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NEW AND RECONSIDERED MEXICAN ACANTHACEAE. V.

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As study of the approximately 360 species of Mexican Acanthaceae progresses, numerous undescribed species have become evident. Five of these, *Chileranthemum lottiae*, *Justicia torresii*, *J. valvata*, *Pseuderanthemum floribundum*, and *Ruellia guerrerensis*, are described below. Also, several poorly known and reconsidered species are discussed.

NEW SPECIES

Chileranthemum lottiae T. F. Daniel, sp. nov.—TYPE: MEXICO. Guerrero: Acapulco, 23 Dec 1958, *Paray 2857* (holotype: ENCB!; isotypes: MEXU! MICH!). Fig. 1.

Frutex usque ad 2 m altus. Folia subsessilia vel petiolata, laminae ovato-ellipticae vel ellipticae vel lanceolato-ellipticae, 2.7–19.5 cm longae, 1.1–7.2 cm latae, 2–4.8plo longiores quam latiores. Thyrsi densiflori usque ad 15.0 cm longi et 1.4–2.2 cm diametro in medio. Bracteae caducae, lanceolato-subulatae, 4–8 (–12) mm longae, 0.5–1 mm latae. Bracteolae 2–7 mm longae, 0.4–0.7 mm latae. Calyx 5.5–13 mm longus lobis linearibus vel lanceolato-subulatis, 5–11 mm longis, basi 0.5–0.8 mm latis. Corolla purpurea, 13–21 mm longa. Stamina inclusa, 3 mm longa et stylus exsertus, 10–12 mm longus vel stamina exserta, 6–10 mm longa et stylus inclusus, 3.5–5.8 mm longus. Capsula 19–27 mm longa, puberula.

Shrub to 2 m tall; young stems terete to quadrate, evenly pubescent with antrorse to flexuose to retrorse, eglandular trichomes 0.1–0.5 mm long, the trichomes often becoming concentrated in 2 lines on mature stems, older stems blistered (especially along corners of quadrate internodes), becoming glabrate as epidermis exfoliates. Leaves subsessile to petiolate; naked portion of petioles to 10 mm long; blades ovate-elliptic to elliptic to lance-elliptic, 2.7–19.5 cm long, 1.1–7.2 cm wide, 2–4.8 times longer than wide, acute to acuminate (to subfalcate) at apex, attenuate (often decurrent along petiole nearly to or to node) at base, surfaces sparsely pubescent when young, later glabrous or nearly so, margin entire to subsinuate. Inflorescence a narrow (1.4–2.2 cm in diameter near midpoint, exclusive of corollas and capsules), densely flowered thyrse to 15.0 cm long, thyrse axis pubescent with flexuose, usually somewhat appressed, eglandular trichomes to 0.5 mm long; dichasia sessile or borne on peduncles to 3 mm long, many-flowered, often congested so as to obscure thyrse axis; flowers borne on pedicels 1–5 mm long. Bracts caducous, lance-subulate, 4–8 (–12) mm long, 0.5–1 mm wide, pubescent with flexuose to antrorse-appressed trichomes 0.1–0.3 mm long. Bractlets and secondary bractlets subulate, 2–7 mm long, 0.4–0.7 mm wide, pubescent like bracts. Calyx 5.5–13 mm long during anthesis, often somewhat accrescent in fruit, tube 0.5–1 mm long, lobes linear to lance-subulate, 5–11 mm long, 7–13

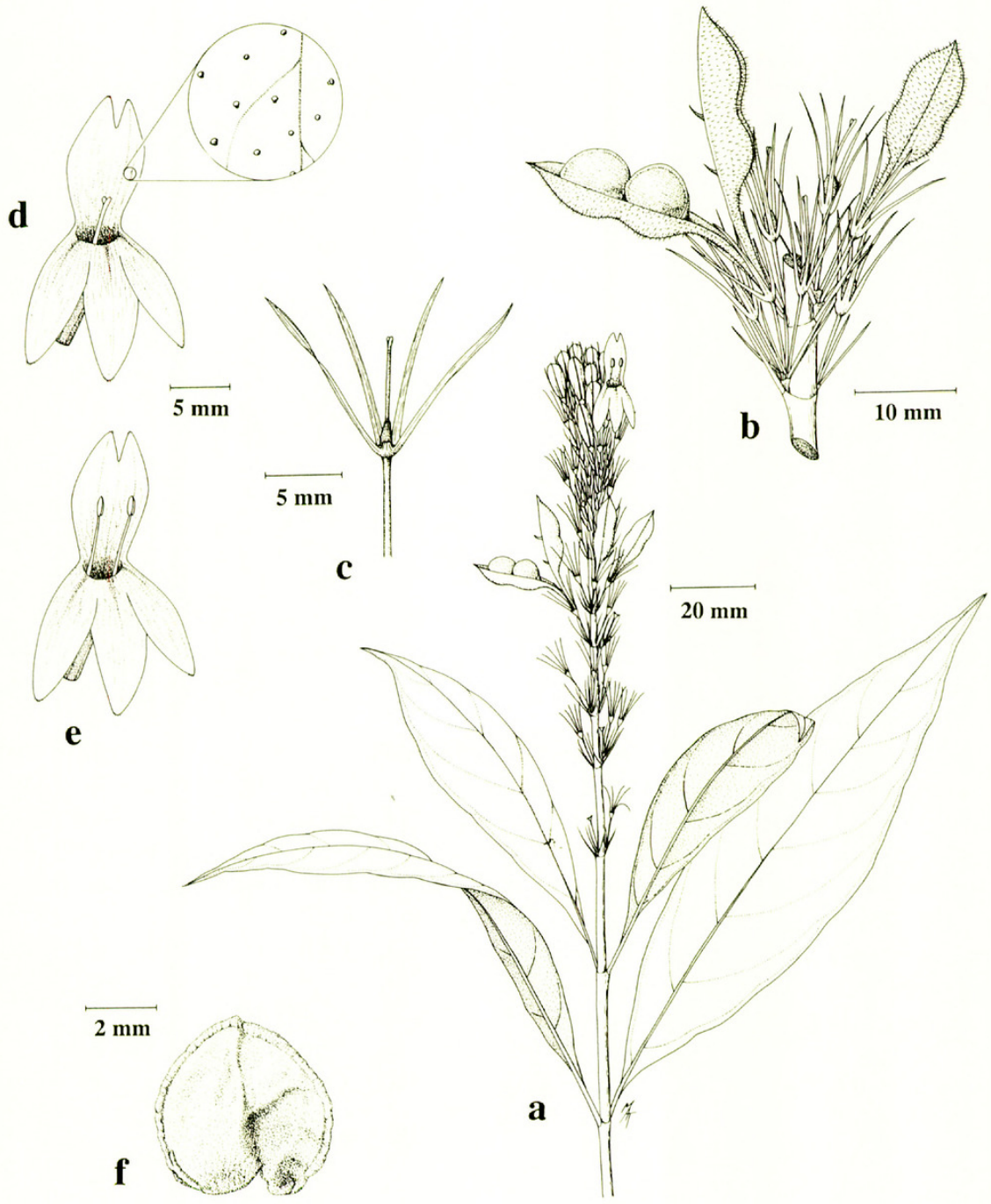

FIG. 1. *Chileranthemum lottiae*. a. Habit (*Paray 2858*). b. Portion of inflorescence with capsules (*Paray 2857*). c. Calyx (with one lobe removed) and gynoecium (*Paray 2858*). d. Long-styled (pin) flower with enlargement showing pubescence (*Paray 2857*). e. Short-styled (thrum) flower (*Paray 2858*). f. Seed (*Paray 2857*). Drawn by Mary Ann Tenorio.

