

NEW, RECONSIDERED, AND LITTLE-KNOWN MEXICAN SPECIES OF RUELLIA (ACANTHACEAE)

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Ruellia L. is the second largest genus of Acanthaceae with approximately 250 species of herbs, shrubs, and trees occurring primarily in the tropics and subtropics. It is the second largest genus among Mexican Acanthaceae with some 65 species distributed throughout the country. During my studies of this large and morphologically variable genus for various floristic projects in Mexico several nomenclatural and taxonomic problems became evident. Some of these are resolved below.

A NEW COMBINATION AND THE IDENTITY OF GYMNACANTHUS

Ruellia petiolaris (Nees) T. F. Daniel, comb. nov. *Gymnacanthus petiolaris* Nees in Lindl., Nat. Syst. Bot., ed. 2, 444. 1836, non *Ruellia petiolaris* Boj. ex Nees in DC, 1847, pro syn.—TYPE. MEXICO. Guerrero: Acapulco, 1791, *Haenke s.n.*, “1655” subsequently written on sheet (holotype: likely at PR; isotype: F!).

Sclerocalyx mexicanus Nees in Benth., Bot. voy. Sulphur 145. 1846.—TYPE. MEXICO. Guerrero: Acapulco, *Hinds W41* (holotype: K!).

Ruellia palmeri Greenman, Publ. Field Columbian Mus., Bot. Ser. 2: 343. 1912, non *Ruellia palmeri* Tharp & Barkley, 1949.—TYPE. MEXICO. Guerrero: vicinity of Acapulco, Feb 1895, *Palmer* 382 (holotype: F!; isotypes: BM! GH, K! UC! US!).

Ruellia montezumae Lindau, Repert. Spec. Nov. Regni Veg. 12: 424. 1913. nomen illegit.—SYNTYPES. MEXICO. Guerrero: Acapulco, Feb 1895, *Palmer* 382; Sierra Madre, 9 Feb 1899, *Langlassé* 846 (G! K! P! US!). Oaxaca: without locality, 1842, *Ghiesbreght s.n.* (G! K! P!).

Shrub to 3.6 m tall. Young stems subquadrate to quadrate, evenly pubescent with straight to antrorse, eglandular trichomes 0.05–0.7 mm long and covered with sessile, patelliform glands up to 0.2 mm in diameter, the older stems becoming glabrate and usually covered with whitish, blisterlike protuberances. Leaves petiolate, the petioles to 40 mm long, the blades lance-ovate to ovate to elliptic, 30–175 mm long, 13–87 mm wide, 1.6–3.5 times longer than wide, truncate to rounded to acute at base, acuminate at apex, the surfaces covered with sessile, patelliform glands and pubescent with eglandular trichomes (sparsely so with age), the margin entire, flat, ciliate with antrorse trichomes. Flowers solitary in axils of distal leaves and leaflike bracts (these often congested into a terminal cluster), pedicellate, the pedicels to 20 mm long, pubescent like young stems. Bracts petiolate, ovate-elliptic to elliptic, 10–50 mm long, 4–22 mm wide, pubescent like leaves. Bractlets absent. Calyx 17–27 mm long, the tube 3–4 mm long, the lobes elliptic to lanceolate to

oblanceolate, 14–23 mm long, 4–6 mm wide, the abaxial surface covered with sessile, patelliform glands and pubescent like young stems or with a denser, feltlike indument, the adaxial surface and margin densely pubescent with white, antrorse to crinkled trichomes forming a feltlike indument (the margins thus appearing conspicuously whitish). Corolla pale yellow to yellow-green to whitish, 50–90 mm long, externally covered with sessile, patelliform glands and pubescent with straight to flexuose, eglandular trichomes to 0.7 mm long, the tube 10–25 mm long, shorter than throat, the throat (from point of expansion of slender tube to base of limb) saccate, 22–40 mm long, 19–24 mm in diameter near midpoint, the limb 40–65 mm in diameter with lobes triangular to ovate, 15–32 mm long, 10–18 mm wide. Stamens inserted near middle of throat, exerted, didynamous, the shorter pair 45–67 mm long, the longer pair 50–69 mm long, the thecae 7–9 mm long. Style 81–102 mm long, glabrous distally, pubescent proximally; stigmatic lobes unequal with one 2–3.5 mm long, and the other 0.2–0.8 mm long. Capsule subclavate, 13–16 mm long, covered with sessile, patelliform glands and densely pubescent with flexuose, eglandular trichomes to 0.5 mm long, the stipe 3–4 mm long, the head 10–12 mm long. Seeds up to 8 per capsule, subcirculate, 4–5.5 mm long, 4–5 mm wide, the surfaces covered with appressed, hygroscopic trichomes.

Distribution and habitats. Restricted to the Sierra Madre Sur of Michoacán, Guerrero, and Oaxaca in southwestern Mexico (Fig. 1). The plants occur at elevations from 350 to 2600 m in regions of montane, perennial forest (primarily dominated by oak and/or pine).

Phenology. Flowering November to March; fruiting February and March.

REPRESENTATIVE SPECIMENS. MEXICO. Guerrero: Acapulco, *Beechey s.n.* (K); Carretera Iguala-Acapulco, 1 km antes de Agua de Obispo, *Boege 2638* (CAS); 62.2 mi N of Acapulco toward Taxco,

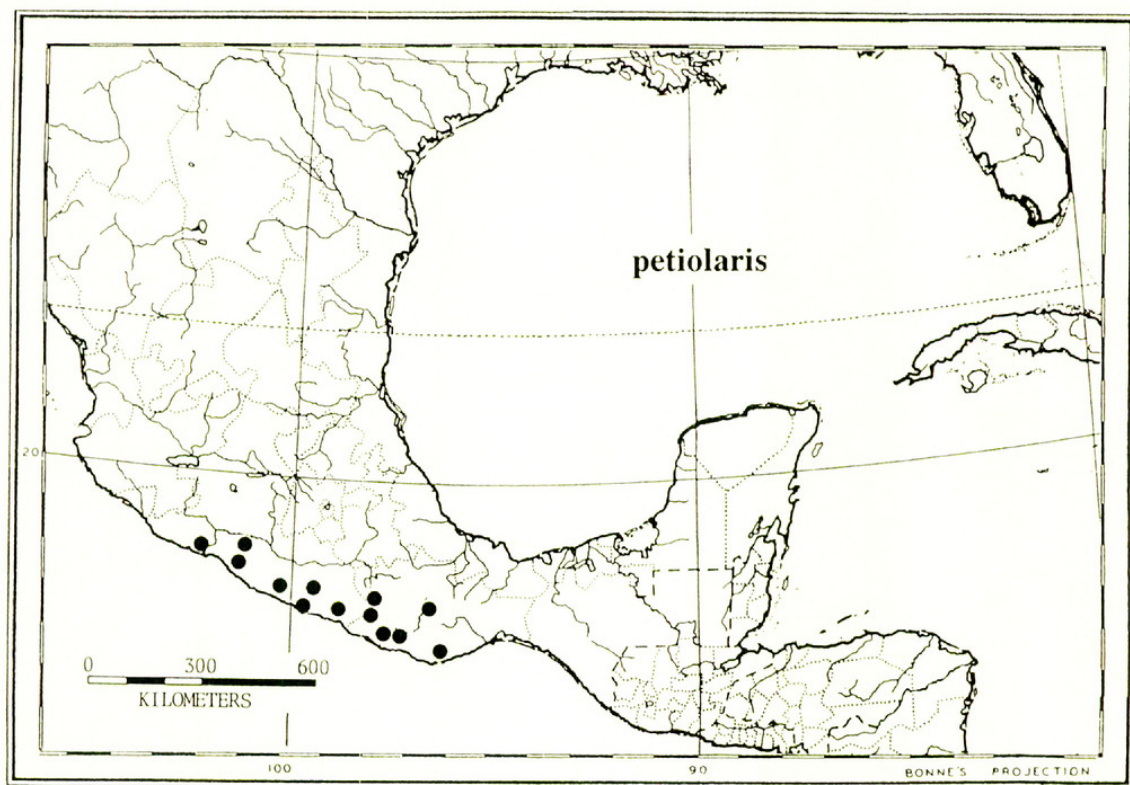


FIG. 1. Distribution of *Ruellia petiolaris*.

Carlson 3101 (CAS, US); Sierra Madre Sur, between El Paraíso and Puerto del Gallo, ca. 8 km NNE of El Paraíso, *Daniel & Bartholomew 4930* (CAS, DUKE, K, MEXU, MICH, MO, NY, US); between Chilpancingo and Tierra Colorada, ca. 42 km S of Chilpancingo, *Daniel & Bartholomew 4984* (CAS, K, MEXU); Distr. Montes de Oca, Vallecitos, *Hinton et al. 11757* (K, US); Mpio. Mochitlán, 37 km S de Chilpancingo, *Koch & Fryxell 83265* (CAS, CHAPA); Rincón Viejo, *Kruse 144* (ENCB); Mpio. San Luis Acatlán, 2.5 km N de Horcasitas, *Martínez S. & Morales de Jesús 3420* (CAS, CHAPA, ENCB, MEXU); entre Chilpancingo y Tierra Colorada, *Paray 753* (ENCB, MEXU); 5 km E de Guayameo, *Soto N. et al. 4942* (CAS, ENCB, MEXU); 14 km NE de Paraíso, *Soto N. & Martínez 5096* (CAS, CHAPA, ENCB, MEXU). Michoacán: ca. 25 km S of Arteaga, *McVaugh 22639* (ENCB). Oaxaca: near Finca El Carmen, *Alexander 500* (MEXU, UC, US); Distr. Juquila, del Ahuacate a Juquila, *Conzatti 4532* (US); along Hwy 125 between Pinotepa Nacional and Tlaxiaco, 5.8 mi N of Putla de Guerrero, *Croat 45880* (CAS); La Soledad (near Mitla), *Ernst 2560* (BM, MEXU, US); Juquila, San Gabriel Mixtepec, *MacDougall s.n.* (NY); Distr. Pochutla, vicinity of Concordia, *Makrinius 685* (US); Distr. Juquila, 17 km NE de Piedra Larga, *Martínez S. et al. 2752* (MEXU); Mpio. Putla, 17–18 km S of Putla, *McVaugh 22232* (ENCB); Mpio. Juquila, 16 km N of San Gabriel Mixtepec, *McVaugh 22401* (ENCB); from Río Verde to Panixtlahuaca, *Nelson 2387* (GH, US); Distr. Juquila, 3.8 km N de Piedra Larga, carr. Puerto Escondido-Oaxaca, *Torres C. & Antonio M. 6607* (CAS). State undetermined: Nueva España, *Sessé et al. s.n.* (G).

Using a *descriptio generico-specifica*, Nees (1836) described *Gymnacanthus* Nees and its sole species, *G. petiolaris*. In Bentham's account of the plants collected by the expedition of *H.M.S. Sulphur*, Nees (1846) described another monotypic genus, *Sclerocalyx* Nees. In his comprehensive treatment of Acanthaceae in de Candolle's *Prodromus*, which was published during the following year, Nees (1847) cited *Gymnacanthus* and *G. petiolaris* as synonyms of *Sclerocalyx* and *S. mexicanus* respectively. His retention of the later names over the earlier, validly published, ones is not in accordance with current nomenclatural rules (Greuter 1988). *Sclerocalyx* was maintained by Oersted (1854), Bentham (1876), and Hemsley (1882) as a monotypic genus having affinities with *Trichanthera* Kunth. [Oersted (1854) also erected a new genus, *Gymnacanthus* Oersted ("nec N. v. E.") for a new species and three species treated by Nees in *Dipteracanthus* Nees.] Lindau (1895) accepted the taxonomic validity of the genus but utilized the older and correct name, *Gymnacanthus*, for it. Inexplicably, he listed the single species as *G. mexicanus* Nees.

Lindau (1895) referred *Gymnacanthus* to the Trichanthereae, a tribe based in large part on its distinctive pollen morphology (Daniel 1988). Unfortunately, Lindau did not see pollen of *Gymnacanthus*, and his placement of this taxon in the Trichanthereae was likely based on the resemblance of the large, saccate (presumably bat-pollinated) flowers of *R. petiolaris* to those of *Trichanthera*. Pollen of *R. petiolaris* (Fig. 2d) is similar to that of other species of *Ruellia* (triporate and reticulate-homobrochate; e.g., Fig. 2e–g) rather than that of species of Trichanthereae (loxodicolporate and polystriate-foveolate; e.g., see Fig. 2 in Daniel, 1988). Similar large, saccate corollas are found in other Mexican species of *Ruellia* (e.g., *R. bourgaei* Hemsl.).

The earliest epithet for this species is *petiolaris*. The potential competing homonym, *Ruellia petiolaris* Boj. ex Nees, listed in Index Kewensis (Jackson 1895), was published as a synonym (Nees 1847) and is therefore nomenclaturally invalid (Greuter 1988).

Ruellia montezumae has to be rejected according to Article 63 of the International Code of Botanical Nomenclature (Greuter 1988). In the protologue Lindau (1913) provided three syntypes, one of which (*Palmer 382*) was the type of *R. palmeri*, a name published in the previous year.

