

Two New Species of Melastomataceae from Southern Mesoamerica

Ricardo Kriebel^{1,3}, Frank Almeda¹, and Armando Estrada²

¹Department of Botany, California Academy of Sciences, 875 Howard St., San Francisco, California 94103-3098; e-mail rkriebel@calacademy.org; falmeda@calacademy.org.

²Herbario Nacional, Museo Nacional de Costa Rica, Apartado 749-1000, San José, Costa Rica.

³Instituto Nacional de Biodiversidad, Apartado 22-3100, Santo Domingo de Heredia, Costa Rica

Two new species of Melastomataceae, *Blakea venusta* (Blakeeae), endemic to Costa Rica, and *Miconia dissitinervia* (Miconieae), restricted to Costa Rica and Panama are described and illustrated. *Blakea venusta* is distinguished by its epiphytic, pendent habit, copious indument of spreading reddish-brown hairs, and paired leaves at a node that are commonly dimorphic in size. *Miconia dissitinervia* is characterized by a calyx that is fused in bud but ruptures at anthesis into irregular hyaline lobes. Distributional and phenological notes are provided together with diagnostic illustrations, photographs taken in the field, and keys to separate these species from their presumed closest relatives.

Resumen

Dos nuevas especies de Melastomataceae, *Blakea venusta* (Blakeeae), endémica de Costa Rica, y *Miconia dissitinervia* (Miconieae) restringida a Costa Rica y Panamá son descritas e ilustradas. *Blakea venusta* muestra un carácter vegetativo poco común en el género, sus hojas fuertemente dimórficas en tamaño por nudo; *Miconia dissitinervia* por otro lado, presenta un carácter del andróceo que comparte con pocos congéneres, su caliz fusionado en botón y que se rompe en antésis en lóbulos irregulares hialinos. También se incluyen notas sobre distribución y fenología, así como fotografías y claves para separar las especies de sus parientes más cercanos.

Two new species of berry-fruited Melastomataceae, *Blakea venusta* and *Miconia dissitinervia*, are described from Costa Rica and Panamá in the Mesoamerican biodiversity hotspot (Mittermeier et al., 1999; Mittermeier et al. 2004). Description of a new *Blakea* now brings the number of Mesoamerican species in that genus to 34, over 75% of which are restricted to Costa Rica and Panamá (Almeda 2000a). Addition of another species of *Miconia* brings the total number of species in that genus for the Mesoamerican region to 163, 127 of which are also known only from Costa Rica and Panamá. Almeda (2000a, 2000b) commented on the importance of this southern Mesoamerican area as a secondary center of diversity for both of these genera and predicted that additional taxa would come to light as remote areas were explored. Discovery of the two species described here suggests that continued exploration of readily accessible collecting sites throughout the year will continue to yield new and noteworthy taxa.

Blakea venusta Kriebel, Almeda & Estrada, sp. nov.

Figs. 1, 2D.