times longer than tube, 0.5–0.8 mm wide at base, abaxial surface sparsely pubescent with mostly antrorse, eglandular trichomes 0.05–0.2 mm long, and often with short-stipitate glands up to 0.05 mm long (glandular-puberulent), adaxial surface glandular-puberulent, the calyx rarely with 2 lobes united for most of their length. Corolla blue-purple with a white stripe on lower lip, 13–21 mm long, externally glabrous, inner surface glandular-puberulent, common portion of lower lip and distal portion of tube bearded with eglandular trichomes to 0.2 mm long, margins

of lobes ciliolate with eglandular trichomes to 0.1 mm long, tube 6.5–11 mm long, upper lip 6.5–9.5 mm long with lobes 1.5–2.5 mm long, lower lip 7.5–11 mm long with elliptic to obovate-elliptic lobes 6–10 mm long, 2.5–4.5 mm wide. Stamens of "pin flowers" included, 3 mm long, thecae 1.6 mm long, stamens of "thrum flowers" exserted, 6–10 mm long, thecae 1.5–2.3 mm long; pollen (Fig. 2a–c) prolate, 3-colporate, 6-pseudocolpate, the 2 pseudocolpi in each mesocolpium often fused into a pseudocolpal ellipse, surface reticulate; staminodes 0.2–0.5 mm long. Style curved to recurved just proximal to stigma, glabrous or sparsely pubescent with eglandular trichomes (sometimes restricted to distal portion), style of "pin flowers" exserted, 10–12 mm long, style of "thrum flowers" included, 3.5–5.8 mm long; stigma subfunnelform to bilobed with lobes 0.1–0.2 mm long. Capsule 19–27 mm long, pubescent with straight or bent, eglandular trichomes 0.05–0.4 mm long, stipe 8–13 mm long, head 11–16 mm long. Seeds subcircular in outline, 5–5.5 mm in diameter, surfaces smooth, glabrous.

Phenology. Flowering: August and December; fruiting: December.

Distribution (Fig. 3). West-central Mexico (Guerrero and Jalisco); rocky hills near the coast in regions of tropical deciduous forest; 50–100 m.

PARATYPES. **Mexico.** Guerrero: Acapulco, 23 Dec 1958, *Paray 2858* (ENCB).—JALISCO: Mpio. La Huerta, Rancho Cuixmala, Cumbres 1, Arroyo Cajones, ca. 3 km inland from Puerto Vallarta-Barra de Navidad hwy, 19 Aug 1991, *Lott et al. 3794* (CAS, MEXU, MICH, NY, UCR, US); near Playa Cuastecomate, 8 km NW of Navidad, 11–12 Dec 1959, *McVaugh & Koelz 1686* (MICH).

Like the two previously described species of *Chileranthemum* Oerst., *C. lottiae* is heterostylous. For example, the holotype and isotypes possess long-styled or "pin" flowers, whereas the paratype from the same locality has short-styled or "thrum" flowers. Heterostyly has also been reported in three other genera of tribe Justicieae subtribe Odontoneminae, *Odontonema* Nees, *Oplonia* Raf., and *Pseuderanthemum* Radlk. These genera and *Chileranthemum* appear to form a distinct lineage within the subtribe (Daniel & Chuang, unpubl.).

The three species of *Chileranthemum* are geographically separated from one another. Morphologically, characters of the calyx have been used to distinguish *C. violaceum* Miranda from *C. trifidum* Oerst. *Chileranthemum lottiae* more closely resembles the latter species in features of the calyx and can be distinguished from both *C. violaceum* and *C. trifidum* by its pubescent capsules. The following key distinguishes the species of this Mexican genus.

1. Calyx tube (2–) 3–6 mm long, calyx lobes ovate to broadly triangular, 3–7 mm long, 2–3.5 mm wide at base; southern Mexico (Oaxaca and Chiapas). *C. violaceum.*
1. Calyx tube 0.5–1.5 mm long, calyx lobes linear to lance-subulate to subulate, 4–11 mm long, 0.5–1 mm wide at base.
   2. Inflorescence of axillary or terminal, few-flowered, open cymes to 3 cm long; capsule 12–18 mm long, glabrous; northeastern Mexico (Hidalgo, Puebla, Veracruz). *C. trifidum.*
   2. Inflorescence of terminal, many-flowered, narrow thyrses to 15 cm long; capsule 19–27 mm long, pubescent; west-central Mexico (Guerrero and Jalisco). *C. lottiae.*

Chileranthemum lottiae is named in honor of Emily Lott who collected a paratype of it and whose many excellent collections of Acanthaceae from coastal Jalisco have greatly enhanced our knowledge of the family.