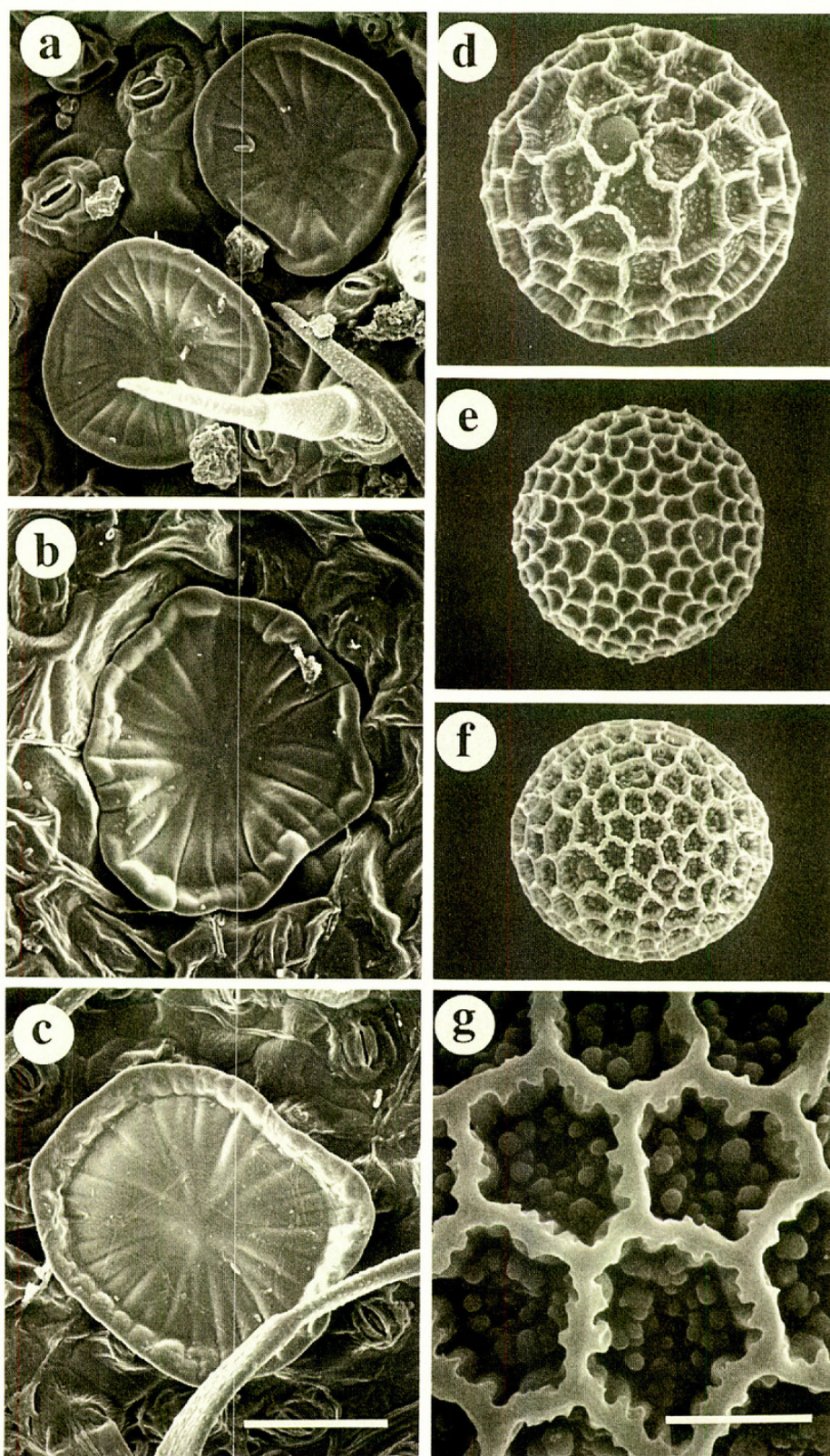


FIG. 2. Scanning electron micrographs of sessile glands on leaf surfaces and pollen of *Ruellia*. a–c, glands: a. *R. amoena* (Daniel & Butterwick 3261). b. *R. megasphaera* (Breedlove 56280). c. *R. foetida* (Pérez J. 261). d–g, pollen: d. *R. petiolaris* (Daniel & Bartholomew 4930). e. *R. mcvaughii* (Cowan & Nieves H. 4746). f. *R. novogaliciana* (Hinton et al. 12931). g. *R. novogaliciana* (Hinton et al. 12931). Scale: for a–f, bar in c=43 μ m; for g, bar=7.5 μ m.

A LITTLE-KNOWN SPECIES

Ruellia eumorphantha Lindau, Ann. Conserv. Jard. Bot. Genève 2: 38. 1898.—
TYPE. MEXICO. Oaxaca: without locality, Oct 1842, *Ghiesbreght s.n.* (holo-
type: G-DEL!; isotypes: K! P!).

Perennial herb to shrub to 3 m tall. Young stems terete to quadrate to quadrate-sulcate, the internodes mostly glabrous although usually with some retrorse, eglandular trichomes 0.1–0.3 mm long concentrated in lines for at least several mm below the nodes, the nodes usually sparsely pubescent with straight to flexuose, eglandular trichomes to 0.5 mm long. Leaves petiolate, the petioles up to 60 mm long, the blades ovate-elliptic to elliptic, 75–270 mm long, 18–75 mm wide, 2.7–5.4 times longer than wide, acute to subattenuate at base, acuminate to falcate at apex, the surfaces glabrous or with antrorse, eglandular trichomes along the major veins on the abaxial surface, the margin sinuate-crenate, undulate. Inflorescence of axillary, long-pedunculate, expanded dichasia, the peduncles terete, up to 175 mm long, glabrous, secondary peduncles terete, glabrous. Bractlets often caducous, petiolate, lanceolate to elliptic, 7–55 mm long, 1–9 mm wide, pubescent like leaves; secondary bractlets triangular to subulate to linear to oblanceolate, 1–4 mm long, 0.4–0.8 mm wide. Flowers pedicellate, the pedicels 2–4 mm long, glabrous. Calyx 4–6 mm long, the tube 1.5–4 mm long, shorter than to longer than lobes, the lobes triangular to subulate, 2–3 mm long, 0.7–1 mm wide, the abaxial surface glabrous to very sparsely pubescent with eglandular trichomes (and inconspicuous glands) 0.1–0.2 mm long, the adaxial surface densely pubescent with glandular and eglandular trichomes. Corolla magenta, 60–70 mm long, externally very sparsely pubescent with mostly straight, eglandular (and inconspicuous glandular) trichomes 0.05–0.2 mm long, the tube (from base to point of attachment of stamens) 28–36 mm long, gradually expanded into a funnelform throat 20–29 mm long, 10–13 mm in diameter near midpoint, the limb 23–28 mm in diameter with lobes linear-elliptic, 10–12.5 mm long, 5–6 mm wide. Stamens inserted at base of throat, exerted, nearly equal in length to conspicuously didynamous, 17–37 mm long, the thecae 3.3–4 mm long. Style 62–72 mm long, glabrous; stigmatic lobes unequal with one 1.5–2 mm long and the other 0.3–0.5 mm long. Capsule clavate, 20–25 mm long, glabrous, the stipe 7–11 mm long, the head 12–15 mm long. Seeds up to 16 per capsule, subcirculate to subelliptic, 3–3.5 mm long, 3 mm wide, the surfaces glabrous, the margin with a conspicuous band of papillalike (when dry), hygroscopic trichomes.

Distribution and habitats. Montane slopes of southwestern Mexico (Guerrero and Oaxaca) from 800 to 2700 m (Fig. 3). The plants occur in shaded situations of second growth and undisturbed moist forests commonly dominated by *Pinus*. *Daniel & Bartholomew 4927* was collected in a cafetal.

Phenology. Flowering October to March; fruiting November to March.

ADDITIONAL SPECIMENS EXAMINED. MEXICO. Guerrero: Sierra Madre Sur, between Atoyac and El Paraíso, 8 mi SW of El Paraíso, *Daniel & Bartholomew 4927* (CAS, K, MEXU, MICH); Sierra Madre, *Langlassé 908* (G, K, P, US); Mpio. Atoyac, Nueva Delhi, 23 km al NE de Paraíso, *Tenorio L. et al. 3222* (MEXU).—Oaxaca: between Oaxaca and Puerto Escondido, 10–30 km N of San Gabriel Mixtepec, *Anderson & Anderson 5610* (ENCB, MICH); from La Cumbre 9 mi along crest of San Felipe range to lumber camp, *Carlson 4048* (F); between Oaxaca and Pochutla, 21.9 mi S of Suchixtepec, *Croat 46103* (CAS); La Soledad, *Ernst 2524* (G, NY, US); Juquila, Lachao, near Río Sal, *MacDougall 575.S* (NY), *s.n.* 18 Dec 1969 (NY), *s.n.* 25 Dec 1969 (NY), *s.n.* 18 Feb 1971 (NY); KM 182–190, Oaxaca-Puerto

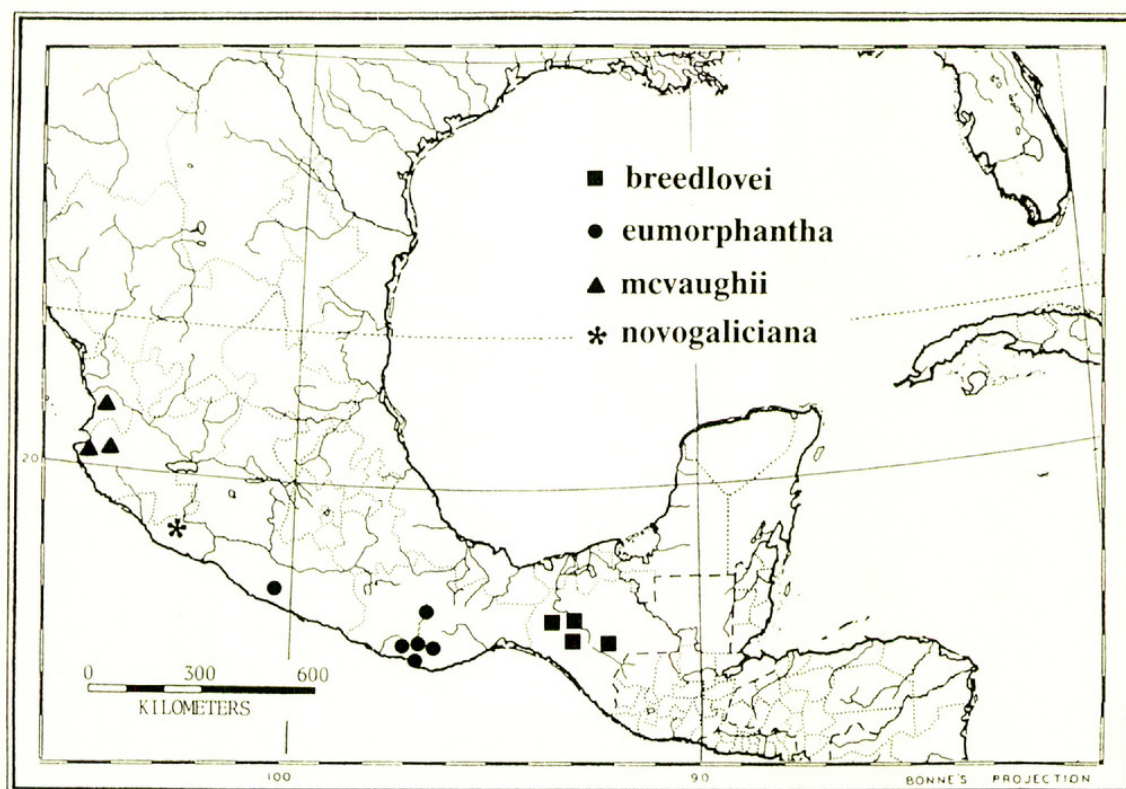


FIG. 3. Distribution of *Ruellia breedlovei*, *R. eumorphantha*, *R. mcvaughii*, and *R. novogaliciana*.

Escondido, *MacDougall s.n.* (MEXU); 19 km al NE de Piedra Larga, *Martínez S. et al.* 2821 (MEXU); Mpio. Juquila, ca. 80 km SSW of Sola de Vega, *McVaugh* 22366 (ENCB, MICH); Caf. S. Antonio, Pochutla, *Reko* 6161 (RSA).

Of the sixteen collections cited above, only the type bore the name of this species. Specimens of *Langlassé* 908 and *Ernst* 2524 had been annotated as an undescribed species.