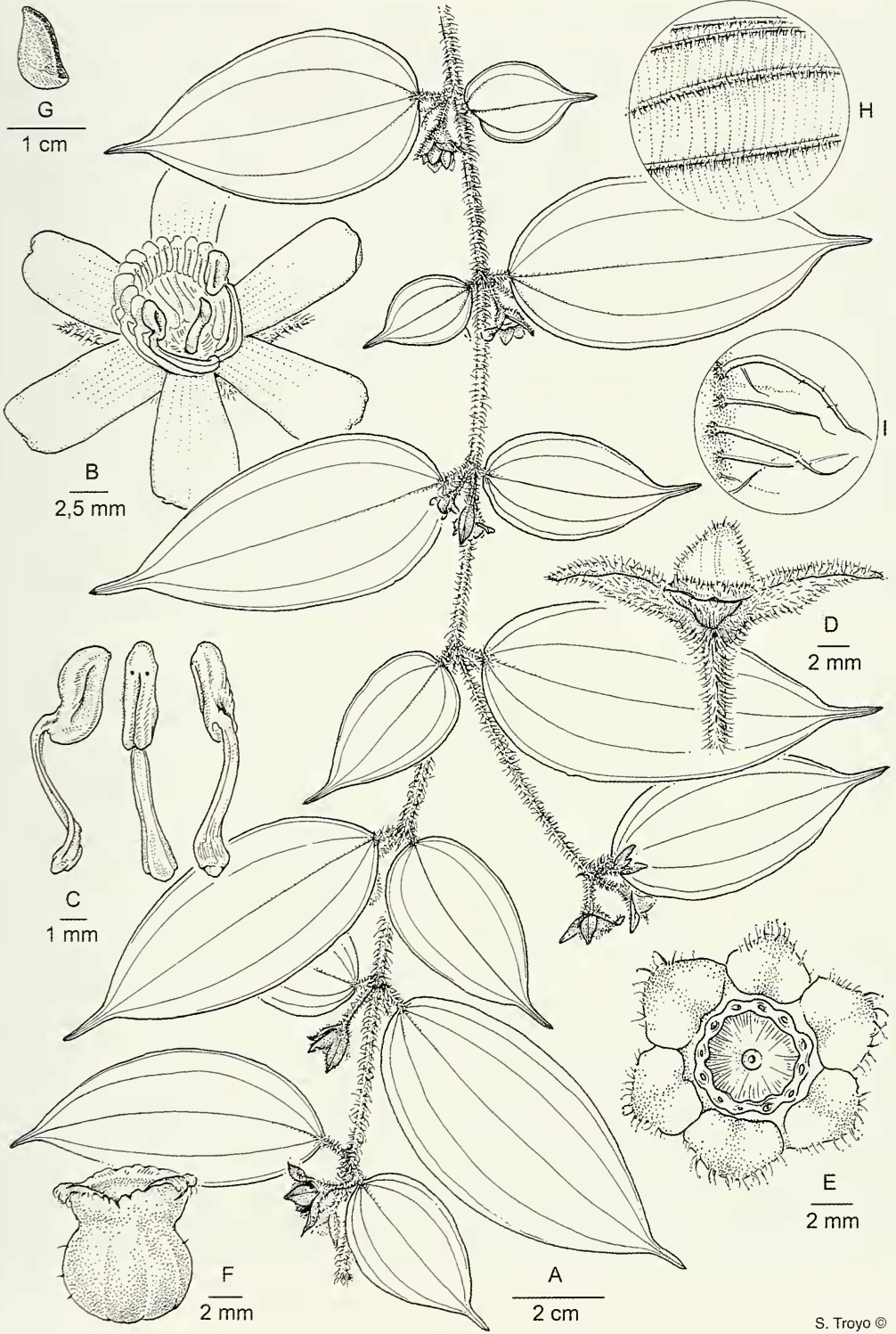
TYPE.— COSTA RICA: **San José:** Pérez Zeledón, Cordillera de Talamanca, Carretera Interamericana km 115-116, bosque primario y secundario a la par del camino entre División y Hortensia, 9°28'40", 83°41'25", 1750 m, 12 Nov. 2003 (fl, fr), R. Kriebel & D. Solano 4081 (Holotype: INB!; Isotypes: CAS!, CR!, MO!).

Frutex epiphyticus. Ramuli sicut petioli, folia subtus pedunculi setosi 1–3.5 mm longis induti. Folia in quoque pari dimorpha chartacea integra apice caudato-acuminata basi obtusa vel rotundata. Folia maiora: lamina 5–9.9 × 2.6–5.2 cm lanceolato-ovata, elliptica vel elliptico-ovata, 5-nervata. Folia minora: lamina 1–4 × 1–2.4 cm, ovata vel suborbiculata, 3-nervata. Flores 6-meri in quoque nodo 1–3; pedunculi 3–12 mm longis; bracteae omnino liberae; bracteae exteriores 7–15 × 2.5–4.5 mm, lanceolatae vel elliptico-lanceolatae; bracteae interiores 5–11 × 4–6 mm, ovato-lanceolatae. Calycis tubus 1–1.5 mm longus, lobis 1.5–2.5 × 3.5–4.5 mm. Petala 13–17 × 5–7 mm oblonga. Antherarum thecae 4 × 2 mm oblongae inter se cohaerentes apice minute biporosae; connectivum nec prolongatum nec appendiculatum. Ovarium 6-loculare, omnino inferum, apice papilloso.