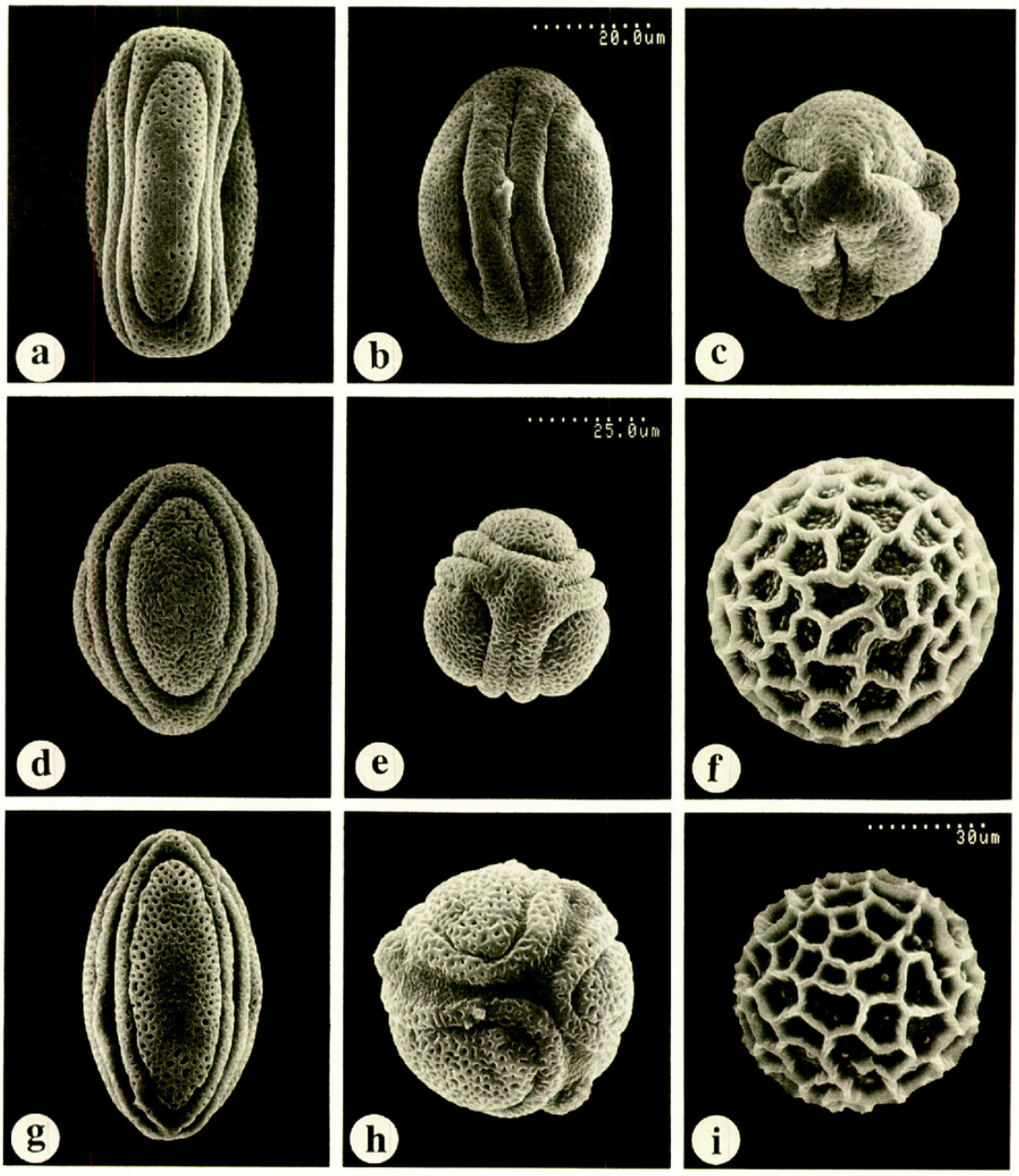

FIG. 2. Scanning electron micrographs of pollen. a. *Chileranthemum lottiae* (*Paray 2858*), intercolpal view. b. *C. lottiae* (*Paray 2858*), colpal view. c. *C. lottiae* (*Paray 2858*), polar view. d. *Pseuderanthemum floribundum* (*Daniel 5381*), intercolpal view. e. *Pseuderanthemum floribundum* (*Daniel 5381*), polar view. f. *Ruellia guerrerensis* (*Hinton et al. 11296*). g. *Pseuderanthemum pihuamoense* (*Daniel et al. 6283*), intercolpal view. h. *P. pihuamoense* (*Daniel et al. 6283*), polar view. i. *Ruellia rosea* (*Daniel & Baker 3736*).

Pseuderanthemum floribundum T. F. Daniel, sp. nov.—TYPE: MEXICO. Oaxaca: along Mex. 131 between Puerto Escondido and Sola de Vega, 26.9 km N of San Gabriel Mixtepec, 1275 m, 14 Nov 1987, *Daniel 5381* (holotype: CAS!; isotypes: C! DUKE! ENCB! F! GH! K! MEXU! MICH! MO! NY! US!). Fig. 4.

Herba perennis usque ad 1.5 m alta caulibus crassis. Laminae foliorum late ellipticae vel late ovato-ellipticae, 10–28 cm longae, 5.5–21.5 cm latae, 1.3–1.8plo longiores quam latiores. Inflorescentia paniculata composita multiflora usque ad 35 cm longa ramis glandulosis. Bracteae inflorescentiae subfoliaceae sessiles

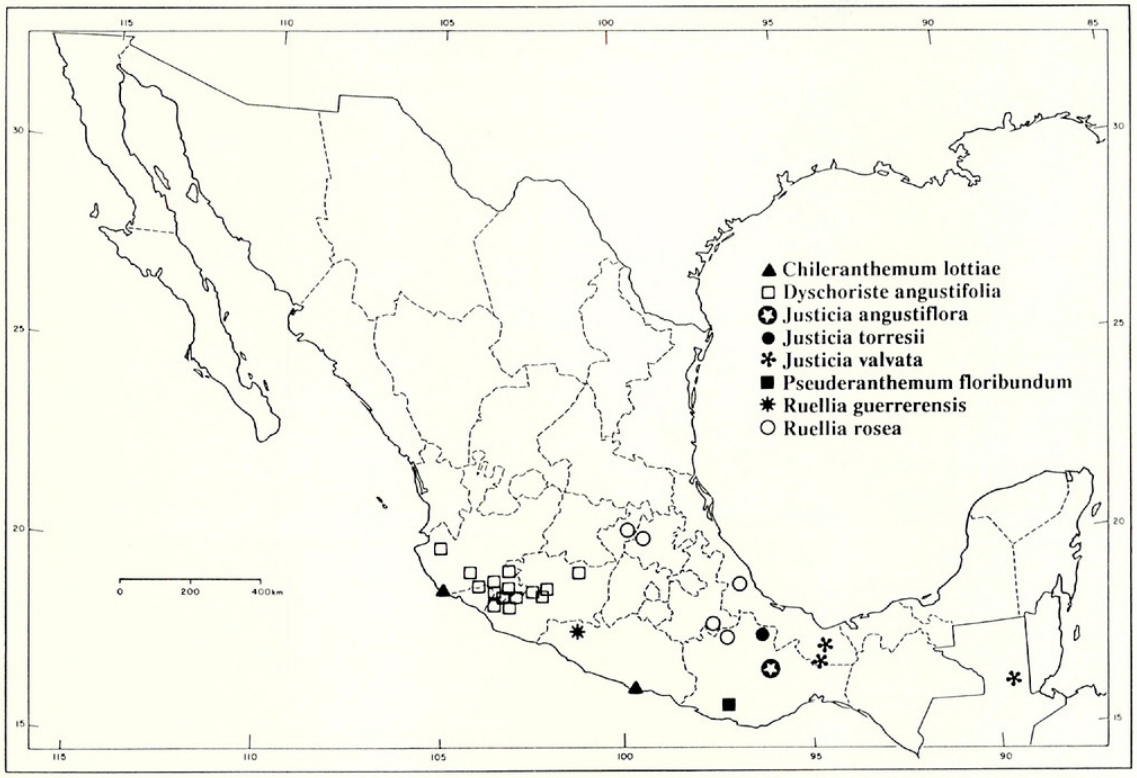

FIG. 3. Distribution of *Chileranthemum lottiae*, *Dyschoriste angustifolia*, *Justicia angustiflora*, *J. torresii*, *J. valvata*, *Pseuderanthemum floribundum*, *Ruellia guerrerensis*, and *R. rosea*.

amplectentes. Bracteae florales anguste ellipticae vel ovatae, 2–6 mm longae, 0.8–1.8 mm latae. Calyx 4–7 mm longus, extus glandulosus. Corolla roseo-purpurea, bilabiata, 29–35 mm longa. Capsula 21–25 mm longa, glandulosa. Semina 4, subcordata, 4–5 mm longa, 3.7–4 mm lata.

Perennial herb to 1.5 m tall, sometimes rooting at nodes; young stems quadrate-sulcate, up to 13 mm across one side, pubescent with flexuose to flexuose-antrorse, eglandular trichomes 0.3–1 mm long, the trichomes disposed throughout internode although concentrated in 2 lines, pith of mature stems large and styrofoamlike. Leaves present during anthesis, sessile (distally) to petiolate (proximally); petioles purplish when fresh, up to 15.5 cm long, shorter than blade, winged from blade, wing up to 2.8 cm wide near blade and tapering nearly to or to node; blades somewhat corrugated when fresh, broadly elliptic to broadly ovate-elliptic, 10.0–28.0 cm long, 5.5–21.5 cm wide, 1.3–1.8 times longer than wide, acute at apex, rounded to attenuate at base, adaxial surface sparsely pubescent with cauline type trichomes, abaxial surface pubescent with cauline type trichomes on major veins and with submarginal white sublinear to substellate thickened regions 0.5–1.5 mm long at some vein junctions, margin entire, flat to subrevolute. Inflorescence of axillary (from axils of subfoliose inflorescence bracts) and terminal, pedunculate spicate axes or panicles of spicate axes up to 20 cm long, forming a terminal, subfoliose panicle up to 35 cm long, main inflorescence axis pubescent with an understory of glandular trichomes 0.05–0.2 mm long (glandular-puberulent) and an overstory of flexuose, eglandular trichomes 0.2–0.6 mm long, peduncles up to 80 mm long, pubescent like main inflorescence axis, individual spicate axes glandular-puberulent, subtended by progressively reduced inflorescence bracts; inflorescence bracts sessile-clasping, oblate to circular to broadly ovate-elliptic, 1–19 cm long, 0.8–14 cm wide, 0.8–1.5 times longer than wide, cordate to rounded at