Lindau (1898) included the species in sect. *Physiruellia* Lindau, characterized by capsules with a contracted, sterile base and corollas with a cylindric tube (Lindau 1895). (Interestingly, Lindau was able to place this species without seeing capsules, since none were on the type.) Lindau (1898) noted affinities between *R. eumorphantha* and *R. macrophylla* Vahl (southern Central America, West Indies, and South America). The former differs from Leonard's (1951) description of the latter in characters of the calyx (4–6 mm long with triangular to subulate lobes 0.7–1 mm wide at base vs. ca. 10 mm long with linear to lanceolate lobes 2 mm wide at base), corolla (magenta and 60–70 mm long vs. scarlet or crimson and 40–50 mm long), capsule (20–25 mm long vs. 14 mm long), and seed (pubescent only at margin vs. entire surface pubescent). *Ruellia eumorphantha* also resembles *R. pereducta* Standley (southern Mexico and northern Central America) and *R. matudae* Leonard (known only from Chiapas), both of which have pinkish (or red in *R. pereducta*), tubular corollas borne in long-pedunculate dichasia. Mexican individuals of these three species can be distinguished by the following key:

1. Peduncles terete; corolla 60–70 mm long, throat 10–13 mm in diameter near midpoint; style 62–72 mm long; capsule 20–25 mm long. *R. eumorphantha*.
1. Peduncles quadrate to quadrate-winged; corolla 31–45 mm long, throat 4.5–8 mm in diameter near midpoint; style 25–34 mm long; capsule 14–20 mm long.

2. Young stems quadrate, glabrous; leaves, peduncles, and bractlets glabrous; corolla dark pink; capsule 17–20 mm long, glabrous. *R. pereducta.*
2. Young stems quadrate-winged, pubescent with antrorse, eglandular trichomes 0.1–0.3 mm long; leaves, peduncles, and bractlets pubescent like young stems; corolla red; capsule 15–17 mm long, pubescent with glandular and eglandular trichomes. *R. matudae.*

A NEW SPECIES FROM CHIAPAS

Ruellia breedlovei T. F. Daniel, sp. nov.

Fig. 4.

TYPE. MEXICO. Chiapas: Cañón El Sumidero, near KM 19, vicinity of Mirador El Roblar, 16 Mar 1987, *Daniel & Bartholomew 5025* (holotype: CAS!; isotypes: DUKE! ENCB! K! MEXU! MICH! MO! NY! US!).

Frutex usque ad 1.4 m altus. Caules juniores quadrati vel quadrati-sulcati, internodia fere glabra. Folia petiolata, laminae ovatae vel late ovatae vel cordatae, 40–200 mm longae, 15–145 mm latae, 1.4–3.1-plo longiores quam latiores. Dichasia in axillis foliorum, longipedunculata pedunculis 37–130 mm longis quadratis vel quadratis-alatis. Bracteolae lanceolatae vel lanceolatae-subulatae. Calyx 7–18 mm longus, extus glandulosus. Corolla caerulea, 45–71 mm longa, extus glandulosa, tubo 14–25 mm longo fauce brevior. Capsula 17–24 mm longa, extus glandulosa. Semina 12–16.

Shrub to 1.4 m tall. Young stems quadrate to quadrate-sulcate, the internodes glabrous (rarely with a few scattered eglandular trichomes), or rarely more or less densely pubescent with flexuose-retrorse to retrorse-appressed, eglandular trichomes up to 0.5 mm long, the nodes often sparsely pubescent with flexuose, eglandular trichomes 0.1–0.5 mm long. Leaves petiolate, the petioles to 90 mm long, the blades ovate to broadly ovate to cordate, 40–200 mm long, 15–145 mm wide, 1.4–3.1 times longer than wide, cordate to rounded to acute at base, acuminate at apex, the surfaces pubescent, the trichomes soon becoming sparse and restricted to the major veins and margin, the margin entire to crenate, often undulate. Inflorescence of axillary, laterally spreading, pedunculate, expanded dichasia, the peduncles 37–130 mm long, sharply quadrate, the angles usually winged, glabrous or pubescent with flexuose to retrorse to antrorse to antrorse-appressed, eglandular trichomes 0.1–0.5 mm long. Bractlets sometimes caducous, petiolate, lanceolate, 10–45 mm long, 1.5–8 mm wide, pubescent like leaves; secondary bractlets similar to bractlets although somewhat smaller or becoming lance-subulate. Flowers subsessile to short-pedicellate, the pedicels to 4 mm long, glabrous or pubescent. Calyx 7–18 mm long, the tube 1.5–4 mm long, the lobes equal to subequal (i.e., with one lobe up to 2 mm longer than others), lance-subulate, 5–15 mm long, 0.8–1.2 mm wide, both abaxial and adaxial surfaces pubescent with a mixture of glandular and eglandular trichomes 0.05–0.4 mm long (glandular-pubescent). Corolla blue-purple, 45–71 mm long, externally glandular-pubescent, the tube 14–25 mm long, shorter than throat, the throat funnelform, 20–31 mm long, 7.5–13 mm in diameter near midpoint, the limb 27–52 mm in diameter with lobes subcirculate to broadly elliptic, 10–19 mm long, 11–18.5 mm wide. Stamens inserted at base of throat, included, didynamous, the shorter pair 10–13 mm long, the longer pair 15–18 mm long, the thecae 4–5 mm long. Style 30–35 mm long, sparsely pubescent (at least along proximal portion and usually along distal portion) with glandular trichomes to 0.2 mm long and sometimes with antrorse, eglandular trichomes as well; stigmatic lobes unequal with one 2–2.5 mm

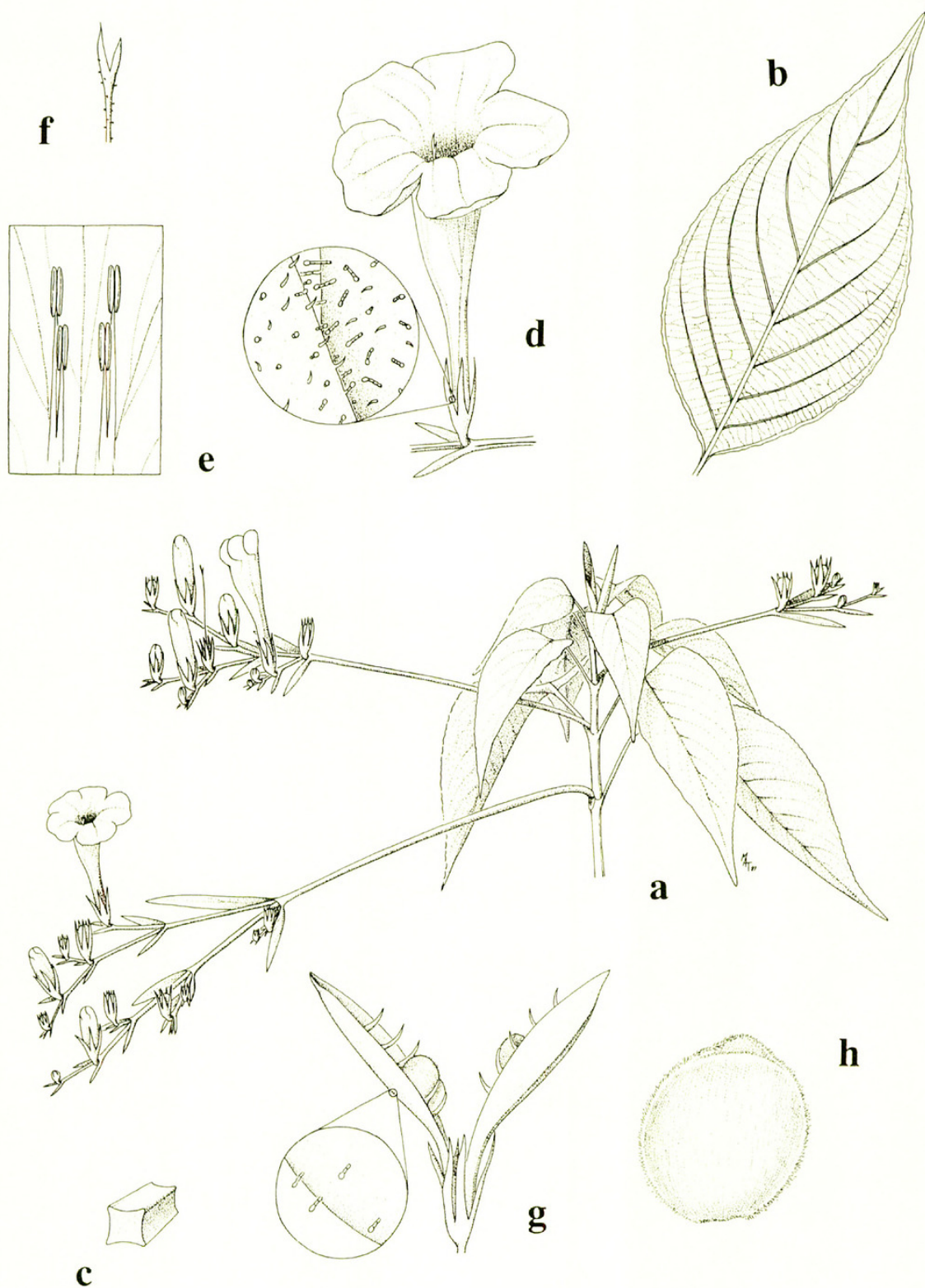


FIG. 4. *Ruellia breedlovei* (Daniel & Bartholomew 5025). a. Distal portion of shoot with inflorescences, $\times 0.33$. b. Leaf, $\times 0.6$. c. Segment of rachis, $\times 5$. d. Bractlets and flower with enlargement showing pubescence of calyx and corolla; flower $\times 0.85$, enlargement $\times 19$. e. Androecium from cut-open corolla, $\times 1.2$. f. Distal portion of style and stigma, $\times 3$. g. Opened capsule with enlargement of surface showing trichomes; capsule $\times 1.7$, enlargement $\times 17$. h. Seed, $\times 7$.

long and the other 0.6–1 mm long. Capsule clavate, 17–24 mm long, pubescent (at least near apex) with glandular trichomes 0.05–0.2 mm long, the stipe 5–7 mm long, the head 12–16 mm long. Seeds 12–16 per capsule, subcirculate, 3.5–4 mm long, 2.5–3.7 mm wide, the surfaces glabrous, the margin fringed with papillose (when dry), hygroscopic trichomes.

Distribution and habitats. Known only from limestone ridges in the Central Depression of Chiapas in southern Mexico (Fig. 3). The plants occur in regions of tropical deciduous and subdeciduous forests (with *Achras*, *Capparis*, *Ceiba*, *Diospyros*, *Erythrina*, *Hauya*, *Lucuma* and *Tabebuia*) at elevations from 600 to 1450 m.

Phenology. Flowering and fruiting August to May.

Vernacular name. “Quiebramuelas” (*Palacios E.* 200) or “Quiebra muela” (*Palacios E.* 7).

PARATYPES. MEXICO. Chiapas: Mpio. Tuxtla Gutiérrez, 20 km N of Tuxtla, *Breedlove* 9046 (DS, ENCB, MICH, US); Mpio. Ocozocoautla, Río de la Venta along Hwy 190, 12 mi W of Ocozocoautla, *Breedlove* 25215 (DS, ENCB, MICH); Mpio. Suchiapa, 15 km SW of Suchiapa along rd. to Villa Flores, *Breedlove* 28222 (CAS, ENCB); Mpio. Ocozocoautla, head of Río de la Venta at the Chorreadero near Derna, *Breedlove* 34324 (DS), 36573 (DS), 50473 (CAS, MEXU), *Breedlove & Thorne* 30315 (DS, ENCB); Mpio. Soconusco, 30 km ESE of Pucallila on rd. to Comitán, *Breedlove* 53667 (CAS), *Breedlove & Almeda* 56881 (CAS, ENCB); Mpio. Terán, 4 km N of Juan Crispín along rd. to San Fernando, *Breedlove & Thorne* 30392 (DS); El Aguacero, 13 km al NO de Ocozocoautla, *Cabrera & de Cabrera* 7859 (CAS); El Zapotal, parque zoológico de Tuxtla Gutiérrez, *Cowan* 5030 (CAS); Mpio. San Fernando, 4–6 km W of Mirador Los Chiapas in Parque Nac. del Sumidero, *Davidse et al.* 29731 (CAS, MEXU); between S. Fernando and Chalona, W of Tuxtla Gutiérrez, *Langman* 3834 (US); KM 19–22 de la carretera Tuxtla Gutiérrez–El Sumidero, *Martínez & Martínez* 6460 (CAS); El Cañón del Sumidero, *Martínez S. et al.* 8615 (MEXU); Encañada carretera a S. Fernando, *Miranda* 5143 (MEXU); Encañada carr. a Villaflores (SE Suchiapa), *Miranda* 6460 (MEXU), 6832 (CHIP); Mpio. Tuxtla Gutiérrez, Cañón del Sumidero National Park, *Neill* 5560 (CAS); Mpio. Tuxtla Gutiérrez, El Zapotal, *Palacios E.* 7 (CAS, CHIP), 200 (CAS).

