeep rd from Arroyo Cano (N of Guanito), trail from forest house to Arroyo Palo de Quello, 1250 m, 2 Jun 1992, *Skean & Judd 3275* (JBSD, MSC). **Prov. San José de Ocoa:** Cordillera Central, Municipio Rancho Arriba, Sección Mahoma, Comunidad Florencio, orillas del Río Florencio; 18.70046°N, 70.35976°W, 916 m, 17 May 2019, *Majure 7888* (FLAS, JBSD). **Prov. Santiago:** Cordillera Central, Mpio. San José de las Matas, sección, Mata Grande, Parque Nacional Armando Bermúdez, en la Loma de la Barranca, 1370 m, 20 Mar 1999, *Clase & Peguero 871* (FLAS, JBSD); Cordillera Central, Mpio. San José de las Matas, en la carretera que va desde Diferencia a Los Ramones, 5 km antes de llegar a Los Ramones, Parque A. Bermúdez, 475 m, 18 Jun 1999, *Clase & Peguero 1337* (FLAS, JBSD); Cordillera Central, Mpio. San José de las Matas, Los Ramones, trillo La Hispaniola, 19°34'N, 70°05'W, 200–280 m, 10 Oct 2002, *Clase et al. 3438* (FLAS, JBSD); Cordillera Central, 16–17 km al SO de Pedregal de San José de las Matas, en Mata Grande en las márgenes del Río Sape Malo al NO de la caseta de la Dirección Nacional de Parques, 19°14'N, 70°58'W, 28 Jun 1988, *Pimentel & Cabral 1086* (FLAS, JBSD); Cordillera Central, en el poblado rural “Palacio”, aprox. 2–3 km de La Manacla en el camino a Los Ramones, 19°15'N, 71°09'W, 740–760 m, 24 May 1988, *Zanoni et al. 41155* (JBSD, MO, NY, US). **Prov. Santiago Rodriguez:** Cordillera Central, Monción, Lagunas de Cenobi, ca. 1100 m, 15 Jun 1929, *Ekman H12868* (US); Cordillera Central, along rd between La Leonor and El Aguacate, 3 km W of La Leonor, 600 m, 30 May 1992, *Judd et al. 6671* (FLAS, JBSD). **GRENADE:** Grand Etang, 31 Mar 1897, *Broadway s.n.* (MO, specimen at F without indication of collector); Grand Etang, Mar 1937, *Broadway 7897* (NY); ad Grand Etang, Dec 1889, *Eggers 6403* (US); near Grand Etang, 4–10 Mar 1979, *Howard & Howard 18822* (A, NY); vicinity of Grand Etang, 1600–1800 ft, 30 Oct–11 Dec 1957, *Proctor 16991* (A). **GADELOUPE:** Gourbeyre, Morne Gabelin, 300–600 m, 1894, *Duss 3469* (F, MO, MO [as “3649” perhaps transposed numerals], NY, US); St. Rose, 28 Apr 1938, *Questel 848* (US); Goyave, 20 m, 4 May 1938, *Questel 2353* (US). **HAITI. Dept. du Nord-Est:** Massif du Nord, Mont-Organisé, 650 m, 1 Jun 1926, *Ekman H6243* (US); Vallière, top of Morne Salnave, 1125 m, 1 May 1928, *Ekman H9934* (US). **Dept. du Sud:** Massif de la Hotte, western group, Tiburon, Morne Sentier, 750 m, 26 Aug 1928, *Ekman H10585* (NY). **JAMAICA. Portland Parish:** near Portland-St. Andrew border, W slope of Silver Hill, 4300–4500 ft, 25 Jul 1966, *Anderson & Sternberg 3258* (DUKE, GH, MICH, US); Vinegar Hill, 4300 ft, 25 Jun 1896, *Harris 6408* (F, NY); Blue Mountains, Hardwar Gap, along “Shelter trail,” ca. 1200 m, 21 May 1987, *Judd 5418* (DUKE, F, FLAS, GH, IJ, MO, NY); near St. Andrew Parish border, Blue Mountains, Hardwar Gap, along “Shelter Trail,” ca. 1200 m, 24 May 1987, *Judd 5470* (FLAS, IJ, MO); Blue Mts., Trafalgar, 9 May 1916, *Perkins 1186* (A, GH); E slope of the John Crow Mts., 1.5–2 mi SW of Ecclesdown, 1500–2000 ft, 14 Jan 1955, *Proctor 9811* (A, NY, US); NW slope of Joe Hill, 1000–2250 ft, 20 Apr 1955, *Proctor 10092* (A, NY, US); along trail to waterfall N of Hardwar Gap, 3800–4000 ft, 8 May 1961, *Proctor 22270* (GH, MICH); Vinegar Hill, 1300 m, 9 Mar 1906, *Shreve s.n.* (NY). **St. Andrew Parish:** Blue Mountains, 1.3 to 2 mi N (above) Newcastle on rd to Hollywell and Hardwar Gap, from 18°4.688'N, 76°43.158'W (at 1.3 mi) to 18° 4.955'N, 76°43.531'W (at 2 mi), and also at Hardwar Gap, along Oatley Trail, at 18°5.268'N, 76°43.651'W, 1200–1300 m, 11 Jan 2011, *Judd et al. 8301* (FLAS, IJ, NY). **PUERTO RICO:** Naguabo, Bo. Río Blanco, Caribbean National Forest, along 1.5 km stretch up Río Sabana S of closed portion of Rt 191, 480–600 m, 29 Feb 1991, *Axelrod & Chavez 4119* (NY); Caribbean National Forest, along Rt 191, just S of jct with rd to summit of El Yunque, 18°17'N, 65°47'W, 600 m, 4 Jan 1987, *Boom 6880* (MO); Caribbean National Forest, along Hwy 988 between Hwy 191 and Hwy 983, 100–200 m, 12 Jan 1987, *Boom & Marshall 7084* (MO, NY); Caribbean National Forest, along hwy 191 just N of landslide, 18°17'N, 65°47'W, 600 m, 16 Mar 1990, *Boom 9793* (NY); Caribbean National Forest, Hwy 191 ca. 1 mi N of landslide, 18°17'N, 65°47'W, 600 m, 4 Jan 1992, *Boom 10270* (NY); Mt. Alegrillo, 900 m, 3 Apr 1913, *Britton et al. 2594* (F, NY, US); Catalina-Yunque trail, 500 m, 23–26 Feb 1923, *Britton & Bruner 7659* (NY); without definite locality, 26 Nov–4 Dec 1963, *Duke 7062* (MO); along Río Cuby, off Rt 191 through Luquillo Mts., 21 Mar 1966, *Evans 70* (A); El Yunque, 600 m, 1926, *Gleason & Cook M-118* (NY); N side, Luquillo Mts., 13 Apr 1899, *Heller*