base, emarginate to rounded to acute at apex, proximal inflorescence bracts pubescent like leaves, distal inflorescence bracts usually pubescent like inflorescence axes; flowers arranged in dichasia in axil of a bract, the dichasia sessile, rarely reduced to a single flower, the flowers borne on pedicels to 5 mm long, pedicels glandular-puberulent. Bracts narrowly elliptic to ovate, 2–6 mm long, 0.8–1.8 mm wide, abaxial surface pubescent like rachis or nearly glabrous, margin ciliate with eglandular trichomes up to 0.5 mm long. Bractlets narrowly elliptic to ovate, 2.2–4 mm long, 0.8–1.2 mm wide, pubescent like bracts. Calyx 4–7 mm long, tube 0.5–2 mm long, lobes lance-subulate, 3–5.5 mm long, subequal (up to 1.3 mm different in length), often accrescent in fruit, 2.5–7 times longer than tube, abaxial surface and margin glandular-puberulent. Corolla pink-purple (drying dark purple) with a solid white area on proximal portion of lower-central lobe, 29–35 mm long, external surface of tube glabrous, that of throat and limb very sparsely pubescent with scattered, mostly eglandular trichomes 0.1–0.3 mm long, margins of lobes sparsely ciliate with similar trichomes, tube cylindric, 18–21 mm long, 1.4–2 mm in diameter (same at base and apex), throat 1.5–3 mm long, 2–3.5 mm in diameter, limb 18–24 mm in diameter, upper lip 8–11 mm long with lobes reflexed, elliptic to obovate-elliptic, 8–11 mm long, 4.7–8.5 mm wide, lower lip 9–14 mm long with lateral lobes elliptic to obovate-elliptic, 6–9.7 mm long, 5–7.5 mm wide, lower-central lobe broadly elliptic to subcircular, 7.5–11 mm long, 5–7.8 mm wide. Stamens 3.5 mm long, exserted 1–1.7 mm beyond mouth, inserted 1.5–2 mm below mouth, filaments 0.8–1 mm long, sparsely pubescent with eglandular and inconspicuous glandular trichomes, thecae parallel, equally inserted, subequal in length, 2.4–2.8 mm long, sparsely pubescent with eglandular trichomes; pollen (Fig. 2d, e) prolate, 3-colporate, 6-pseudocolpate, the 2 pseudocolpi in each mesocolpium fused into a pseudocolpal ellipse, surface reticulate; staminodes 0.5 mm long. Style pink-purple, 21–23 mm long, exserted 0.5–3 mm beyond anthers, pubescent with straight to flexuose, ascendant, eglandular trichomes 0.05–0.2 mm long, distal portion glabrous; stigma lobes 0.1 mm long. Capsule 21–25 mm long, sparsely glandular-puberulent, stipe 8–11 mm long, head 13–15 mm long, retinacula 2.2–3 mm long, the pair 3–4 mm distant in a valve. Seeds 4, subcordate, plano-convex, 4–5 mm long, 3.7–4 mm wide, 1.1–1.3 mm thick, both surfaces verrucose and with irregular anastomozing ridges.

Phenology. Flowering and fruiting: November.

Distribution (Fig. 3). Known only from the Pacific slopes of the Sierra Madre Sur in southern Oaxaca; moist broadleaf evergreen forest with pines; ca. 1275 m.

PARATYPES. **Mexico.** OAXACA: seeds of type (*Daniel 5381*) grown at San Francisco Conservatory of Flowers in 1988–1991, (CAS, K, MEXU, RSA, TEX). State and locality undetermined: seed no. 552 of E. Alexander and J. McDougal grown at Royal Botanic Gardens at Kew in 1947 (K).

Seeds of *Pseuderanthemum floribundum* were collected by E. J. Alexander and J. G. McDougal in Mexico prior to November 1947 and subsequently grown at the Royal Botanical Gardens at Kew. Specimens of the resulting cultivated plants, which flowered in November, 1947, are extant at K. I have not seen any field-collected specimens of this species made by Alexander and McDougal.

This is the largest and showiest species of *Pseuderanthemum* in Mexico. It can be distinguished from all other North and Central American species by its 1) thick and somewhat fleshy stems; 2) large and somewhat corrugated leaf blades; 3) large, open, and pyramidal panicles; and 4) distinctive floral form. Corollas of *P. floribundum* are subhorizontally oriented and have a distinctly bilabiate limb.