Numerous collections of this species have been annotated with an unpublished name first suggested by Emory Leonard, the dean of American acanthologists. Indeed, the species represents an undescribed taxon endemic to Chiapas. It may be distinguished from other species of *Ruellia* with blue, glandular-pubescent corollas and long (more than 10 mm), eglandular peduncles in that state of Mexico by the following key:

1. Leaves lance-linear, 10–27.1 times longer than wide; seeds 16–20 per capsule.
R. brittoniana Leonard.
1. Leaves lanceolate to ovate to elliptic to deltate to cordate, 1.1–8.2 times longer than wide; seeds 8–16 per capsule.
 2. Flowers borne in long-pedunculate, eglandular dichasia from axils of proximal leaves and in \pm congested, glandular dichasia from axils of reduced distal leaves or bracts, the former dichasia often absent during later portions of season, the latter dichasia forming a terminal, leafy, paniculate thyse; bractlets of distal dichasia stipitate-glandular; leaves constricted-attenuate at base.
R. nudiflora (Engelm. & Gray) Urban.
 2. Flowers borne in long-pedunculate, eglandular dichasia from leaf axils, these not forming a terminal thyse; bractlets eglandular; leaves cordate to rounded to acute to attenuate to constricted-attenuate at base.
 3. Leaves somewhat coriaceous; abaxial surface of calyx glabrous or nearly so, the margin and adaxial surface pubescent with glandular and eglandular trichomes up to 0.2 mm long; corolla 35–40 mm long; capsule glabrous.
R. stemonacanthoides (Oerst.) Hemsl.
 3. Leaves membranaceous; abaxial surface of calyx pubescent with glandular and/or eglandular trichomes 0.05–0.5 mm long; corolla 45–71 mm long; capsule glandular-pubescent (at least near apex).

4. Leaves lanceolate, 4.0–8.2 times longer than wide, attenuate at base; inflorescence vertically ascending; calyx eglandular; corolla tube 28–32 mm long, longer than throat; capsule 13–14 mm long. *R. jussieuoides* Schlecht. & Cham.
4. Leaves ovate to broadly ovate to cordate, 1.4–3.1 times longer than wide, acute to rounded to cordate at base; inflorescence horizontally spreading; calyx glandular; corolla tube 14–25 mm long, shorter than throat; capsule 17–24 mm long. *R. breedlovei*.

Most specimens of *R. breedlovei* have glabrous internodes. *Breedlove 9046* comprises a sprig with glabrous internodes and others with more or less densely pubescent internodes. The latter likely represent a more pubescent form of the species.

It is a pleasure to name this showy species in honor of my colleague Dennis Breedlove, authority on the flora of Chiapas and prolific collector of this and many other species of Acanthaceae.

NEW AND HERETOFORE CONFUSED SPECIES WITH SESSILE, PATELLIFORM GLANDS, SESSILE TO SUBSESSILE FLOWERS OR INFLORESCENCES, AND WHITE, PINK, OR RED COROLLAS

Mexican species of *Ruellia* exhibit a wide array of floral forms and colors. Although most North American species have blue and infundibular corollas, white, pink, red, greenish, and yellow corollas with various forms are not uncommon. A distinctive assemblage of Mexican species of *Ruellia* possesses sessile, patelliform glands on various vegetative and/or reproductive structures, flowers either solitary and sessile to subsessile or arranged in sessile to subsessile dichasial clusters, and more or less tubular to narrowly infundibular, white, pink, or red corollas. Two Mexican taxa in this complex of species are newly described and the taxonomy of three others is clarified below.

The sessile glands appear as small, circular, and dark or glistening punctations on the epidermis under a hand-lens or dissecting microscope. Leonard (1951) referred to them as minute glandular scales, dots, or pits. The scanning electron microscope reveals them to be patelliform in shape (Fig. 2 a–c). Eglandular and/or stipitate glandular trichomes may overtop them. Identical glands can be found in distantly related Mexican species of *Ruellia* with blue, infundibular corollas [e.g., *R. hookeriana* (Nees) Hemsley] and with yellowish to whitish, saccate corollas (e.g., *R. petiolaris*).

The pink-to red-flowered species of *Ruellia* treated here possess corollas that have a narrow tube that gradually expands into a rather poorly distinguished throat. In features of color, size, and configuration, corollas of these species are similar to those of *R. humboldtiana* (Nees) Lindau of Panama and northern South America. Notes on a specimen (*Skinner 10*, DUKE) of this species from Venezuela reveal that the flowers are pollinated by phaethornine hummingbirds (especially *Glaucis hirsuta* and *Phaethornis anthophilous*). Although neither of these species occurs in Mexico (Johnsgard 1983) it is likely that the Mexican species of *Ruellia* with tubular to narrowly infundibular, pink to red corollas are also pollinated by hummingbirds. The shorter, often more vertically oriented, and white corollas with a clearly differentiated tube and throat and a rotate limb of *R. foetida* differ considerably from those of the species with pink to red flowers. Vegetatively, however, *R. foetida* greatly resembles these latter species. Corollas of *R. foetida* likely are adapted for butterfly or moth pollination.

Lindau (1895) assigned South American relatives of the species under consideration here to "Euglandulosae" (a taxon without indication of rank) in his section *Physiruellia*. Because subgeneric taxa in the genus were inadequately defined by Lindau and are still in need of considerable study on a worldwide basis, none of species considered below is assigned to a subgeneric taxon.

Mexican species with sessile, patelliform glands on the epidermis of at least some vegetative and/or reproductive structures, sessile to subsessile solitary flowers or inflorescences, and white, pink, or red tubular to narrowly infundibular corollas, can be distinguished by the following key:

1. Stems glabrous; corolla white, 23–35 mm long, the limb rotate, 13–26 mm in diameter with lobes 5–10 mm long; thecae 1.8–2.5 mm long; style 19–23 mm long. *R. foetida*.
1. Stems pubescent with eglandular (and sometimes stipitate glandular) trichomes; corolla pinkish or reddish, 40–83 mm long, the limb spreading to reflexed, 21–53 mm in diameter with lobes 8.5–25 mm long; thecae 2.7–5 mm long; style 35–80 mm long.
2. Young stems, leaves, calyx, corolla, and capsule pubescent with eglandular and stipitate glandular trichomes; calyx actinomorphic with lobes linear to linear-elliptic to oblanceolate, 1.5–2.8 mm wide. *R. megasphaera*.
2. Young stems, leaves, calyx, corolla, and capsule pubescent with eglandular trichomes only; calyx actinomorphic with lobes subulate, 0.7–1.3 mm wide or zygomorphic with 2 pairs of lobes united for ½ or more of their length.
3. Corolla dark pink, 40–57 mm long, lacking sessile, patelliform glands on external surface, throat 5–10 mm long; thecae 2.7–3.5 mm long; style 43–45 mm long. *R. amoena*.
3. Corolla red, 60–83 mm long, with sessile, patelliform glands on external surface, throat 10–27 mm long; thecae 4–5 mm long; style 60–80 mm long.
4. Flowers sessile or borne on pedicels up to 1 mm long; calyx zygomorphic with two pairs of lobes united for ½ or more of their length, remaining lobe lance-subulate; corolla 70–83 mm long; stamens 24–36 mm long. *R. novogaliciana*.
4. Flowers borne on pedicels 3–8 mm long; calyx actinomorphic, deeply 5-lobed, lobes subulate; corolla 60–74 mm long; stamens 15–24 mm long. *R. mcvaughii*.

Ruellia foetida Willd., Enum. plant. 656. 1809.—TYPE. MEXICO. Guerrero: near Acapulco, *Humboldt & Bonpland s.n.* (holotype: B-W #11632, microfiche US!; isotype: P-HBK!).

Ruellia albiflora Fernald, Proc. Amer. Acad. Arts 33: 92. 1897.—TYPE. MEXICO. Guerrero: Acapulco, Oct 1894–Mar 1895, *Palmer 49* (lectotype, designated here: US!; isoelectotypes: BM! F! GH, K! MIN! NY! UC! US!).

Subshrub to shrub to 2 m tall. Young stems subquadrate, often covered with sessile, patelliform glands, otherwise glabrous, blistery. Leaves petiolate, the petioles to 25 mm long, the blades lance-ovate to ovate-elliptic, 30–180 mm long, 15–73 mm wide, 2.3–3.9 times longer than wide, attenuate at base, acute to acuminate at apex, the surfaces covered with sessile, patelliform glands, otherwise glabrous, the margin entire, flat to subundulate, minutely ciliate. Flowers sessile or short (to 1.5 mm) pedicellate, borne in dichasia (usually reduced to a single flower) from axils of distal leaves or often in congested, leaflike bracts which often form dense, spikelike axes with rachises pubescent (sometimes sparsely so) with eglandular (and sometimes stipitate-glandular) trichomes up to 0.1 mm long (minutely puberulent). Bracts petiolate, lance-ovate to lance-elliptic, 15–27 mm long, 3–9 mm wide, minutely puberulent and covered with sessile, patelliform glands. Bractlets (sometimes absent) oblanceolate to spatulate to linear, 6–18 mm long, 0.3–3 mm wide, pubescent like bracts; secondary bractlets, if present, smaller than bractlets. Calyx 5–11 mm long, accrescent (up to 13 mm long) in fruit, the tube 2–5 mm long,

shorter to longer than lobes, the lobes subulate, 2–8 mm long, 0.7–1.1 mm wide, the abaxial surface pubescent like bracts, the adaxial surface pubescent with antrorsely appressed eglandular trichomes. Corolla white, 23–35 mm long, externally covered with sessile, patelliform glands and pubescent with flexuose eglandular trichomes 0.1–0.3 mm long, the tube 13–20 mm long, the throat 5–8 mm long, 3.5–5 mm in diameter near midpoint, the limb rotate, 13–26 mm in diameter with lobes subcirculate to elliptic, 5–10 mm long, 5–7.5 mm wide. Stamens inserted at base of throat, exerted, didynamous, the shorter pair 6.5–10 mm long, the longer pair 8–11.5 mm long, the thecae 1.8–2.5 mm long. Style 19–23 mm long, pubescent; stigmatic lobes unequal with one 1.2–1.5 mm long and the other 0.2–0.7 mm long. Capsule clavate, 10–13 mm long, pubescent with retrorse-appressed eglandular trichomes 0.05–0.1 mm long, the beak with sessile, patelliform glands, the stipe 3.5–5 mm long, the head 6–8 mm long. Seeds 4 per capsule, subcirculate to subelliptic, 3–4 mm long, 2.5–3 mm wide, the surfaces covered with appressed, hygroscopic trichomes.

Distribution and habitats. West-central to southwestern Mexico (Nayarit, Jalisco, Colima, Guerrero, and Oaxaca) from near sea level to 1060 m (Fig. 5). Plants occur on slopes and in disturbed areas in regions of tropical deciduous and subdeciduous forest (with *Brosimum*, *Bursera*, *Caesalpinia*, *Cassia*, *Cordia*, *Croton*, *Guaiacum*, *Hura*, *Ipomoea*, *Lysiloma*, *Orbignya*, and *Zizyphus*) and oak forest.

Phenology. Flowering and fruiting October to May.

Vernacular name. “Tronador” (Villanueva O. s.n., Pérez J. 25, Herrera C. 36, M. Ochoa F. s.n.) or “tronadora” (Hinton et al. 11564).

REPRESENTATIVE SPECIMENS. MEXICO. Colima: 4.8 mi NW of Puente Miramar near Santiago, Daniel 2108 (ASU); Río Salado along Hwy 110, 3.3 mi E jct. 110 to Manzanillo in Colima, Daniel 2142 (ASU);

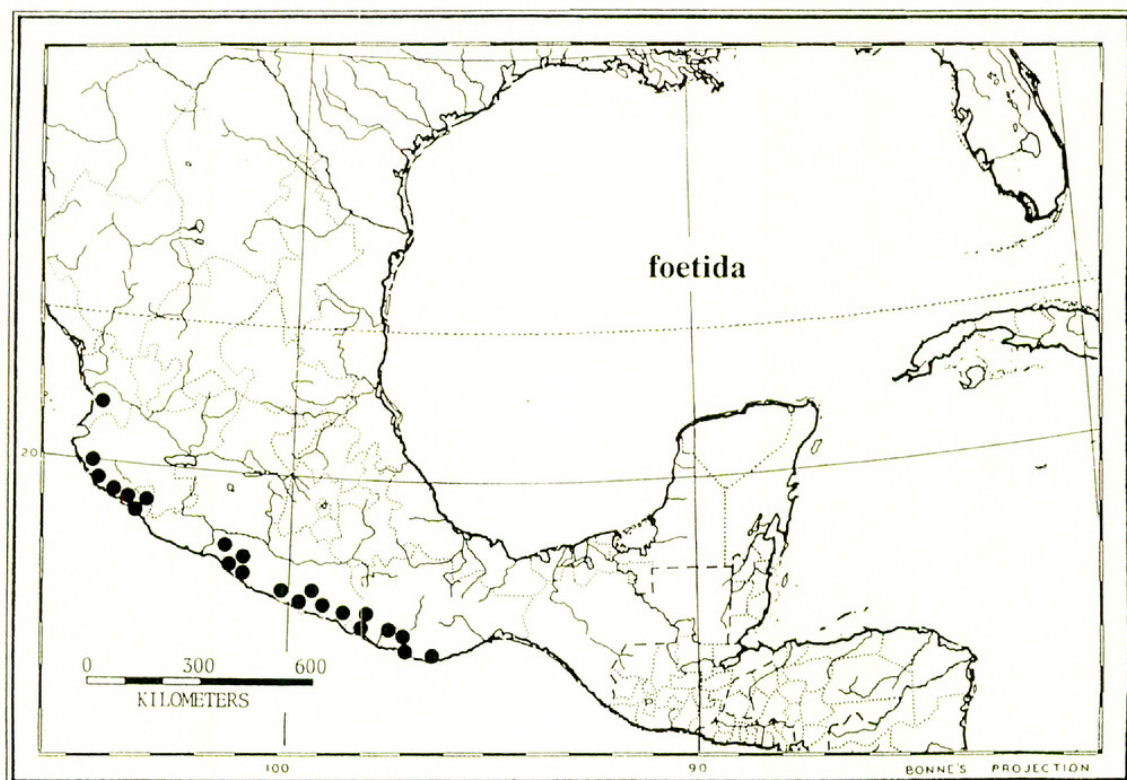


FIG. 5. Distribution of *Ruellia foetida*.