Epiphytic shrub with sprawling, subscaudent or pendent branchlets. Young vegetative buds, internodes, petioles, abaxial foliar surfaces, floral peduncles and bracts densely setose with simple, basally barbed reddish-brown hairs, 1–3.5 mm long. Leaves at a node slightly unequal to generally very unequal in length, somewhat dimorphic to isomorphic in shape, chartaceous, sparsely villous to glabrous adaxially, apex caudate-acuminate, base obtuse to rounded, margin entire. Large leaves at a node: blade 5–9.9 × 2.6–5.2 cm, lanceolate-ovate, elliptic, elliptic-ovate or elliptic-oblong, 5-nerved; petioles 2–7 mm long. Small leaves a node: blade 1–4 × 1–2.4 cm, broadly lanceolate, ovate or suborbicular, 3-nerved; petioles 0.5–5 mm. Flowers spreading but not pendent, frequently hidden under subtending leaves, 1–3 flowers in each leaf axil; peduncles 3–12 mm long. Floral bracts foliaceous, all free from one another, typically longer than the hypanthium proper in length, adaxially moderately covered with spreading basally barbed hairs, margin entire; outer bracts 7–15 × 2.5–4.5 mm, lanceolate to elliptic-lanceolate, apex acuminate, with a somewhat conspicuous midvein; inner bracts 5–11 × 4–6 mm, ovate-lanceolate, apex acute. Calyx tube 1–1.5 mm long; free portions of the calyx lobes 1.5–2.5 mm long and 3.5–4.5 mm wide, broadly deltoid to rounded-deltoid, with each lobe terminating in a blunt reflexed callose thickening, margin entire and beset with gland-tipped hairs, the adaxial surface papillose and strigillose with barbellate hairs especially towards the apex, abaxial surface sparsely papillose and strigillose with roughened hairs grading into stellate hairs basally. Petals 6, 13–17 × 5–7 mm, white, oblong, obliquely rounded apically, entire and sparsely beset with gland-tipped hairs. Stamens 12; staminal filaments 6.5–8.5 mm long, declined to one side of the flower opposing the style, white, inconspicuously flushed with pink basally; anthers 4 × 2 mm, yellow, laterally connate for practically their entire length, oblong and somewhat arcuate in dorsal view, laterally compressed, the two pores positioned 0.5–0.75 mm below the apex of the anther on the ventral face, connective simple. Ovary 6-locular, papillose and truncate apically. Style erect and somewhat incurved distally, 8.5–9.5 mm long, glabrous, distal half white and basal half pink; stigma punctiform. Berry globose, 8–10 × 6–8 mm, moderately to sparingly stellulate-furfuraceous. Seeds mostly 1 mm long, beige, narrowly pyriform.

DISTRIBUTION AND PHENOLOGY.— A local species presently known only from Costa Rica where it occurs in cloud forests at 1300–1750 m on the Pacific slope of the Cordillera de

FIGURE 1 (right). *Blakea venusta* Kriebel, Almeda & Estrada. A, habit; B, fully expanded flower; C, representative stamens; D, hypanthium with subtending floral bracts, (one inner bract, petals, style, and stamens removed); E, top view of young fruit showing stylar scar, toral ring, and calyx lobes; F, berry; G, representative seed; H, enlargement of primary foliar veins (abaxial surface); I, enlargement of indument on cauline internodes. (A-I from Kriebel & Solano 4081.)