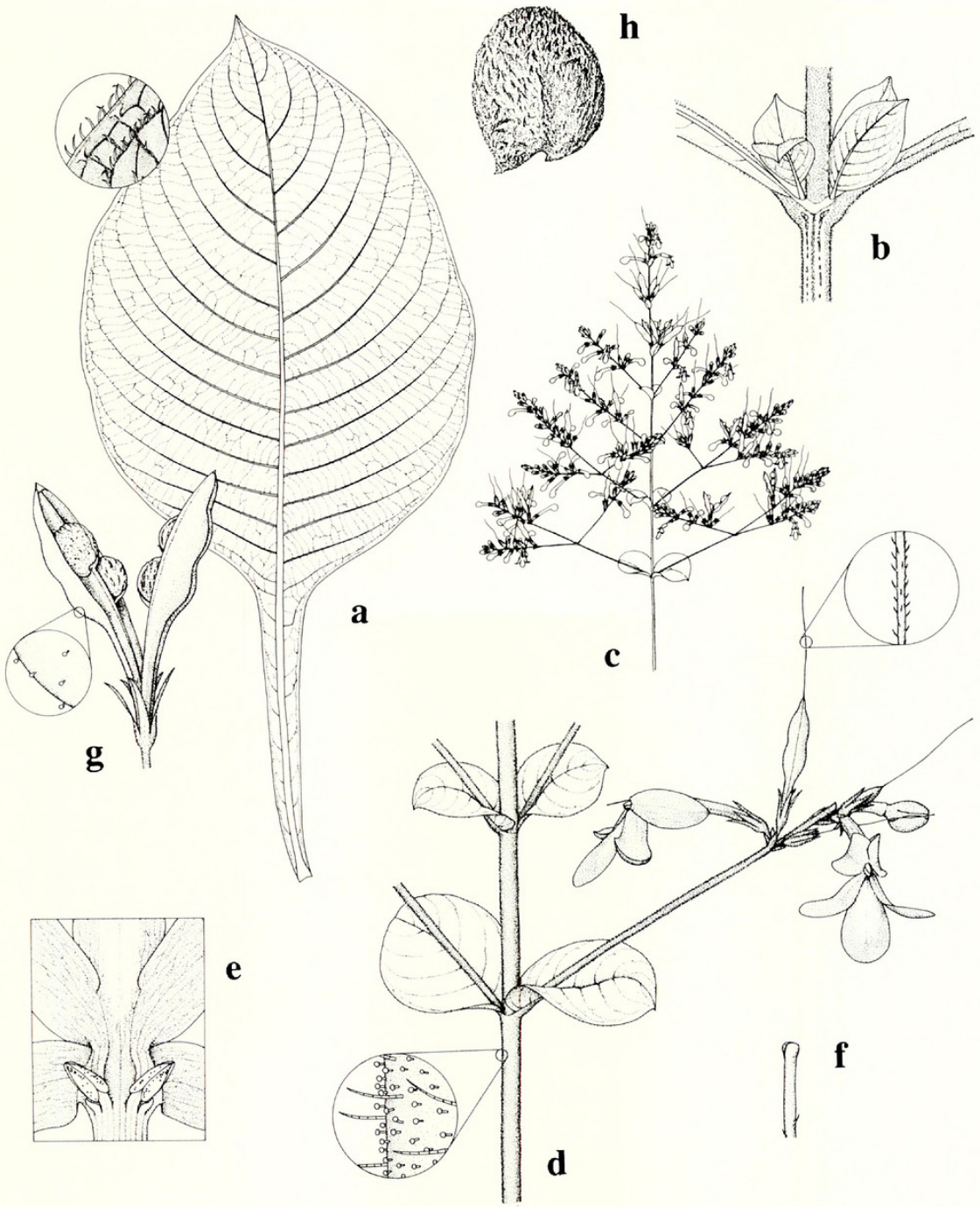

FIG. 4. *Pseuderanthemum floribundum* (*Daniel 5381*). a. Leaf from near base of plant with enlargement showing pubescence and submarginal thickened regions, ×0.33. b. Vegetative node, ×0.5. c. Inflorescence, ×0.16. d. Portion of inflorescence with flowers and fruit and with enlargements showing pubescence of rachis and style, ×1. e. Cut-open view of corolla showing androecium, ×3. f. Distal portion of style and stigma, ×13. g. Opened capsule with enlargement showing pubescence, ×1.8. h. Seed, ×4.5. Drawn by Mary Ann Tenorio.

Other North and Central American species of the genus generally have subvertically oriented flowers with a subrotate limb. In these floral characters, *P. floribundum* resembles most species of *Odontonema*. This resemblance possibly represents floral convergence for a similar pollinator (e.g., hummingbirds, although floral visitors to *P. floribundum* are not known). Flowers of *Pseuderanthemum* (including *P. floribundum*) differ from those of *Odontonema* by their bicolored corollas with reflexed upper lips. In general form, the flowers also resemble those

of *Chileranthemum*. Flowers of the latter genus have considerably shorter corolla tubes, however. The systematic relationships among these three genera deserve considerable further attention.

Ruellia guerrerensis T. F. Daniel, sp. nov.—TYPE: MEXICO. Guerrero: Distr. Mina, Manchon [El Manchón], 3 Dec 1937, *Hinton et al. 11296* (holotype: K!; isotypes: LL! MICH! RSA! UC! US!). Fig. 5.

Frutex usque ad 1 m altus. Caules juniores quadrati vel quadrato-sulcati, internodis plus minusve uniformiter pubescentibus trichomatibus flexuosis vel retrorsis eglandulosis 0.1–0.8 mm longis. Folia petiolata, laminae ovatae vel ovato-ellipticae, 4.0–13.5 cm longae, 1.5–6.8 cm latae, 2–2.7plo longiores quam latiores. Inflorescentia thyrsiformis thyrso terminali multifloro glanduloso. Bracteae petiolatae glandulosae, inferiores foliaceae, superiores anguste ellipticae vel lineares. Bracteolae lineares, 33–60 mm longae, 0.6–1.2 mm latae. Calyx 20–37 mm longus, glandulosus. Corolla lutea, 60–77 mm longa, extus glandulosa, fauce 12–15 mm longa, 8–9.5 mm diametro in medio, limbo 24–29 mm diametro. Stamina 19–28 mm longa thecis 5.5–6.6 mm longis. Capsula glabra.

Shrub to 1 m tall; younger stems quadrate to quadrate-sulcate, internodes more or less evenly, often sparsely, pubescent with flexuose to retrorse, eglandular trichomes 0.1–0.8 mm long, nodes often with clusters of somewhat longer eglandular trichomes. Leaves petiolate; petioles to 2.5 cm long (naked portion to 1.3 cm long); blades ovate to ovate-elliptic, 4.0–13.5 cm long, 1.5–6.8 cm wide, 2–2.7 times longer than wide, acuminate at apex, attenuate to long-attenuate (often tapering to node) at base, surfaces pubescent with flexuose, eglandular trichomes to 1.2 mm long, margin entire to somewhat sinuate-denticulate. Inflorescence a terminal, leafy (near base) thyrse, rachis pubescent with straight to subflexuose, glandular and eglandular trichomes to 1 mm long; dichasia pedunculate, many-flowered, peduncles (arising from axils of distal several pairs of leaves at base of thyrse and from bracts near apex of thyrse) to 6.5 cm long, pubescent like rachis; flowers borne on pedicels 2–12 mm long, pedicels pubescent like rachis. Bracts foliose at base of thyrse, gradually reduced acropetally, bracts near midthyrse 40-50 mm long, petioles to 25 mm long, blades ovate-elliptic to elliptic, 20–27 mm long, 3.5–7.5 mm wide, distal bracts reduced to 26 mm long and 2.5 mm wide with narrowly elliptic to linear blades, bracts near midthyrse and distal bracts pubescent like rachis. Bractlets and secondary bractlets linear, 33–60 mm long, 0.6–1.2 mm wide, pubescent like rachis. Calyx 20–37 mm long, tube 3–4.5 mm long, lobes subequal, linear-subulate, 17–31 mm long, 4.7–8.3 times longer than tube, 1–2 mm wide, pubescent like rachis. Corolla yellow, 60–77 mm long, externally pubescent with flexuose, glandular trichomes to 0.5 mm long, tube (from base of corolla to point of attachment of stamens) 37–49 mm long, throat 12–15 mm long, neither well differentiated from tube nor saccate, 8–9.5 mm in diameter near midpoint, limb 24–29 mm in diameter with lobes subelliptic, 9–11 mm long, 7.5–10 mm wide. Stamens exserted, 19–28 mm long, thecae 5.5–6.6 mm long; pollen (Fig. 2f) spherical, 3-porate, surface reticulate-homobrochate, lumina filled with low rounded bumps. Style 65–82 mm long, pubescent with eglandular trichomes; stigma lobes unequal, one 1.5–2 mm long, the other 0.5–1.2 mm long. Capsule (possibly immature) clavate, 18–19 mm long, glabrous, stipe 4–7 mm long, head 12–14 mm long. Seeds not seen.

Phenology. Flowering and fruiting: December.