rd to Río Cihuatlán, N of Playa Santiago, *Koelz 34241* (ENCB, MICH); ca. 7 km N of Santiago, *McVaugh 24979* (MICH); Armeria, *Palmer 1274* (BM, G, K, UC, US).—Guerrero: Acapulco, *Barclay 1954* (BM), *s.n.* (K); near turnoff to Pie de la Cuesta NW of Acapulco, *Barkley 14169* (CAS, MEXU); between Tierra Colorado and bridge over Río Comitlán, *Croat 45752* (CAS); 1.3 km NE Hwy 200 along Hwy 134 between La Salitrera and Coyuca de Catlán, *Daniel 5325* (CAS, K, MEXU, MICH, MO); along Hwy 134 between La Salitrera and Coyuca de Catlán, 9.6–11.8 km SW of Vallecitos de Zaragoza, *Daniel 5329* (CAS); between Petatlán and Camalotito, 9.8 km SW of Camalotito, *Daniel & Bartholomew 4923* (CAS, MEXU); Acapulco, *Haenke 1661* (F); Mpio. Cuautepec, San Agustín Cuilutla, *Herrera C. 36* (MEXU); Distr. Montes de Oca, Vallecitos, *Hinton 9906* (K, US), *Hinton et al. 11564* (K, US); Distr. Galeana, Plato, *Hinton et al. 14995* (ENCB, US); El Ocote, *Langlássé 620* (G, K, P, US); Acapulco, *Née s.n.* (F); Mpio. Atoyac de Alvarez, al N de Ejido Quemado, *Ochoa F. s.n.* (MEXU); vicinity of Acapulco, *Palmer 49* (BM, UC, US); Juchitán, *Rzedowski 29747* (CAS, ENCB, MICH); Acapulco, *Sinclair s.n.* (K); Mpio. Acapulco, La Venta, *Villanueva O. s.n.* (DS, ENCB); ca. 5 mi W of Acapulco on rd to Pie de la Cuesta, *Webster & Breckon 16226* (CAS).—Jalisco: above Bahía Chamela, ca. 10 km N of Chamela, *Anderson & Anderson 6144* (ENCB, MICH); Mpio. Cihuatlán, 0.5 mi S of Ejido El Rincón toward Melaque, *Arias et al. 47* (CAS); 5–15 mi N of Tomatlán, *Daniel 2081* (ASU, CAS, DUKE, K, MEXU), *2091* (ASU, CAS, MEXU, MICH, MO), *2088* (ASU); hill above Playa Cuastecomate at N end of Melaque, *Daniel & Bartholomew 4879* (CAS, NY); a 11 km de B. de Navidad via Guadalajara, *Delgadillo M. 47* (MEXU); near Tomatlán, *Gentry & Gentry 23544* (DES, MICH, US); Mpio. La Huerta, Chamela, *Magallanes 4342* (CAS); 2–6 km SE of La Manzanilla, above Bahía Tenacatita on rd to Melaque, *McVaugh 25046* (MICH); 9–11 km E of Chamela, *McVaugh 25190* (MICH); ca. 7 mi S of Tomatlán toward Manzanillo-Puerto Vallarta rd, *McVaugh 26306* (MICH); 9 mi N of rd junction at W end of Bahía de Navidad along hwy to Autlán, *McVaugh & Koelz 1733* (MICH); Chamela Biological Station, Chachalaca Trail, *Miller et al. 407* (CAS); Chamela, *Pérez J. 25* (CAS, MEXU); Est. Biol. Chamela, *Pérez S. 7* (CAS, MEXU), *261* (CAS, MEXU); 1 km SW de Tomatlán *Rzedowski 17773* (ENCB, MICH); Mpio. La Huerta, brecha la Manzanilla-playa del Tamarindo, *Villareal de Puga & Carvajal H. 9747* (ENCB).—Nayarit: Tepic, *Beechey s.n.* (K).—Oaxaca: Distr. Juquila, *Conzatti 4377* (US); Distr. Pochutla, Boquerón, camino de Fonameca, *Conzatti et al. 3271* (US); along Hwy 131 between Puerto Escondido and Sola de Vega, 22.4 km N jct. Hwy 200, *Daniel 5375* (CAS); between Pochutla and summit, near Puerto Angel, *Ernst 2643* (MEXU, US); Pinotepa, *Galeotti 5101* (BR, GH, NY, US); Mpio. Pochutla, 1–2 km O de Puerto Angel, *Koch & Fryxell 78404* (CAS, CHAPA, ENCB, MEXU, US); Guatulco, *Liebmann s.n.* (G, K, P); Playa de S. Agustín, *Liebmann s.n.* (K, US); Mpio. Putla, Puente de la Pastora, 2 km S of Cacahuatpec, *McVaugh 22217* (ENCB, MICH); Puerto Angel, *Morton & Makrinius 2625* (F, US), *2640* (K, US); near Pochutla, *Reko 3510* (US); near Puerto Angel, *Wiggins & Porter 54* (US).

Nees (1847) placed *R. foetida* into the synonymy of *Dipteracanthus rubicaulis* (Cav.) Nees (in the supplement he referred this taxon to *Stemonacanthus*) and Hemsley (1882) included *R. foetida* in the synonymy of *R. rubicaulis* Cav. The plant, described and figured by Cavanilles (1799) from Querétaro, is reported to have reddish stems, crenate leaves, and bluish corollas. *Ruellia foetida* is not known from northeastern Mexico and has green, brown, or whitish stems, entire leaves, and white corollas. Furthermore, the capsule illustrated by Cavanilles is ellipsoid, whereas capsules of *R. foetida* are clavate. There is a specimen at F from a plant cultivated in Madrid from Mexican stock labelled as *R. rubicaulis* Cav. The specimen greatly resembles Cavanilles's plate of *R. rubicaulis* and has glabrous, ellipsoid capsules, flowers in axillary dichasia, and calyx lobes with stipitate glands. None of these features is found in specimens of *R. foetida*.

Most specimens of this species have been identified with the name *R. albiflora*. In the protologue of this species, Fernald (1897) cited two collections, *Palmer 49* and *Palmer 1274*. Although he did not indicate either of these as the type, his publication deals with plants collected at Acapulco by Palmer. *Palmer 1274* was collected in Colima and mentioned somewhat incidentally by Fernald. Because Fernald's intention was clear and because *Palmer 49* agrees with his description, this collection is chosen as the type. *Ruellia albiflora* completely resembles the type

of *R. foetida*, which was also collected near Acapulco. Therefore, the name of the former species is relegated to the synonymy of the latter.

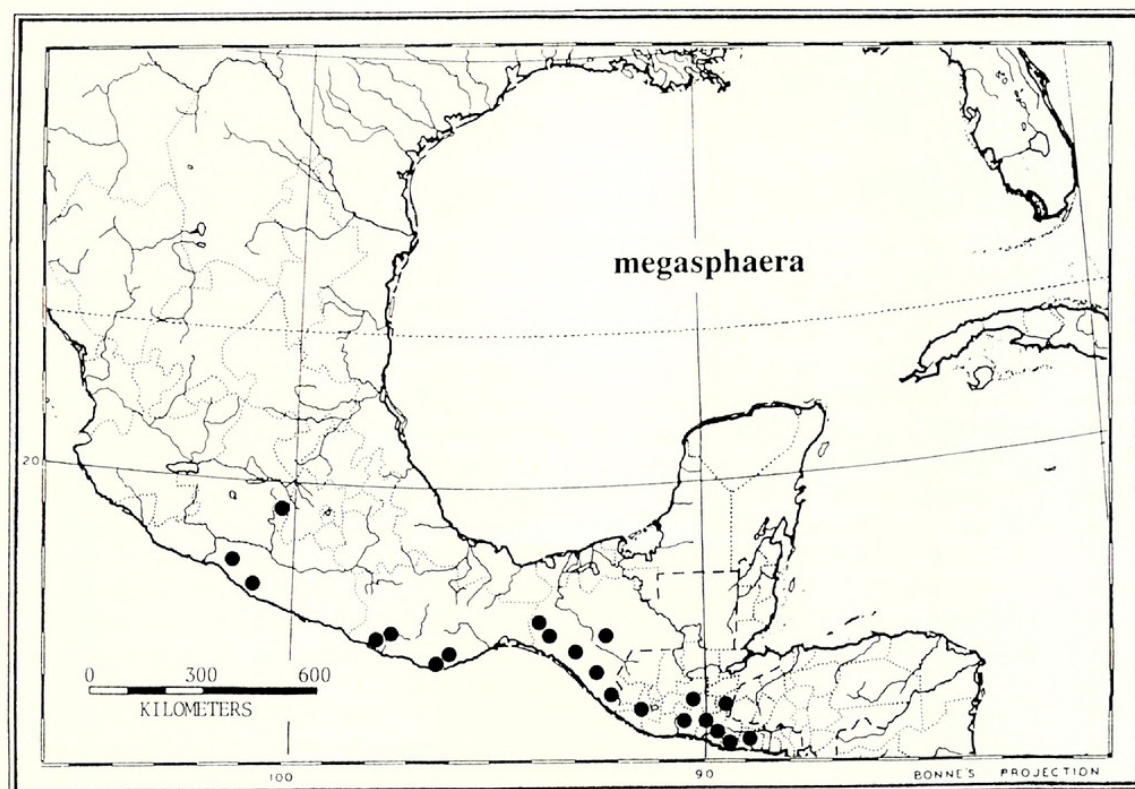
Ruellia megasphaera Lindau, Bull. Herb. Boissier 3: 364. 1895.—TYPE. MEXICO. Without locality, *Ehrenberg 1268* (holotype: B, destroyed).

Shrub to 1 m tall. Young stems quadrate, at first evenly pubescent with a mixture of straight to subflexuose, glandular and eglandular trichomes 0.3–1 mm long (glandular-pubescent), soon becoming puberulent with straight to antrorse, mostly eglandular trichomes 0.05–0.2 mm long. Leaves petiolate, the petioles to 45 mm long, the blades ovate to elliptic, 35–150 mm long, 9–75 mm wide, 2.0–4.7 times longer than wide, subattenuate to attenuate at base, acuminate at apex, the surfaces covered with sessile, patelliform glands and glandular-pubescent, the margin entire to subcrenate, flat. Flowers solitary, sessile or borne on short (to 3 mm long) pedicels in axils of distal leaves and leaflike bracts which form terminal, branched, headlike clusters. Bracts petiolate, ovate to lance-ovate, 18–48 mm long, 4–19 mm wide, covered with sessile, patelliform glands and glandular-pubescent. Bractlets absent. Calyx 10–18 mm long, the tube 1–3 mm long, the lobes linear to linear-elliptic to oblanceolate, subequal, 7.5–15 mm long, 1.5–2.8 mm wide, the abaxial surface covered with sessile, patelliform glands and glandular-pubescent, the adaxial surface glandular-pubescent. Corolla dark pink to orange-red to red, 45–67 mm long, externally glandular-pubescent, the tube 17–32 mm long, longer than and gradually ampliate into a funnelform throat 15–22 mm long, 5.5–8.5 mm in diameter near midpoint, the limb 21–35 mm in diameter with lobes linear-elliptic to elliptic to ovate, 8.5–17 mm long, 4.2–7 mm wide. Stamens inserted at base of throat, exerted, equal in length to subdidynamous (i.e., with one pair to 1.5 mm longer than the other), 24–30 mm long, the thecae 3.5–5 mm long. Style 35–40 mm long, pubescent; stigmatic lobes unequal with one 1.7–2 mm long and the other 0.2–1 mm long. Capsule ellipsoid, 11–16 mm long, glandular-pubescent, the stipe 1.5–2 mm long, the head 9.5–14 mm long. Seeds 6–8 per capsule, subcirculate to subelliptic, 2.9–3.7 mm long, 2.7–3 mm wide, the surfaces covered with appressed, hygroscopic trichomes.

Distribution and habitats. Southern Mexico (Michoacán, Guerrero, Veracruz, Oaxaca, and Chiapas), Guatemala, and El Salvador (Fig. 6). Plants occur from 300–3000 m and are commonly encountered in pine-oak forests.

Phenology. Flowering December to June; fruiting January to May.