Talamanca. *Blakea venusta* is common to abundant at both of its known localities and grows sympatrically with other rare species of Melastomataceae such as *Clidemia davidsei* Almeda, *Blakea wilsoniorum* Almeda, *Henriettella trachyphylla* Triana, *Miconia cremadena* Gleason and *M. costaricensis* Cogn. Collected in flower and fruit in September and November; also with fruits in June.

PARATYPES.— COSTA RICA: **San José:** Pérez Zeledón, Cordillera de Talamanca, Carretera Interamericana, km 115–116, bosque primario y secundario a la par del camino entre División y Hortensia, 9°28'40", 83°41'25", 1750 m, 3 June 2003 (fr), *Kriebel & Hammel 3340* (CAS, CR, INB, MO); Pérez Zeledón, Cordillera de Talamanca, P.N. Chirripó, Estación Santa Elena, colectado a orilla de río y potrero, 9°23'36", 83°35'21", 1300–1400 m, 17 Sep. 1997 (fl, fr), *Alfaro 1420* (CR, INB, MO).

Blakea venusta is readily recognized by its dense setose indument of simple, basally barbed reddish-brown hairs 1–3.5 mm long on young vegetative buds, internodes, petioles, abaxial foliar surface, floral peduncles and bracts, leaves that are strongly dimorphic in size at each node, short pedunculate flowers, calyx lobes and petals marginally beset with gland-tipped hairs, and anthers laterally connate for practically their entire length. In the most recent key to species of *Blakea* in Mexico and Central America (Almeda, 2000a), *B. venusta* keys to couplet 12 next to *B. guatemalensis* and *B. foliacea*, clearly its presumed closest relatives on the basis of foliar dimorphism, inner and outer floral bracts that are free to the base, and laterally connate anthers. The three species can be distinguished by the following key:

1. Uppermost internodes, young vegetative buds, and floral peduncles densely to moderately covered with a scurfy paleaceous indument intermixed with or sometimes replaced by ± flattened, roughened hairs or varying to nearly glabrous with age; leaf blades either subpeltate or bearing domatia; peduncles 1.2–5.7 cm; calyx lobe and petal margin lacking glandular hairs; connective dorsally appendaged
 2. Leaf blades subpeltate at the base, lacking inconspicuous domatia in the angles between the median vein and each of the two innermost veins on the abaxial surface
..... *B. guatemalensis* Donn. Sm.
 - 2'. Leaf blades not subpeltate at the base, inconspicuous domatia (these often ruptured) typically formed in the angles between the median vein and each of the two innermost veins on the abaxial surface
..... *B. foliacea* Gleason
- 1'. Uppermost internodes, young vegetative buds, and floral peduncles densely covered with simple, basally barbed reddish-brown hairs 1–3.5 mm long; leaf blades neither subpeltate nor bearing domatia; peduncles 0.3–1.2 cm; calyx lobe and petal margin sparsely beset with glandular hairs; connective unappendaged
..... *B. venusta* Kriebel, Almeda & Estrada

Miconia dissitinervia Kriebel, Almeda & Estrada, sp. nov.

Figs. 2A–C, 3.

TYPE.— COSTA RICA: **San José:** Turrubares, San Juan de Mata. Area no protegida. Lajas. 9°42'20"N 84°35'13"W, elev. 600 m, 26 Nov. 1983, *A. Estrada et. al. 3101* (Holotype: CR!; Isotypes: CAS!, INB!, MO!).

Section *Amblyarrhena*. Frutex vel arbuscula 1–5 m altus. Ramuli obscure quadrangulati sicut petioli folia subtus inflorescentia hypanthiaque dense stellatis induti. Petioli 1.5–2.5 cm longi; lam-

FIGURE 2 (right). *Miconia dissitinervia* Kriebel, Almeda & Estrada. A. habit showing inflorescence; B. close-up of fully expanded flower showing reflexed petals; C. representative leaf showing abaxial surface; D. *Blakea venusta* Kriebel, Almeda & Estrada, fully expanded flower showing declinate semicircle of connate anthers. (A–C from live material of *Kriebel et al. 5046*; D from live material of *Kriebel & Solano 4081*.)