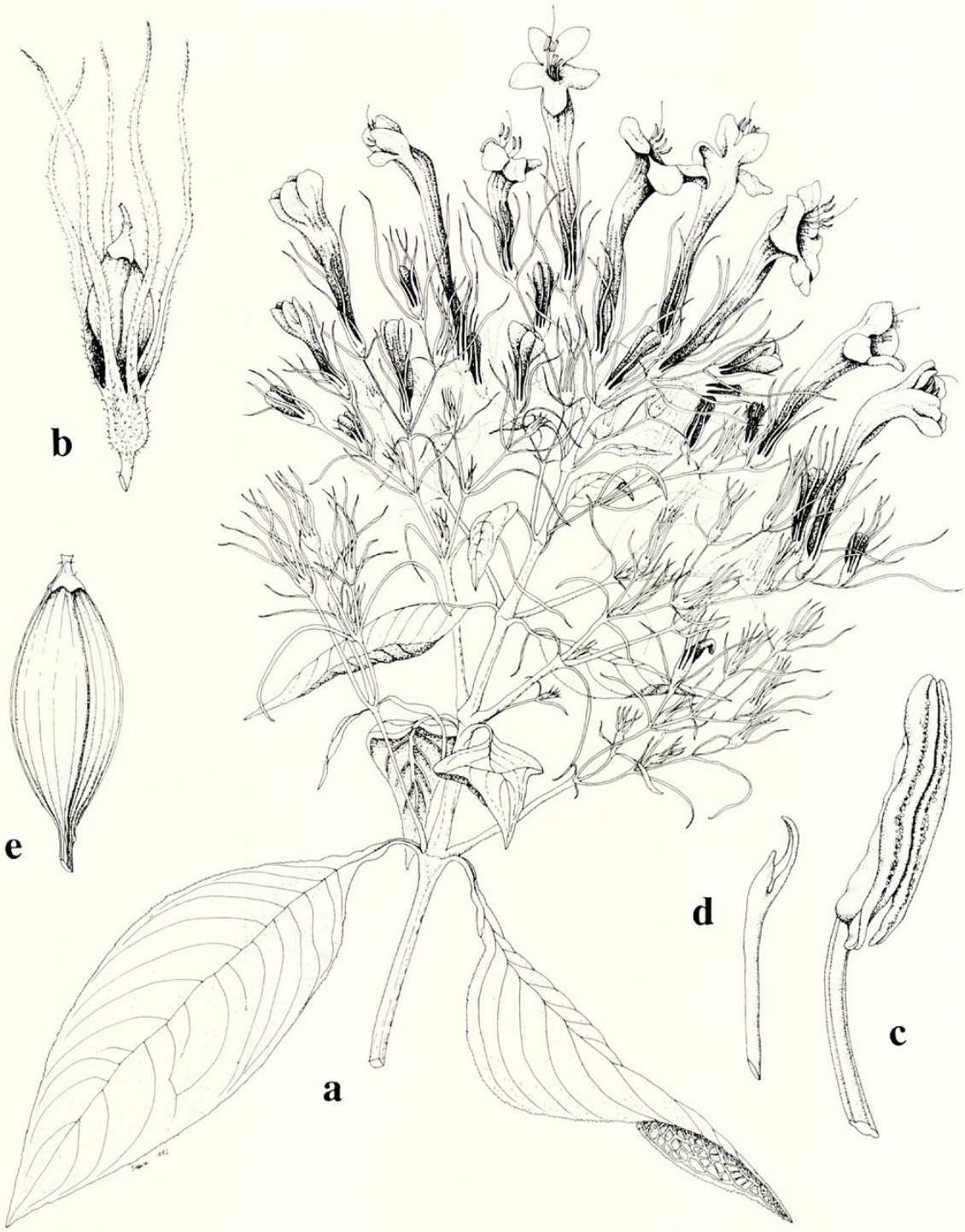

FIG. 5. *Ruellia guerrerensis* (*Hinton et al. 11296*). a. Habit with flowers, ×0.5. b. Calyx and immature capsule, ×1.5. c. Distal portion of stamen, ×6. d. Distal portion of style and stigma, ×4.8. e. Capsule, ×2.1. Drawn by Sheva Myers.

Distribution (Fig. 3). Southwestern Mexico (northwestern Guerrero); in a region dominated by oak woodland; ca. 1300 m.

This species is morphologically similar to *Ruellia jaliscana* Standley and *R. sarukhaniana* Ramamoorthy. All three species occur in montane regions of southwestern Mexico. The slight differences in floral form among them suggest specialization for somewhat different pollinators. Unfortunately, floral visitors to these species remain unreported. The three species can be distinguished from one another by the following key.

1. Corolla throat not well differentiated from tube, 12–15 mm long, 8–9.5 mm in diameter near midpoint, the limb 24–29 mm in diameter; thecae 5.5–6.6 mm long; Guerrero. *R. guerrerensis.*
1. Corolla throat subsaccate to saccate, well differentiated from tube, 17–25 mm long, 12–21 mm in diameter near midpoint, the limb 35–45 mm in diameter; thecae 6–13 mm long; Jalisco and Michoacán.
   2. Leaf blades ovate to ovate-elliptic, 35–180 mm wide, 1.5–2.4 times longer than wide; corolla throat 16–21 mm in diameter near midpoint; thecae 6–9 mm long; Jalisco. *R. jaliscana.*
   2. Leaf blades lanceolate to oblanceolate, 20–38 mm wide, 5.3–6.7 times longer than wide; corolla throat 12–13 mm in diameter near midpoint; thecae 12–13 mm long; Michoacán. *R. sarukhaniana.*

Justicia torresii T. F. Daniel, sp. nov.—TYPE: MEXICO. Oaxaca. Dtto. Tuxtepec, Mpio. Santa María Jacatepec, camino a Cosolapa San Antonio, Ejido de San Felipe Tilpa, 13.3 km SO de La Reforma, 17°51'N, 96°03'W, 20 Feb 1988, *Torres C. & Cortes A. 11472* (holotype: CAS!; isotype: MEXU!). Fig. 6.

Herba perennis usque ad 4.5 dm alta. Folia petiolata, laminae ovatae vel lanceolato-ovatae, 2.5–8.5 cm longae, 1.2–4.3 cm latae, 1.6–3.3plo longiores quam latiores. Spicae in axillis foliorum, usque ad 3.0 cm longae, pedunculatae pedunculis usque ad 20 mm longis, (1–) 2–3 (–5)-florae. Bracteolae anguste lanceolatae vel lanceolato-lineares vel lanceolato-subulatae, 6–17 mm longae, 0.8–1.5 mm latae. Calyx 12–14 mm longus, subaequaliter quadrilobus lobis lanci-subulatis. Corolla lutea, (33–) 37–46 mm longa. Stamina 12–14 mm longa thecis sagittatis subaequaliter insertis, 2.8–3.2 mm longis, basi rotundatis. Capsula 24–28 mm longa, extus glandulosa. Semina 5–6 mm longa, 5–5.5 mm lata, papillosa papillis subconicis usque ad 0.5 mm longis.

Perennial herb to 4.5 dm tall; young stems subquadrate, pubescent with flexuose to antrorse to antrorse-appressed, eglandular trichomes 0.3–0.5 mm long, the trichomes ± evenly disposed or mostly concentrated in 2 lines. Leaves petiolate; petioles to 6 mm long; blades ovate to lance-ovate, 2.5–8.5 cm long, 1.2–4.3 cm wide, 1.6–3.3 times longer than wide, (acute to) acuminate at apex, rounded to acute at base, surfaces pubescent mostly along major veins with cauline type trichomes. Inflorescence of pedunculate, few-flowered spikes to 3.0 cm long (including peduncles and excluding flowers) from leaf axils, solitary or opposite at nodes, peduncles to 20 mm long, pubescent with cauline type trichomes; flowers (1–) 2–3 (–5), sessile to subsessile, congested, solitary at spike nodes, pedicels (if present) to 0.5 mm long. Bracts narrowly lanceolate to lance-linear to lance-subulate, 6–17 mm long, 0.8–1.5 mm wide, abaxial surface pubescent with cauline type trichomes and distally with glands (sometimes sparse) 0.1–0.2 mm long as well. Bractlets lance-subulate to subulate, 5–13 mm long, 0.5–1.5 mm wide, pubescent like bracts although the glands usually more conspicuous. Calyx 4-lobed, 12–14 mm long, lobes lance-subulate, subequal, 9–13 mm long, 1.4–1.6 mm wide, abaxially pubescent like bracts. Corolla yellow, (33–) 37–46 mm long, externally pubescent with flexuose, eglandular trichomes 0.2–0.7 mm long, tube (23–) 26–31 mm long, gradually ampliate distally, internally pubescent with reflexed trichomes (sparsely so distally, densely so near base), upper lip 10–16 mm long, entire at apex, lower lip 10–17 mm long with 3 subelliptic lobes 1.4–4 mm long, 1.5–3 mm wide, rounded at apex. Stamens 12–14 mm long, inserted 2–3 mm proximal to mouth of corolla, filaments glabrous, thecae sagittate, subequally inserted, 2.8–3.2 mm long, lacking