ADDITIONAL SPECIMENS EXAMINED. EL SALVADOR. Ahuachapán: vicinity of Ahuachapán, *Standley 19968* (US). San Salvador: vicinity of Ayutuxtepéque, *Standley 20498* (GH, US). Sonsonate: Nahuizalco, *Pittier 1967* (US).—GUATEMALA. Chiquimula: El Guanacaste, beyond Concepción on rd from Chiquimula to Metapán, *Pittier 1897* (US). Escuintla: Finca Concepción, *Johnston 525* (F), 553, (F); Río Guacalate, *Standley 60184* (F); near Escuintla, *Standley 63935* (US); San Antonio Jute, *Standley 64885* (F, US); barranca of Río Gavilán, NE of Escuintla, *Standley 89551* (F, US). Guatemala: F.N. "La Aurora," *Aguilar 452* (F). Retalhuleu: along Río Samala, on rd between San Sebastián and Sta. Cruz Mulua, *Standley 88160* (F, US). Santa Rosa: Volcán Tecuamburro, N of Chiquimulilla, *Steyermark 33172* (F).—MEXICO. Chiapas: rd to Villa Flores, 0.6 mi E of "Entronque Santa Isabel," which is 22 km N of Arriaga, *Anderson & Anderson 5568* (ENCB, MICH); Mpio. Cintalapa, 23 km W of La Cruces along rd to La Mina Microwave Station, *Breedlove 56280* (CAS, ENCB); Mpio. Angel Albino Corzo, just N of Finca Cuxtepec, *Breedlove & Almeda 57021* (CAS, MEXU); Mpio. Venustiano Carranza, near Rancho Carmen along rd from Acala to Venustiano Carranza, *Laughlin 3013* (DS, US); Mt. Ovando, *Matuda 124* (MEXU, MICH, US); Azulejo, Margarita, *Matuda 18747* (DS); Rancho Linda Vista (24 km E Villaflores), *Miranda 5972* (CHIP); near Huehuetán, *Nelson 3826* (US); near Monserrate, *Purpus 144*

FIG. 6. Distribution of *Ruellia megasphaera*.

(US). Guerrero: Distr. Montes de Oca, Vallecitos, *Hinton et al.* 10195 (K, US), 11756 (K, US), 14116 (F, US); Sierra Madre (vicinity of Río Coyuquilla), *Langlassé* 913 (G, K, P, US). Michoacán: Distr. Zitácuaro, Zitácuaro-Cacique, *Hinton et al.* 11934 (K). Oaxaca: without locality, *Alexander* 452 (MEXU, MICH, US); Distr. Juquila, del Ahuacac a Juquila, *Conzatti* 4533 (US); Sierra Pluma, *Diguet s.n.* (P); between Pochutla and summit (near Puerto Angel), *Ernst* 2651 (MEXU, US); without locality, *Ghiesbreght s.n.* (P); from Juquila to Tututepéque, SSW of Oaxaca, *Jurgensen* 67 (G, OXF); Mpio. Candelaria Loxicha, 3 km N de Candelaria Loxicha, *López F. et al.* 562 (MEXU); Distr. Pochutla, vicinity of Concordia, *Makrinius* 673 (US), 734 (US); vicinity of Cafetal Concordia, *Morton & Makrinius* 2376 (DS, F, K, MICH, US); from Río Verde to Panixtlahuaca, *Nelson* 2386 (US). Veracruz: Medellín, *Hahn* 123 (P). Without state: without locality, *Galeotti* 510Q (BR, US); Nueva España, *Sessé et al. s.n.* (F, G, OXF).

Gibson (1974) referred this species to *Ruellia parva* (Nees) Hemsley (based on *Ophthalmacanthus parvus* Nees) and included *R. megasphaera* in the synonymy of that species. The holotype (*Karwinski s.n.* in hb. Martius at BR; collected near Teojomulco which is south of Cd. Oaxaca in southern Mexico; see McVaugh 1980a for a summary of Karwinski's itineraries in Mexico) and description of *Ophthalmacanthus parvus* (Nees 1847) reveal this species to have shorter (up to 41 mm long), blue corollas and small (up to 16 mm long), ovate leaves. Although capsules are not now present on the holotype of *O. parvus*, Nees (1847) noted that they are glabrous and 12–16 seeded. In the species treated here as *R. megasphaera*, the capsules are glandular-pubescent and contain 6–8 seeds.

It is understandable why Gibson, who worked at F, equated *R. megasphaera* with *R. parva*. At F (and at US), there is a photograph of a Karwinski (*s.n.*) collection at W, labelled as a type of *Ophthalmacanthus parvus*. This specimen, presumably an isotype, indeed appears to be *R. megasphaera*. In fact, it must represent another of Karwinski's collections or part of a mixed collection excluded from the holotype at BR.

Specimens of this species collected by the Sessé and Mociño expedition to Mexico were originally identified as either *R. ciliaris* or *R. sp. nov.* (The name *R. ciliaris* Sessé & Mociño, based on plants from Apatzingán, Michoacán, with violet corollas, apparently does not apply to specimens in the Sessé and Mociño herbarium under that name.)

I use the name *R. megasphaera* for this taxon with some hesitation. Although I have seen no type material, the description in the protologue conforms rather well to this taxon in those characters given. The plants cited above differ from Lindau's description by their quadrate (vs. terete) young stems, entire (vs. occasionally subcrenate) leaves, and fewer and larger seeds (6–8 vs. 12 per capsule; 3.7 mm long, 2.7–3 mm wide vs. 2 mm in diameter). Corolla color was not provided by Lindau (1895). I have been unable to locate any collections annotated by Lindau with this name. He identified the collection of Sessé and Mociño at G as an undetermined species with affinities to *R. pulcherrima* T. Anders. ex Hemsley. Unfortunately he did not provide the date of his annotation. Interestingly, in his protologue of 1895, Lindau described *R. megasphaera* in section *Dipteracanthus* and compared it to *R. speciosa* (Nees) Lindau, a name based on the same type as *R. pulcherrima*. Unfortunately, in 1898, Lindau annotated *Jurgensen 67* at G as an undetermined species of section *Physiellia*. Leonard identified numerous specimens of this species as *R. megasphaera*.

Ehrenberg's type collection was presumably destroyed at B in 1943 (fide Th. Raus, in litt.), and I have been unable to locate either isotype material or photographs of the holotype. Most of Ehrenberg's collections are from Hidalgo, from which state this species is not known to occur. Urban (1897) noted, however, that Ehrenberg also collected in Veracruz, where the species is known to occur.

Plants of *R. megasphaera* superficially resemble those of *R. amoena*, *R. mcvaughii*, and *R. novogaliciana*. All are shrubs with similarly colored and shaped corollas. *Ruellia megasphaera* can be readily distinguished from them by the presence of stipitate glands on young stems and leaves, corollas, and capsules (vs. stipitate glands absent on these structures) and calyx lobes linear to oblanceolate (vs. subulate for all but the two pair of fused lobes in *R. novogaliciana*), 2.5–2.8 mm wide (vs. 0.7–1.5 mm wide for all but the two pair of fused lobes in *R. novogaliciana*). It differs further from *R. amoena* by the ellipsoid (vs. clavate) capsules containing 6–8 (vs. 4) seeds. In these characters of the fruit, it more closely resembles the two new species. Although there is some overlap in range, *R. megasphaera* tends to occur to the south of the other pink- to red-flowered species under consideration here.

Ruellia amoena Sessé & Mociño, Pl. Nov. Hisp. 100. 1889, non *R. amoena* Nees in DC, 1847, pro syn.—TYPE. Fl. Mex. Ic. 419 (erroneously cited as 414 in Pl. Nov. Hisp., but correctly cited in the manuscript of that work fide McVaugh 1980b), illustration preserved at Hunt Institute for Botanical Documentation in Pittsburgh (lectotype designated here; original illustration not seen, but verified by a colored slide of the illustration sent from the Hunt Institute).

Shrub to 2.5 m tall. Young stems subquadrate to quadrate, more or less evenly pubescent with straight to flexuose, eglandular trichomes 0.05–1 mm long and the youngest portions often with sessile, patelliform glands as well, the mature portions glabrate and sometimes blistered. Leaves petiolate, the petioles to 37 mm long, the blades ovate-elliptic to elliptic, 22–145 mm long, 10–63 mm wide, 2.2–3.5 times longer than wide, acute to subattenuate at base, acute to acuminate at apex, the

surfaces covered with sessile, patelliform glands (especially on abaxial surface) and pubescent with cauline type trichomes, the margin entire, flat. Flowers solitary, sessile or short (to 1 mm) pedicellate in the axils of leaflike bracts in terminal spikelike axes, the rachis pubescent like young stems. Bracts petiolate, (lanceolate to) ovate to ovate-elliptic, 13–35 mm long, 4.5–14 mm wide, pubescent like leaves and with scattered, stipitate glandular trichomes 0.05–0.2 mm long. Bractlets usually absent, when present oblanceolate, 4–10 mm long, 0.7–2.5 mm wide, pubescent like bracts. Calyx 4–7 (–9.5) mm long, the tube 2–3.5 mm long, shorter to longer than lobes, the lobes subulate, 2–6 mm long, 0.7–1 mm wide, the abaxial surface covered with sessile, patelliform glands and pubescent with eglandular trichomes 0.05–0.4 mm long, the adaxial surface pubescent with antrorsely appressed eglandular trichomes. Corolla pink (white fide label data on *Hinton 16310*), 40–57 mm long, externally pubescent with straight to flexuose, eglandular trichomes 0.2–0.3 mm long, the tube 26–35 mm long, gradually ampliate into a poorly distinguished, funnelform throat 5–10 mm long, 6.5–10 mm in diameter near midpoint, the limb 23–33 mm in diameter with lobes elliptic to linear-elliptic, 9–16 mm long, 5.5–9.5 mm wide. Stamens inserted at base of throat, exerted, didynamous, the shorter pair 11–17 mm long, the longer pair 12–18.5 mm long, the thecae 2.7–3.5 mm long. Style 43–45 mm long, eglandular-pubescent; stigmatic lobes unequal with one 1.2–1.8 mm long and the other 0.5–1.2 mm long. Capsule clavate, 11–14 mm long, covered with sessile, patelliform glands (at least near apex) and pubescent with eglandular trichomes 0.05–0.1 mm long, the stipe 4–6 mm long, the head 7–9 mm long. Seeds 4 per capsule, subcirculate, 3.5–4.5 mm long, 3.0–3.9 mm wide, the surfaces covered with appressed, hygroscopic trichomes.

Distribution and habitats. Coastal slopes of west-central Mexico (Jalisco, Colima, Michoacán, and Guerrero) from near sea level to 875 m (Fig. 7). Plants

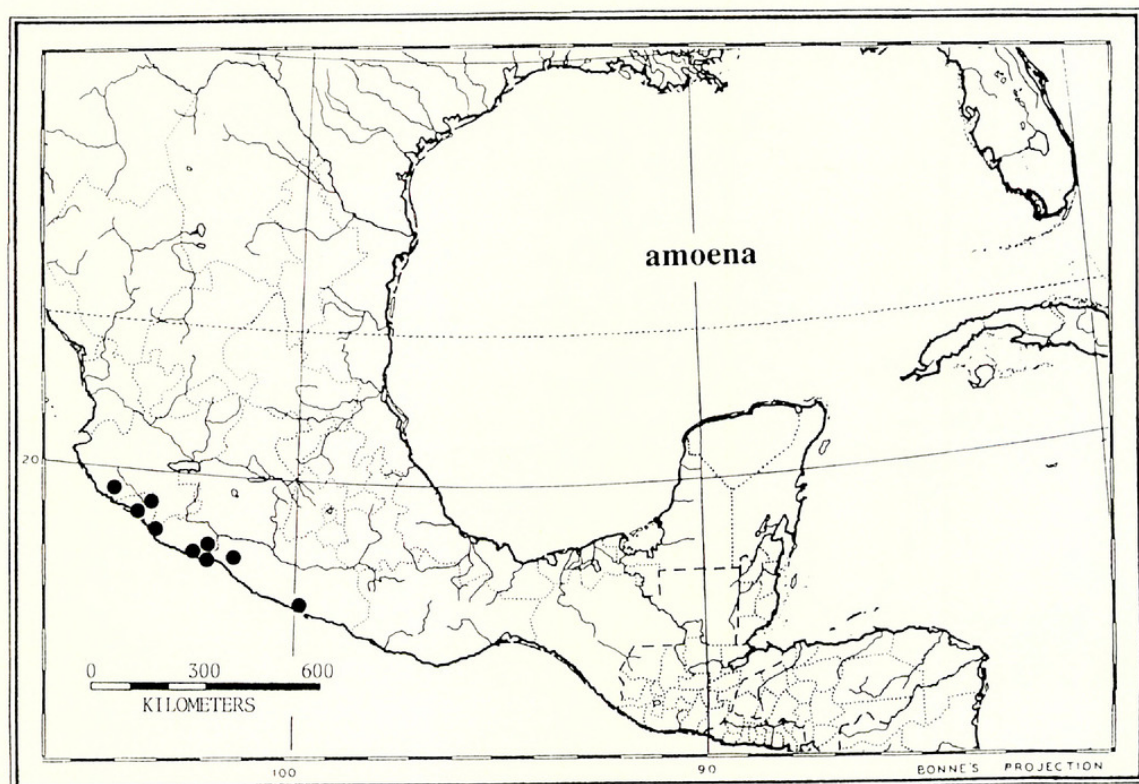


FIG. 7. Distribution of *Ruellia amoena*.

occur in woods and along watercourses in regions of tropical deciduous and subdeciduous forest (with *Acacia*, *Astronium*, *Bombax*, *Bursera*, *Caesalpinia*, *Ceiba*, *Cyrtocarpa*, *Juliania*, *Pseudosmodingium*, and *Tabebuia*) and evergreen forests (with *Bravaisia*, *Brosimum*, and *Orbignya*). Plants are often common weeds in naturally or artificially disturbed areas.