A



B



C



D

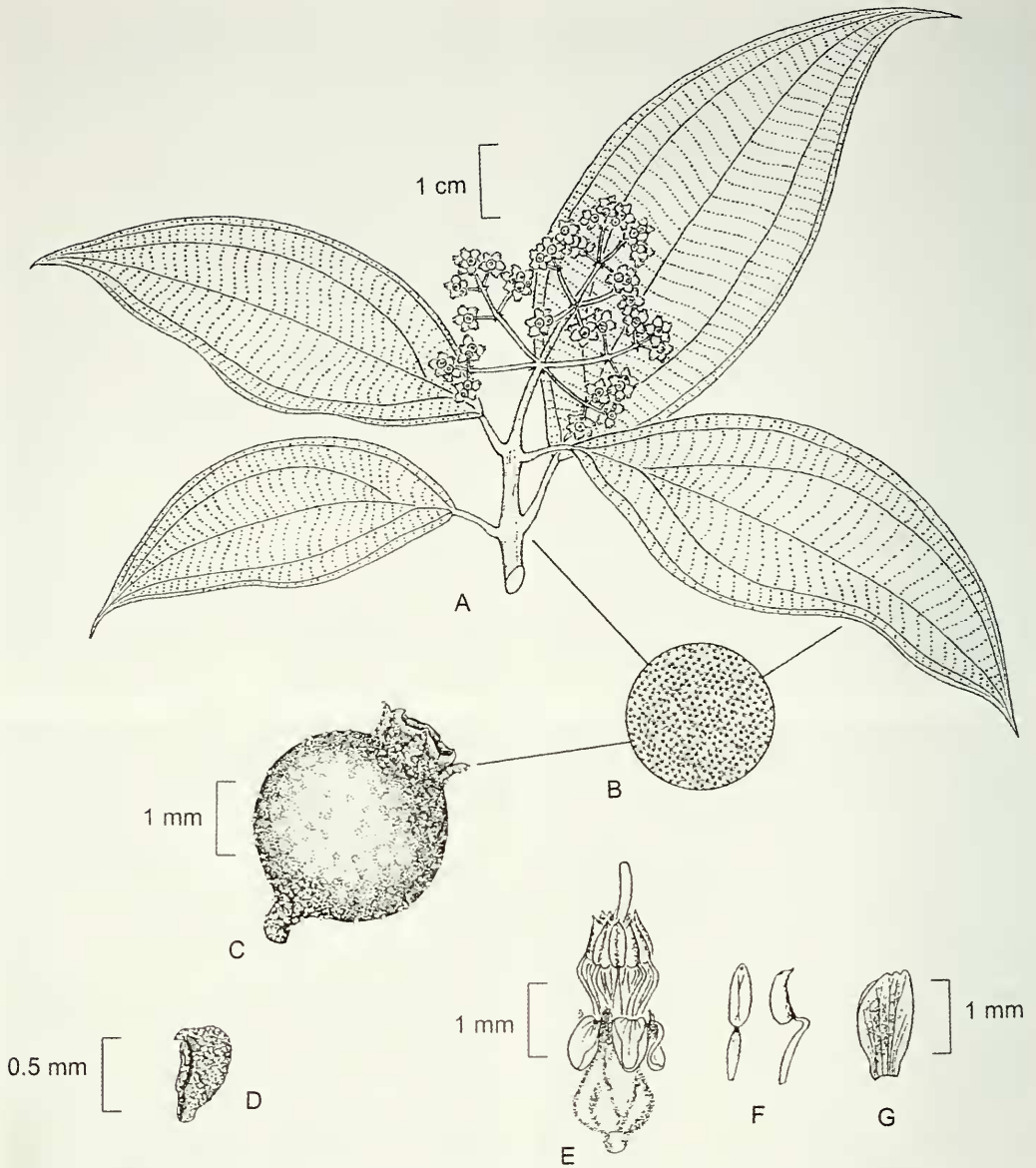


FIGURE 3. *Miconia dissimulata* Kriebel, Almeda & Estrada. A. habit with infructescence; B. enlargement of stellate indument on foliar and hypanthial surfaces; C. berry; D. representative seed; E. fully expanded flower; F. stamens, ventral view (left) and profile view (right); G. representative petal, adaxial surface. (A-G from Aguilar 4977.)