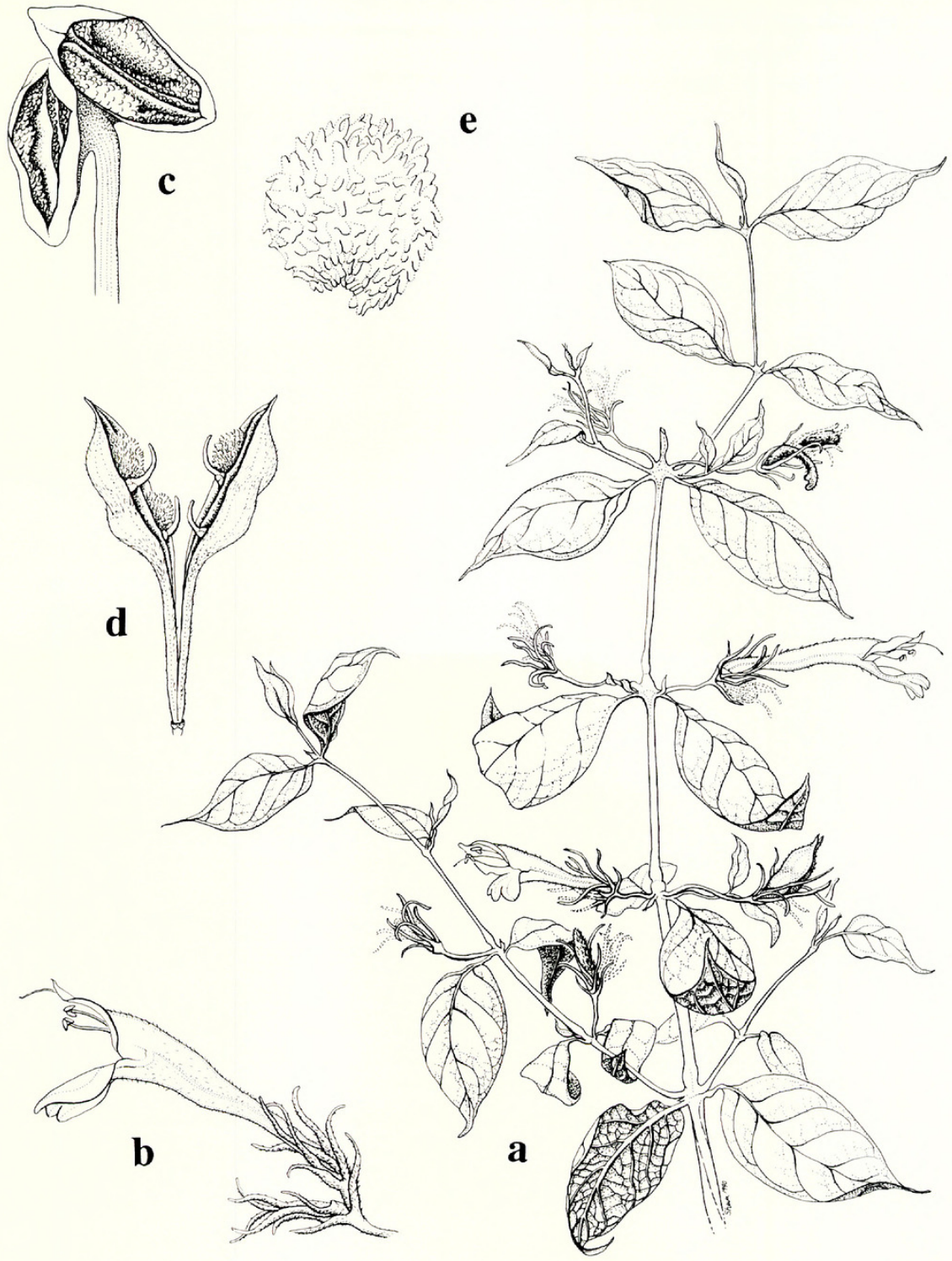

FIG. 6. *Justicia torresii* (*Torres C. & Cortes A. 11472*). a. Habit, ×0.6. b. Dichasium with flower, ×1. c. Distal portion of stamen, ×9. d. Capsule, ×1.5. e. Seed, ×5. Drawn by Sheva Myers.

basal appendages; pollen (Fig. 7d) prolate, 2-colporate with pores in a trema region with 4–6 rows of circular insulae, surface reticulate. Style 35–39 mm long, sparsely pubescent proximally, glabrous distally; stigma subspheric, 0.3–0.4 mm long. Capsule 24–28 mm long, pubescent with straight to retrorse, glandular and eglandular trichomes 0.1–0.3 mm long, stipe 7–11 mm long, head ellipsoid with a slight medial constriction, 16–18 mm long. Seeds 4, green turning brown, flat,

subcircular, 5–6 mm long, 5–5.5 mm wide, surface and margin covered with stout subconic subflexuose papillae to 0.5 mm long, papillae covered with minute spiny projections less than 0.05 mm long.

Phenology. Flowering and fruiting: February.

Distribution (Fig. 3). Known only from northern Oaxaca, Mexico; in lowland rain forest; 300 m.

PARATYPES. **Mexico.** OAXACA: seeds of type (*Torres C. & Cortes A. 11472*) grown at San Francisco Conservatory of Flowers in 1990–1991, *Daniel s.n.* (CAS, DUKE, ENCB, K, MEXU, MICH, MO, NY, RSA, TEX, US).

Justicia torresii is unlike other Mexican and Central American species of the genus and cannot be associated with a subgeneric taxon using the classification of Graham (1988). It has pollen (Graham's "type 7") similar to that found in several sections of the genus (Graham 1988).

Justicia valvata T. F. Daniel, sp. nov.—TYPE: MEXICO. Veracruz: Mpio. Hidalgotitlán, Km 7 camino a la Ecsuadra, 10 Sep 1974, *Dorantes et al. D-3538* (holotype: CAS!). Fig. 8.

Frutex vel arbor parva usque ad 5 m alta. Folia subsessilia vel petiolata, laminae ellipticae, 3.5-24.0 cm longae, 1.4-7.2 cm latae, 2.4-3.3plo longiores quam latiores. Spicae axillares vel terminales, secundae, paniculam formantes floribus sessilibus. Bracteae subfoliaceae, lanceolato-ellipticae vel lanceolato-lineares, 3.5-12 mm longae, 0.7-3 mm latae, caducae. Bracteolae lanceolato-lineares, 2.5-3 mm longae, 0.5-0.6 mm latae. Calyx 9-11.5 mm longus, quinquelobus lobis ovato-triangularibus, valvatis. Corolla flavovirens et purpurascens, 18-25 mm longa, extus glandulosa. Stamina 13 mm longa thecis subaequaliter insertis, 4.5-5 mm longis, basi rotundatis. Capsula ignota.