Phenology. Flowering and fruiting November to June.

Vernacular names. "Chuparosa" (Hill 60); "tronadora" (Hinton et al. 11727).

ADDITIONAL SPECIMENS EXAMINED. MEXICO. Colima: Río Salado along Hwy 110, 3.3 mi E jct. Hwy 110 to Manzanillo in Colima, *Daniel et al.* 3287 (ASU, CAS, K, MEXU); 9 km SE of Colima, Río Salado, *Langman* 3185 (US); Mpio. Ixtlahuacán, 2 km NE de Ixtlahuacán, *Lott & Magallanes* 834 (ASU, CAS); 5 mi S of Colima above Río Salado, *McVaugh & Koelz* 1100 (ENCB, MICH); Armeria, *Palmer* 1286 (BM, K, NY, US), 1287 (BM, G, K, NY, UC, US).—Guerrero: Acapulco, *Barclay* 1954 (US); Mpio. La Unión, "El Limón," camino La Salada-Infiernillo, *Campos R.* 1368 (MEXU); Distr. Montes de Oca, Vallecitos, *Hinton et al.* 11727 (G, GH, UC, US); delta de las Balsas, *Langlassé* 204 (G, K, P); La Lagunilla, *Nelson* 7003 (US).—Jalisco: Mpio. La Huerta, 5 km O de La Huerta, *Magallanes* 2742 (CAS); along rd from Barra de Navidad to Tequezquitlán, Concepción, and Autlán, 17 mi N of Navidad, *McVaugh* 11901 (MICH, US); 3–6 km S of La Huerta, *McVaugh* 23048 (ENCB, MICH); 6 km S of La Huerta on Mex. 80, *Neill* 5324 (MEXU); ca. 3 mi NW of La Huerta at Río de la Purificación, *Spellenberg* 6430 (MEXU, NMC, US); between La Huerta and Barra de Navidad, *Templeton* 9491 (MICH).—Michoacán: 5 km S of Arteaga on Hwy 37 to Playa Azul, *Daniel* 5319 (CAS, MEXU); along rd to Aquila, 10.2–11.2 km N of Hwy 200, *Daniel & Bartholomew* 4892 (CAS, MICH), 4895 (CAS); along rd between Aquila and Coalcomán, ca. 1.6 km N of Aquila, *Daniel & Bartholomew* 4901 (CAS, MEXU); along Hwy 37, 4 mi S of Arteaga, *Daniel & Butterwick* 3261 (ASU, CAS, DUKE, MICH, MO); Mpio. Aquila, ca. 2–3 km N of San Juan de Lima, ca. 20 km S of Coahuayana, *Feddema* 2742 (MICH); Mpio. Aquila, from Coahuayana to Ostula and S of Ostula, *Hill* 60 (MICH); Distr. Coalcomán, Aquila, *Hinton et al.* 12611 (K, US), 15826 (G, MICH, UC, US), 16174 (G, NY, US), 16287 (MICH, UC, US); Distr. Coalcomán, Ostula-Cofradia, *Hinton et al.* 16310 (ENCB, US); Mpio. Lázaro Cárdenas, 34 km al O de Playa Azul, *Koch & Fryxell* 83210 (CHAPA, US); ca. 40 km S of Arteaga and ca. 20 km N of Playa Azul, *McVaugh* 22552 (ENCB, MICH); S of Coahuayana, 3–6 km N of San Juan de Lima, *McVaugh* 23001 (ENCB, MICH); Chila, 8 km NW de Aquila, *Rzedowski* 17948 (CAS, ENCB, MICH); San Juan de Lima, *Villareal* 8608 (ENCB, MICH).

Annotations on specimens cited above include *R. albiflora*, *R. megasphaera*, and a new species of *Ruellia*. Leonard proposed, but never published, a name for it in reference to the many bracts. The name published by Sessé and Mociño appears to be the first for it. The potential competing homonym, *R. amoena* Nees, a name often applied to a commonly cultivated, red-flowered *Ruellia* from South America (i.e., *R. graecizans* Backer), was published as a synonym and is therefore not valid according to nomenclatural rules (Greuter 1988).

The protologue includes a description, citation of a locality ("Coahuayanae" = Coahuayana, 18°44'N, 103°41'W, in the Mexican state of Michoacán according to *McVaugh* 1977: 159), where the "Third Excursion" spent time "probably in Jan 1791," a date ("Jannuario") of flowering, and reference to a plate (Fl. Mex. Ic. 414). A fragment of a specimen (no. 2148 at F) from the Sessé and Mociño herbarium at MA labelled as "*Ruellia amoena*" does not pertain to this species. It is, rather, *R. inundata* Kunth, a species with smaller, blue to pink corollas. Another specimen in the Sessé and Mociño herbarium (no. 2162, photo and fragment at F) is *R. megasphaera*, a similar species with reddish, tubular corollas (see above). There does not appear to be a specimen of *R. amoena* in the Sessé and Mociño herbarium. Although the corolla color is stated in the description as being "purpurei" (like most Mexican forms of *R. inundata*), other aspects of the description (e.g., "stamina exserta" and "suffrutex tripedalis") indicate a clear correspondence with the plant in the plate. In the plate, the corolla is red. Further indirect evidence that the

plant depicted in the plate is *R. amoena* is provided by recent collections of this species from the vicinity of Coahuayana. In the absence of a specimen, the plate is here selected as the lectotype.

Ruellia amoena can be distinguished from its nearest morphological relatives by the key above. In spite of the differences in corolla form, orientation, and color, this species appears to be particularly closely related to *R. foetida*. In at least two localities where the ranges of these species overlap, plants with characters intermediate between *R. amoena* and *R. foetida* have been found. *Barclay 1954* (US) from Acapulco, Guerrero, contains a plant with some stems predominately glabrous, whereas others show some development of very short trichomes. The corollas of this collection, none of which are preserved on the specimen, are reported as being pink. Several specimens of *Palmer 1286* from Armeria, Colima, at US have cauline trichomes up to 0.1 mm long and pinkish corollas from 36 to 42 mm in length. Another specimen of this number at US and several specimens of *Palmer 1287* from the same locale contain more typical representatives of *R. amoena* (i.e., with cauline trichomes 0.1–1 mm long and corollas 45–49 mm long). The unusual specimens from Acapulco and Armeria are treated under *R. amoena*, but they may represent hybrids between this species and *R. foetida*.

Ruellia novogaliciana T. F. Daniel, sp. nov.

Figs. 2f, g; 8f, g.

TYPE. MEXICO. Michoacán: Distr. Coalcomán, Coalcomán, 3 Feb 1939, *Hinton et al. 12931* (holotype: MO!; isotypes: RSA! US!).

Frutex usque ad 2 m altus. Caules juniores subquadrati vel quadrati-sulcati, pubescentes et glandulosi-punctati. Folia petiolata, laminae ovatae vel ellipticae, 25–133 mm longae, 9–65 mm latae, 2–3.3-plo longiores quam latiores. Flores sessiles vel brevipedicellati in axillis foliorum et in axillis bractearum distalium plerumque congestarum foliiformium, pedicelli usque ad 1 mm longi. Bracteolae absentes. Calyx zygomorphus, 6–11 mm longus, extus glandulosus-punctatus, lobi inaequaliter connati. Corolla rubra, 70–83 mm longa, extus glandulosa-punctata, tubo 32–42 mm longo. Capsula 11.5–13 mm longa, extus puberula et glandulosa-punctata. Semina 5 mm longa, 4.5 mm lata.

Shrub to 2 m tall. Young stems subquadrate to quadrate-sulcate, covered with sessile, patelliform glands, more or less evenly pubescent (or the trichomes concentrated in 2 lines) with an inconspicuous understory of straight, eglandular trichomes less than 0.05 to 0.1 mm long and an overstory of straight to flexuose, eglandular trichomes 0.2–0.8 mm long, soon becoming glabrate, or the internodes glabrous and the nodes with straight, eglandular trichomes up to 1 mm long. Leaves petiolate, the petioles to 35 mm long, the blades ovate to elliptic, 25–133 mm long, 9–65 mm wide, 2–3.3 times longer than wide, acute at base, acute to acuminate at apex, the surfaces covered with sessile, patelliform glands, sparsely pubescent with eglandular trichomes or glabrate, the margin entire, sometimes undulate. Flowers solitary, sessile or short (to 1 mm) pedicellate in axils of leaves and distal, often congested, leaflike bracts. Bracts subsessile, ovate, 19–50 mm long, 6–16 mm wide, truncate to subcordate at base, pubescent like leaves. Bractlets absent. Calyx zygomorphic, 6–11 mm long, the external surface covered with sessile, patelliform glands and pubescent with eglandular trichomes 0.05–0.3 mm long, the internal surface pubescent with antrorsely appressed eglandular trichomes, the tube 1.5–4 mm long, the lobes 4–7.5 mm long, 2 pairs of lobes united for $\frac{1}{2}$ or more of their length, the remaining lobe lance-subulate, 1–1.5 mm wide. Corolla red, 70–83 mm

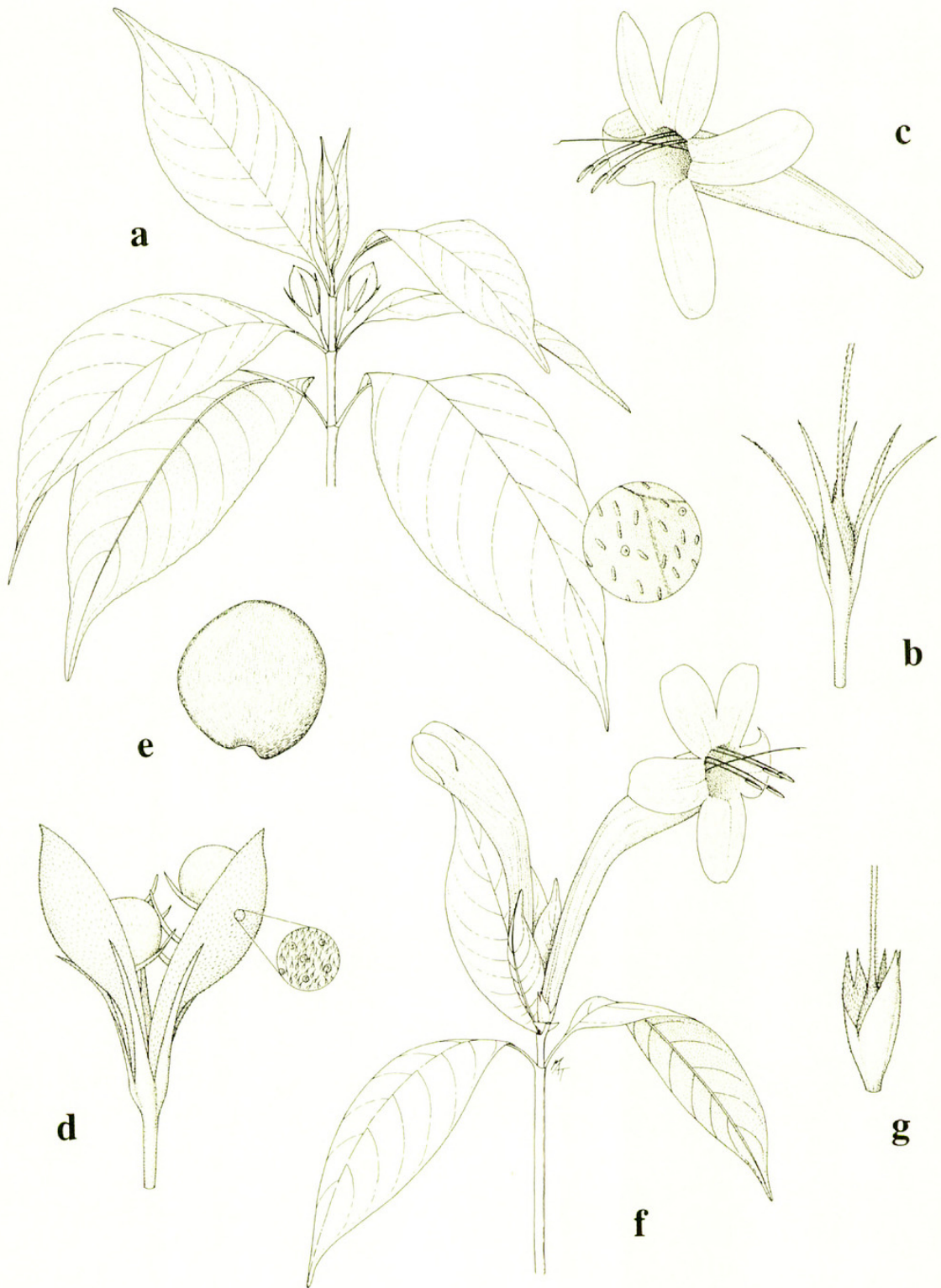


FIG. 8. *Ruellia mcvaughii* and *Ruellia novogaliciana*. a-e, *R. mcvaughii*: a. Fruiting shoot with enlargement of leaf surface showing sessile glands and cystoliths (Cowan & Nieves H. 4746); shoot $\times 0.5$, enlargement $\times 10$. b. Pedicel, calyx, and base of gynoecium (McVaugh 12148), $\times 2.6$. c. Flower with calyx removed (McVaugh 12148), $\times 0.75$. d. Opened capsule with enlargement of surface showing sessile glands and trichomes (McVaugh 12148); capsule $\times 2.5$, enlargement $\times 10$. e. Seed (McVaugh 12148); $\times 5$. f-g, *R. novogaliciana*: f. Flowering shoot with a bract removed to show sessile flower (Hinton et al. 12931), $\times 0.75$. g. Calyx and base of gynoecium (Hinton et al. 12931), $\times 2.7$.