& Heller 1068 (F, NY); El Yunque, Jul 1933, Horn 9 (NY); Luquillo National Forest, along Rt 186 where it crosses Río Espirita Santo, S of El Verde, 410 m, 14 Jun 1991, Judd & Judd 6028 (FLAS); Maricao State Forest, 800 m, 30 Mar 1964, Liogier 10754 (NY); Maricao State Forest, 800 m, 31 Mar 1964, Liogier 10781 (NY, US); Luquillo Mts., near Pico del Este, 1050 m, 3 Aug 1982, Liogier et al. 33323 (MO, NY); Luquillo Mts., El Yunque, 900 m, 16 Mar 1983, Liogier et al. 34045 (MO, NY); Luquillo Mts., Hwy 191, km 21.4, 2000–2500 ft, 10 Jul 1966, Little 21616 (NY); Luquillo Mts., Hwy 191, km 17.3, 2000–2500 ft, 10 Jul 1966, Little 21619 (GH, NY, US); Caribbean National Forest, El Verde Research Station, LTER Plot, 18°20'N, 65°45'W, 350 m, 26 Jan 1990, Moestl & Atwell 52 (NY); Sierra de Luquillo, Caribbean National Forest, Rd 191, km 19, 650 m, 20 Mar 1987, Proctor 43197 (US); Sierra de Naguabo, Loma Icaco, 210–675 m, 24 Jul 1914, Shafer 3445 (NY); Sierra de Luquillo, in monte Jimenes, Jun 1885, Sintenis 1564 (US); Sierra de Naguabo, ad los Ranchones, 30 Oct 1986, Sintenis 5439 (NY); Lares, in sylvia ad Buenos Aires, 29 Jan 1887, Sintenis 6104 (F, MO, MSC, NY, US); Sierra de Cayey, Carite Forest Reserve, Mpio. de Patillas, Barrio Muñoz Rizera, Rd 184 at km 18.6, 18°05'68"N, 66°02'49"W, 596 m, 15 May 1996, Slean & Proctor 3743 (MICH); Mpio. de Patillas, property of Tropic Ventures, at km 16.1 of Rt 184, 500 m, 8 Mar 1987, Taylor & Scott 7418 (DUKE); Cayey, Bo. Farallón, Carite State Forest, Rd 179, ca. 2 km S of intersection with Rd 184, 18°06.824'N, 66°04.725'W, 750 m, 6 Jul 1904, Trejo et al. 2702 (F, FLAS); at km 15.7 on Palmer to Florida rd through Luquillo Mts., 7 Apr 1964, Wagner 521 (A); along Rt 191 at km 16.7 on S side of Luquillo Mts., 21 Apr 1968, Wagner 1473 (A, DUKE); Guavate Forest, 2200 ft, 15 Feb 1962, Woodbury s.n. (NY); El Yunque, 21 Jan 1967, Woodbury s.n. (NY).

Although widespread in the Caribbean region, no geographically correlated patterns of morphological variation were discerned. The name *Miconia abeggii*, based on a single specimen (the type) from the Massif du Nord, Haiti, with leaves larger than is typical for the species, represents a rapidly growing vegetative shoot. This specimen falls within the pattern of variation of the species, when numerous specimens (including rapidly growing, vegetative shoots) are considered. The specimen is here designated as the lectotype of *M. abeggii* because it is very likely that a specimen once existed at B (now destroyed); additionally other specimens may exist.

Howard and Kellogg (1986), when designating the lectotype of *Melastoma tetrandrum*, did not specify (in their publication) which of the two duplicates at Stockholm (S) was chosen. Thus, a second-step lectotypification (see Turland et al. 2018: Art. 9.17) is required, and we designate S-R-3485 as the lectotype, in agreement with the annotation of E. A. Kellogg.

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