ina 10–35 × 5–15 cm elliptica vel elliptico-ovata, 3–5-plinervata. Panicula 8–10 cm longa multiflora; flores 5-meri, pedicellis (ad anthesim) 0.25–0.5 mm longis, bracteolis 1 mm longis. Hypanthium (ad torum) 2 mm longum: calyx primum in cono apiculato clausus demum in lobos irregulares persistentes ruptus, dentibus exterioribus 0.15–0.25 mm eminentibus. Petala ca. 2 × 1 mm oblonga papillosa. Stamina isomorphica glabra: filamenta 1.5 mm longa; antherarum thecae 1 × 0.4 mm angustae oblongae, poro ventraliter inclinato; connectivum nec prolongatum nec appendiculatum. Stylus 3–4 mm glaber; ovarium 5-loculare et omnino apice glabro.

Shrub to small tree 1–5 m tall; uppermost branchlets, vegetative buds, petioles, lower leaf-surfaces, inflorescences, bracts, bracteoles, and hypanthia completely covered with an indument of stellate hairs. Leaves of a pair equal to unequal in size; petioles 1.5–2.5 cm long; leaf-blades 10–35 × 5–15 cm, chartaceous, elliptic (sometimes broadly so) to elliptic-ovate, margin entire to inconspicuously crenulate, apex acuminate to long-acuminate, base acute to long-attenuate, 3–5-plinerved (excluding the ill-defined inframarginal pair) with the inner pair of primary subparallel veins diverging from the median vein in alternate or subalternate fashion. Inflorescence a terminal multiflowered panicle 8–10 cm long; bracts and bracteoles linear, 1–2 × 0.25–0.5 mm, caducous; pedicels 0.25–0.5 mm long. Hypanthia (at anthesis) urceolate, 2 mm long to the torus; calyx tube 0.25 mm long; calyx fused in bud but rupturing irregularly at anthesis into 2–5 persistent hyaline lobes; calyx teeth 0.15–0.25 mm long, narrowly triangular. Petals 5, ca. 2 × 1 mm, papillose adaxially, white, oblong, rounded to emarginate apically, conspicuously reflexed at anthesis. Stamens 10, isomorphic; filaments glabrous, complanate, 1.5 mm long; anthers 1 × 0.4 mm, yellow, linear-oblong, apiculate at the apex, laterally compressed and deeply ventrally channeled between the thecae ventrally, 2-celled, the single pore ventrally inclined; connective simple, neither prolonged nor appendaged. Ovary 5-locular, completely inferior, globose, the apex somewhat depressed. Style 3–4 mm long, erect, glabrous; stigma punctiform. Berry globose, purple at maturity, 4–5 mm in diameter; seeds 0.5 mm long, pyramidal, the testa muriculate to papillate.

DISTRIBUTION AND PHENOLOGY.— Known only from the Pacific slope of Costa Rica, from Turubares to the Península de Osa south to Panamá, where it has been collected at Puerto Armuelles on the Burica Peninsula from sea level to 600 m. Collected in flower between November and January and in fruit between November and June.