long, externally covered with sessile, patelliform glands (especially evident on buds) and pubescent with eglandular trichomes 0.2–0.4 mm long, the tube 32–42 mm long, gradually ampliate into a funnellform throat 19–27 mm long, 8.5–11 mm in diameter near midpoint, the limb 30–40 mm in diameter with lobes linear-elliptic, 11–20 mm long, 5.5–9 mm wide. Stamens inserted at base of throat, exerted, didynamous, the shorter pair 24–32 mm long, the longer pair 27–36 mm long, the thecae 4–4.7 mm long. Style 65–80 mm long, pubescent with eglandular trichomes; stigmatic lobes unequal with one 1.5–2 mm long and the other 0.2 mm long. Capsule ellipsoid, 11.5–13 mm long, covered with sessile, patelliform glands and puberulent with eglandular trichomes 0.1–0.2 mm long, the stipe 2 mm long, the head 9.5–11 mm long. Seeds up to 8 per capsule, subcordate, 5 mm long, 4 mm wide, the surfaces covered with appressed, hygroscopic trichomes.

Distribution and habitats. Known only from the pine-oak forests near Coalcomán in western Michoacán (southwestern Mexico) at elevations from 1000–1350 m (Fig. 3).

Phenology. Flowering February to April; fruiting in April.

PARATYPES. MEXICO. Michoacán: Distr. Coalcomán, Coalcomán, *Hinton et al.* 12954 (GH, RSA, US); Distr. Coalcomán, Pto. Zarzamora, *Hinton et al.* 13720 (RSA, US).

Leonard annotated all of Hinton's collections of this species as *R. thyrsacanthoides* (Nees) Lindau, a species described from Colombia. Although Leonard had previously annotated specimens from Colombia with this name, he cited these specimens under *R. humboldtiana* in his 1951 treatment of the Acanthaceae of Colombia. In that account the name *R. thyrsacanthoides* is not mentioned. Presumably he equated the two taxa; indeed, Nees (1847) had suggested that *R. thyrsacanthoides* likely was conspecific with a variety of *R. humboldtiana*. As Nees (1847) noted, and as my examination of an isotype (*Moritz* 1274, P) of *R. thyrsacanthoides* confirms, the two species differ primarily by the conspicuous pubescence of flexuose to retrorsely appressed, eglandular trichomes up to 1 mm long on the stems and leaves of *R. thyrsacanthoides* versus the lack of hairs on these structures in *R. humboldtiana*. At least one specimen (*Haught* 2458) cited by Leonard (1951) has stems and leaves with inconspicuous, retrorse, and eglandular trichomes up to 0.3 mm long.

Specimens from northern South America conforming to *R. humboldtiana* resemble *R. novogaliciana* by their long, tubular, and red corollas and sessile, patelliform glands. The former species differs from the latter by its lack of bracts during anthesis (vs. prominent, persistent bracts present), multi-flowered dichasia (vs. solitary flowers), actinomorphic (vs. zygomorphic) calyx, shorter (50–60 mm vs. 75–83 mm) corollas, and longer (13–17 mm vs. 11.5 mm) capsules.

The distinctions between *R. novogaliciana* and similar species in Mexico are summarized in the key above.

Ruellia mcvaughii T. F. Daniel, sp. nov.

Figs. 2e, 8a–e.

TYPE. MEXICO. Nayarit: ca. 4 mi E of Jalcocotán, on rd to Tepic, 22 Apr 1951, *McVaugh* 12148 (holotype: MICH!; isotype: US!).

Frutex usque ad 4 m altus. Caules juniores subquadrati vel quadrati-sulcati, pubescentes et glandulosi-punctati. Folia petiolata, laminae ovatae vel ellipticae, 25–145 mm longae, 11–54 mm latae, 2.2–3.4-plo longiores quam latiores. Flores

pedicellati in axillis foliorum distalium, pedicelli 3–8 mm longi. Bracteolae absentes vel praesentes. Calyx profunde quinquelobus, 6.5–14 mm longus, extus glandulosus-punctatus, lobi subaequales. Corolla rubra, 60–74 mm longa, extus glandulosa-punctata, tubo 28–44 mm longo. Capsula 12–14.5 mm longa, extus puberula et glandulosa-punctata. Semina 3.5–4.5 mm longa, 3–4.5 mm lata.

Shrub to 4 m tall. Younger stems subquadrate to quadrate-sulcate, covered with sessile, patelliform glands when young and inconspicuously puberulent with scattered, eglandular trichomes up to 0.05 mm long or conspicuously pubescent with mostly antrorse, eglandular trichomes 0.05–1 mm long. Leaves petiolate, the petioles to 30 mm long, the blades ovate to elliptic, 25–145 mm long, 11–54 mm wide, 2.2–3.4 times longer than wide, acute to subattenuate at base, acute to acuminate to subfalcate at apex, the surfaces covered with sessile, patelliform glands and pubescent like young stems, soon glabrate, the margin entire, sometimes undulate. Flowers solitary, pedicellate in axils of distal leaves, the pedicels 3–8 mm long, pubescent like young stems. Bractlets absent or, if present, subulate, 1–2.5 mm long, 0.4 mm wide. Calyx 6.5–14 mm long, the tube 1.5–2.5 mm long, the lobes subulate, subequal, 6.5–11.5 mm long, 0.8–1.3 mm wide, the abaxial surface covered with sessile, patelliform glands and puberulent (especially along margins) with eglandular trichomes up to 0.1 mm long, the adaxial surface pubescent with antrorse to antrorsely appressed eglandular trichomes. Corolla red, 60–74 mm long, externally covered with sessile, patelliform glands (these sometimes inconspicuous on mature corollas) and pubescent with eglandular trichomes 0.1–0.2 mm long, the tube 28–44 mm long, gradually ampliate into a poorly distinguished, funnellform throat 10–12 mm long, 7.5–12 mm in diameter near midpoint, the limb 37–53 mm in diameter with lobes linear-elliptic, 17–25 mm long, 8–10 mm wide. Stamens inserted at base of throat, exerted, didynamous, the shorter pair 15–23 mm long, the longer pair 17–24 mm long, the thecae 4–5 mm long. Style 60–63 mm long, pubescent with eglandular trichomes; stigmatic lobes unequal with one 1.5–2 mm long and the other not evident. Capsule ellipsoid, 12–14.5 mm long, covered with sessile, patelliform glands and puberulent with eglandular trichomes 0.1–0.2 mm long, the stipe 2–3.5 mm long, the head 10–11 mm long. Seeds 6 (–8) per capsule, subcirculate, 3.5–4.5 mm long, 3–4.5 mm wide, the surfaces covered with appressed, hygroscopic trichomes.

Distribution and habitats. West-central Mexico (southern Nayarit and northwestern Jalisco) from 500–1000 m (Fig. 3) on slopes in oak and pine-oak forests.

Phenology. Flowering February to May; fruiting April to May.

PARATYPES. MEXICO. Jalisco: Talpa de Allende, KM 12.8 en el camino de La Cuesta hacia Talpa, Cowan & Nieves H. 4746 (CAS); Mpio. Cabo Corrientes, 3–10 km E on rd to Mina del Cuale from junction 5 km NW of El Tuito, McVaugh 26409 (MICH).

In 1953 Leonard annotated the type as *R. thyrsacanthoides*. *Ruellia mcvaughii* differs most noticeably from *R. humboldtiana* (including *R. thyrsacanthoides*, see above) by its solitary flowers in the axils of distal leaves (vs. flowers borne in multi-flowered, axillary dichasia along distal portions of stems, forming a naked, terminal panicle) and mostly shorter (12–14.5 mm vs. 13–17 mm) capsules. Another feature of the South American species noted by both Nees (1847) and Leonard (1951), and also evident on specimens I examined, is a prominent thickening toward the distal end of many of the nodes of the inflorescence rachis. Leonard (1951) described these nodes as conelike. Although there are no similar rachis nodes in either *R.*

mcvaughii or *R. novogaliciana*, the pedicels of the former species are usually thickened distally.

Distinctions between *R. mcvaughii* and similar species in Mexico are summarized in the key above. McVaugh noted on the herbarium label that at the type locality plants of this species were the commonest shrub in shaded places. *McVaugh 26409* differs from other specimens by its cauline trichomes (conspicuous, antrorse, 0.05–1 mm long vs. inconspicuous, straight, up to 0.05 mm long) and bractlets (present vs. absent).

The species is named in honor of the collector of its type, Rogers McVaugh, authority on the flora of western Mexico and exemplary teacher of systematic botany.

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LITERATURE CITED

- Bentham, G. 1876. Acanthaceae. In *Genera plantarum*, vol. 2, by G. Bentham and J. D. Hooker, 1060–1122. London: Reeve and Co.
- Cavanilles, A. J. 1799. *Icones et descriptiones plantarum*, vol. 5. Madrid.
- Daniel, T. F. 1988. A systematic study of *Bravaisia* DC. (Acanthaceae). *Proc. Calif. Acad. Sci.* 45: 111–132.
- Fernald, M. L. 1897. Some rare and undescribed plants collected by Dr. Edward Palmer, at Acapulco, Mexico. *Proc. Amer. Acad. Arts* 33: 86–94.
- Gibson, D. N. 1974. Acanthaceae. In *Flora of Guatemala*, ed. P. C. Standley et al., Fieldiana, Bot. 24(pt. 10): 328–461.
- Greuter, W. 1988. *International code of botanical nomenclature*. Königstein: Koeltz Scientific Books.
- Hemsley, W. B. 1882. Acanthaceae. In *Biologia centrali-americana: Botany*, by W. B. Hemsley, 2: 500–526. London: R. H. Porter and Dulac and Co.
- Jackson, B. D. 1895. *Index Kewensis*, vol. 2. Oxford: Clarendon Press.
- Johnsgard, P. A. 1983. *The hummingbirds of North America*. Washington: Smithsonian Institution Press.
- Leonard, E. C. 1951. The Acanthaceae of Colombia, I. *Contr. U.S. Natl. Herb.* 31: 1–117.
- Lindau, G. 1895. Acanthaceae. In *Die natürlichen Pflanzenfamilien*, eds. A. Engler and K. Prantl, IV(3b): 274–354. Leipzig: Wilhelm Engelmann.
- . 1898. Einige neue Acanthaceen aus dem Herbarium Delessert. *Ann. Cons. Jard. Bot. Genève* 2: 38–40.
- . 1913. Einige neue Acanthaceen aus Zentralamerika. *Repert. Spec. Nov. Regni Veg.* 12: 423–426.
- McVaugh, R. 1977. Botanical results of the Sessé & Mociño Expedition (1787–1803). I. Summary of excursions and travels. *Contr. Univ. Michigan Herb.* 11: 97–195.
- . 1980a. Karwinski's itineraries in Mexico, 1827–1832 and 1841–1843. *Contr. Univ. Michigan Herb.* 14: 141–152.
- . 1980b. Botanical results of the Sessé & Monciño Expedition (1787–1803) II. The *Icones Florae Mexicanae*. *Contr. Univ. Michigan Herb.* 14: 99–140.
- Nees von Esenbeck, C. G. 1836. *Gymnacanthus*. In *A natural system of botany*, ed. 2, by J. Lindley, p. 444. London: Longman et al.
- . 1846. Acanthaceae. In *The botany of the voyage of H.M.S. Sulphur*, by G. Bentham, pt. 6, 145–149. London: Smith, Elder and Co.

- . 1847. Acanthaceae. In *Prodromus systematis naturalis regni vegetabilis*, ed. A. de Candolle, 11: 46–519. Paris: Victoris Masson.
- Oersted, A. S. 1854. Mexico og Centralamerikas Acanthaceer. Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1854: 113–181.
- Urban, I. 1897. Biographische Skizzen. V. Bot. Jahrb. Syst. 24, Beiblatt 58: 1–15.



Daniel, Thomas Franklin. 1990. "New, reconsidered, and little-known Mexican species of *Ruellia* (Acanthaceae)." *Contributions from the University of Michigan Herbarium* 17, 139–162.

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