PARATYPES.— COSTA RICA: Puntarenas: Puerto Jiménez, Agujas, 08°33'N 83°23'W, 23 Jan. 1995, Aguilar & Azofofeifa 3710 (CAS, CR, INB, MO); Parque Nacional Corcovado, Estación Sirena, Sendero Ollas, 08°28'N 83°35'W, 9 Feb. 1994, Aguilar 3103 (CAS, CR, INB, MO); Parque Nacional Corcovado, Estación Sirena, Sendero Espaveles, 08°28'N 83°35'W, 16 Jan. 1997, Aguilar 4977 (CR, INB, MO); west of Rincón de Osa, Península de Osa, 9–12 Jan. 1970, Burger & Liesner 7253 (CR); along abandoned “high road” W of Rincón de Osa, 8°42'N 83°31'W, 4 Mar. 1985, Croat & Grayum 59849 (CAS, CR, MO); fila before Rancho Quemado, near Rincón, 08°42'N 83°33'W, 11 Jan. 1993, Gentry et al. 78687 (CAS, INB, MO); cerca del río Piro, Península de Osa, 29 Dec. 2004, Kriebel et al. 5046 (CAS, CR, INB, MO); Aguabuena, 3 km W of Rincón, 800 m N of house of Henry Monge, 4 June 1993, Thomsen 361 (CR). PANAMA. Chiriquí: Burica Península, San Bartolo Limite, 12 miles west of Puerto Armuelles, 24 Feb. 1973, Liesner 201 (CAS, CR).

DISCUSSION.— *Miconia dissitinervia* shares a number of diagnostic characters with *M. centrosperma* of Panamá. Both species have plinerved leaves, blunt calyx teeth, a completely inferior 5-locular ovary, unappendaged anther connectives and a punctiform stigma. They are easily separated by the characters enumerated in the key below. *Miconia dissitinervia* has been misidentified in the past as *Miconia argentea* (Sw.) DC. probably because of the shared stellate indument on abaxial foliar surfaces. *Miconia dissitinervia* differs from the latter in having plinerved vs. nerved foliar venation, a punctiform stigma vs. clavate-crateriform stigma, unappendaged anthers vs. appendaged anthers, an irregularly rupturing hyaline calyx vs. nonrupturing regularly developed calyx lobes, and seeds with a muriculate or papillate testa vs. an angulate, smooth testa.

Key to the Mesoamerican species of *Miconia* with a fused calyx that ruptures at anthesis.

- 1 Flowers 4-merous
2. Distal branches, petioles, and inflorescence densely covered with a mixture of rusty brown sessile-stellate and stipitate-stellate hairs; flowers with pedicels to 0.5 mm; anther pore somewhat ventrally inclined; connective neither prolonged nor appendaged
..... *M. calocoma* Almeda
- 2' Distal branches, petioles and inflorescence sparingly and deciduously covered with stellulate hairs and/or minute glands or uppermost internodes and adaxial petiolar surface sparsely covered with smooth hairs and minute and appressed glandular hairs; flowers sessile or essentially so; anther pore dorsally inclined; connective appendaged dorso-basally
- 3 Leaves 5-nerved; stigma not expanded; ovary (2)–3-locular
..... *M. valeriana* (Standl.) Wurdack
- 3' Leaves 5-plinerved; stigma capitate; ovary 4-locular *M. centrodesma* Naudin
- 1' Flowers 5(–6)-merous
- 4 Abaxial leaf surface completely covered with an indumenta of stellate or stellate-lepidote hairs resulting in a white to reddish-white color
- 5 Leaf blades 7.5–12 × 2.4–4 cm, 3-plinerved, stellate-lepidote abaxially; inflorescences 2–2.5 cm long; petals glabrous; ovary apex densely setose around the stylar scar; seeds with a conspicuous spur at the wider truncate end *M. centrosperma* Almeda
- 5' Leaf blades 10–35 cm × 5–15 cm, 5-plinerved, stellate abaxially; inflorescences 8–10 cm long; petals papillose adaxially; ovary apex glabrous; seeds lacking a conspicuous spur on the truncate distal end *M. dissitinervia* Kriebel, Almeda & Estrada
- 4' Abaxial leaf surface variously pubescent but never completely covered with a conspicuous white or reddish-white indument
- 6 Abaxial leaf surface minutely and deciduously glandular-punctulate to glabrous on the actual surface and copiously beset with tufts of stalked-stellate hairs where the innermost primary veins diverge from the median vein; ovary 3-locular
..... *M. mexicana* (Bonpl.) Naudin
- 6' Abaxial leaf surface variously pubescent but never beset with tufts of stalked-stellate hairs only where the innermost primary veins diverge from the median vein; ovary (4) 5-locular
- 7 Leaf blades 5–7-plinerved; flowers on pedicels 0.5–2.5 mm
- 8 Leaves subsessile and clasping or sometimes with petioles 1–5(–9) mm long; stamens dimorphic, the larger ones antepetalous *M. dissitiflora* Almeda
- 8' Leaves with petioles 1.5–9 cm long; stamens isomorphic
- 9 Young cauline internodes, petioles, and hypanthia densely covered with inconspicuously stalked asperous-headed hairs; inflorescence erect and branched basally at the node from which it is initiated; mature leaf blades 5-plinerved. *M. friedmaniorum* Almeda & Umaña
- 9' Young cauline internodes, petioles, and hypanthia densely covered with a lanate indument of curly or sinuate barbed or distally bifid hairs that are intermixed with and grade into a ground layer of shorter amorpho-pinoid hairs; inflorescence arcuate or pendent and branched well above the node from which it is initiated; mature leaf blades 7-plinerved
..... *M. pendula* Umaña & Almeda
- 7' Leaf blades 3–5-nerved; flowers sessile or essentially so

- 10 Branchlets, petioles, elevated primary leaf veins beneath, and inflorescences densely covered with stalked-stellate hairs; bracteoles oblong
 *M. dorsiloba* Gleason
- 10' Branchlets, vegetative buds, inflorescences, and hypanthia sparsely and deciduously stellulate-furfuraceous or uppermost internodes, adaxial surfaces of the petioles and leaf blades sparsely covered with smooth hairs (gland-tipped in part) 0.5–2.5 mm long underlain with minute glandular hairs; bracteoles setiform or subulate-setose
- 11 Leaf blades 6–20 × 3–8.9 cm, 5-nerved, adaxially sparsely covered with smooth hairs (gland-tipped in part) 0.5–2.5 mm underlain with minute glandular hairs; petals glabrous; stigma capitate
 *M. valeriana* (Standl.) Wurdack
- 11' Leaf blades 12–39 × 6.5–20.5 cm, 3-nerved, glabrous; petals densely granulose-papillose; stigma barely expanded. . . *M. lamprophylla* Triana

ACKNOWLEDGMENTS

We are grateful to Silvia Troyo (Fig. 1) and Claudia Aragon (Fig. 3) for the illustrations and Alan Chou and Dominique Jackson for technical assistance. The first author thanks Daniel Solano, Daniel Santamaria, Barry Hammel and Reinaldo Aguilar for companionship on field trips that resulted in some collections of the new taxa treated here. Two anonymous reviewers also offered most useful comments. The photographs in Figure 2 were taken by Ricardo Kriebel.

LITERATURE CITED

- ALMEDA, F. 2000a. A synopsis of the genus *Blakea* (Melastomataceae) in Mexico and Central America. *Novon* 10:299–319.
- ALMEDA, F. 2000b. New Costa Rican and Panamanian Species of *Miconia* (Melastomataceae: Miconieae). *Proceedings of the California Academy of Sciences*, ser. 4, 52(4):33–54.
- MITTERMEIER, R. A., N. MYERS, AND C.G. MITTERMEIER. 1999. *Hotspots: Earth's Biologically Richest and Most Endangered Terrestrial Ecoregions*. CEMEX/ Agrupación Sierra Madre, Mexico City, Mexico. 432 pp.
- MITTERMEIER, R.A., P.R. GIL, M. HOFFMANN, J. PILGRIM, T. BROOKS, C.G. MITTERMEIER, J. LAMOREUX, AND G.A.B. FONSECA. 2004. *Hotspots Revisited*. CEMEX/ Agrupación Sierra Madre, Mexico City, Mexico. 390 pp.