Shrub to small tree to 5 m tall from aerial roots; young stems quadrate, bifariously pubescent with antrorse, eglandular trichomes 0.2–0.4 mm long, soon glabrate. Leaves subsessile to petiolate; petioles to 15 mm long; blades elliptic, 3.5–24.0 cm long, 1.4–7.2 cm wide, 2.4–3.3 times longer than wide, intergrading with bracts, acuminate to subfalcate at apex, acute to attenuate at base, adaxial surface glabrous, abaxial surface glabrous or with scattered, eglandular trichomes at junctions of major veins. Inflorescence of axillary and terminal pedunculate spikes to 7.5 cm long (including peduncle but excluding flowers), collectively forming a terminal, leafy panicle, peduncles to 35 mm long, rachises pubescent like young stems; flowers sessile, solitary at nodes, borne along only 1 side of rachis. Bracts subfoliose, caducous, lance-elliptic to lance-linear, 3.5–12 mm long, 0.7–3 mm wide, glabrous or sparsely pubescent with antrorse-appressed, eglandular trichomes. Bractlets caducous, lance-linear, 2.5–3 mm long, 0.5–0.6 mm wide, pubescent like bracts. Calyx 5-lobed, 9–11.5 mm long, externally glabrous, lobes valvate-connate, usually each one eventually separating for about 1/2–3/4 the length of the calyx or anterior pair sometimes remaining mostly or completely fused, ovate-triangular, 2.5–3.5 mm wide at base. Corolla greenish yellow with purplish markings, 18–25 mm long, externally pubescent with glandular trichomes 0.2–0.3 mm long, tube 9–14 mm long, upper lip 8–12 mm long, emarginate, lower lip 9 mm long with 3 rounded lobes 1.3–2 mm long, 1.5–2 mm wide. Stamens 13 mm long, thecae subparallel and subequally inserted, 4.5–5 mm long, lacking basal appendages; pollen (Fig. 7e–i) prolate, 4-porate (to 4-subcolporate) with pores in

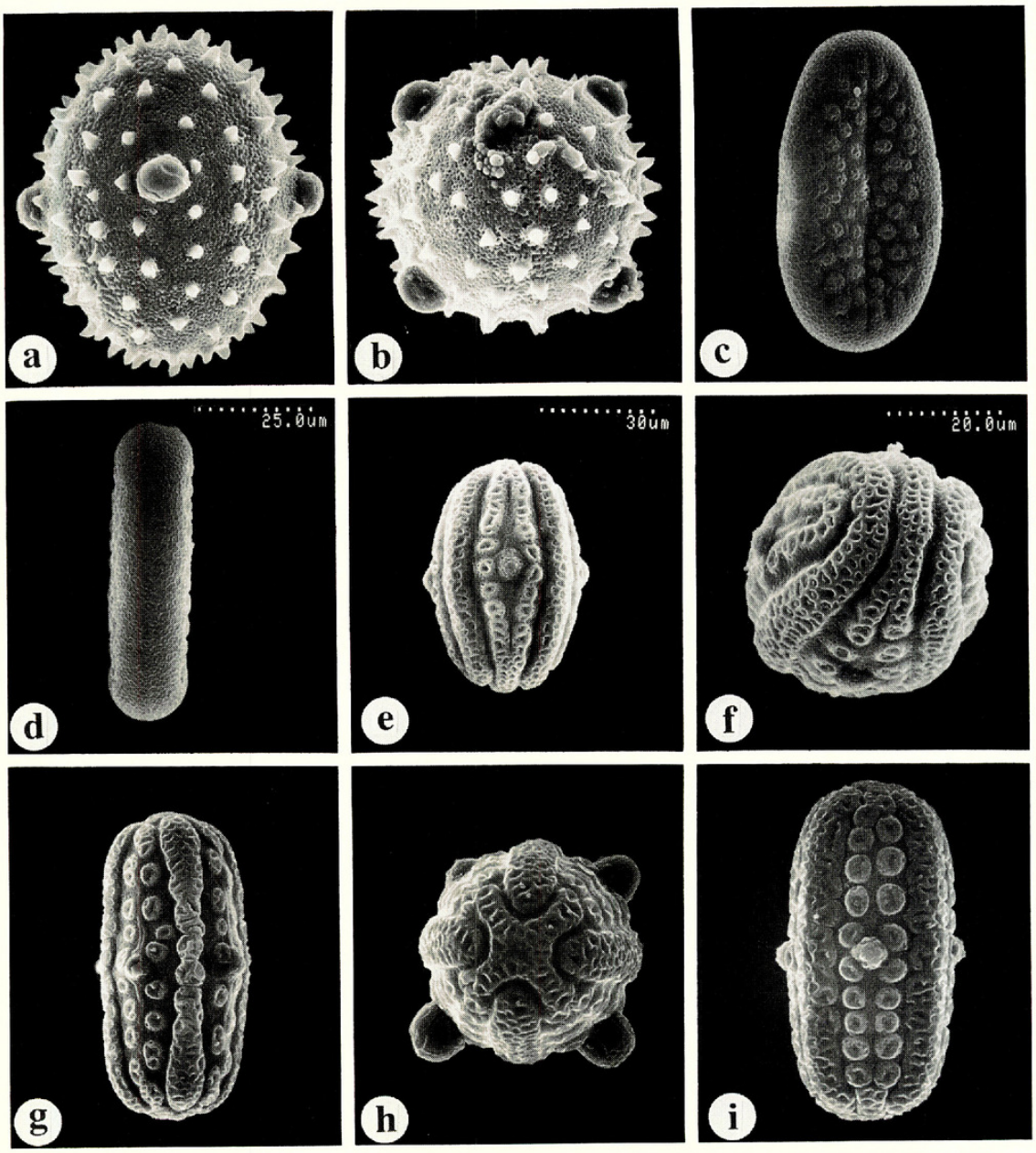

FIG. 7. Scanning electron micrographs of pollen of *Justicia*. a. *J. angustiflora* (*Rivera R. 1255*), colpal view. b. *J. angustiflora* (*Rivera R. 1255*), polar view. c. *J. torresii* (*Torres C. 11472*), colpal view. d. *J. torresii* (*Torres C. 11472*), intercolpal view. e. *J. valvata* (*Dorantes et al. D-3538*), colpal view. f. *J. valvata* (*Dorantes et al. D-3538*), subpolar view. g. *J. valvata* (*Contreras 9311*), intercolpal view. h. *J. valvata* (*Vázquez T. et al. V-2582*), polar view. i. *J. valvata* (*Vázquez T. et al. V-2582*), colpal view.

a trema region containing 2 longitudinal rows of circular insulae, surface reticulate. Style 18–24 mm long, glabrous. Capsule not seen.

Phenology. Flowering: September and November–December.

Distribution (Fig. 3). Southern Mexico (Veracruz) and northern Guatemala (Petén); lowland rain forest ; 100–150 m.

PARATYPES. **Guatemala.** PETÉN: Los Arcos, Cadenas Rd, on Km 143, W, 9 Dec 1969, *Contreras 9311* (LL). **Mexico.** VERACRUZ: Mpio. Hidalgotitlán, Benito Juárez segundo, 17°47'N, 94°39'W, 2 Nov 1978, *Castillo C. 364* (F); Mpio. Hidalgotitlán, 7 km NW del Campamento Hermanos Cedillo por la brecha a La Escuadra, 17°16'N, 94°36'W, 15 Jan 1975, *Vázquez et al. V-1752* (F); Mpio. Jesús

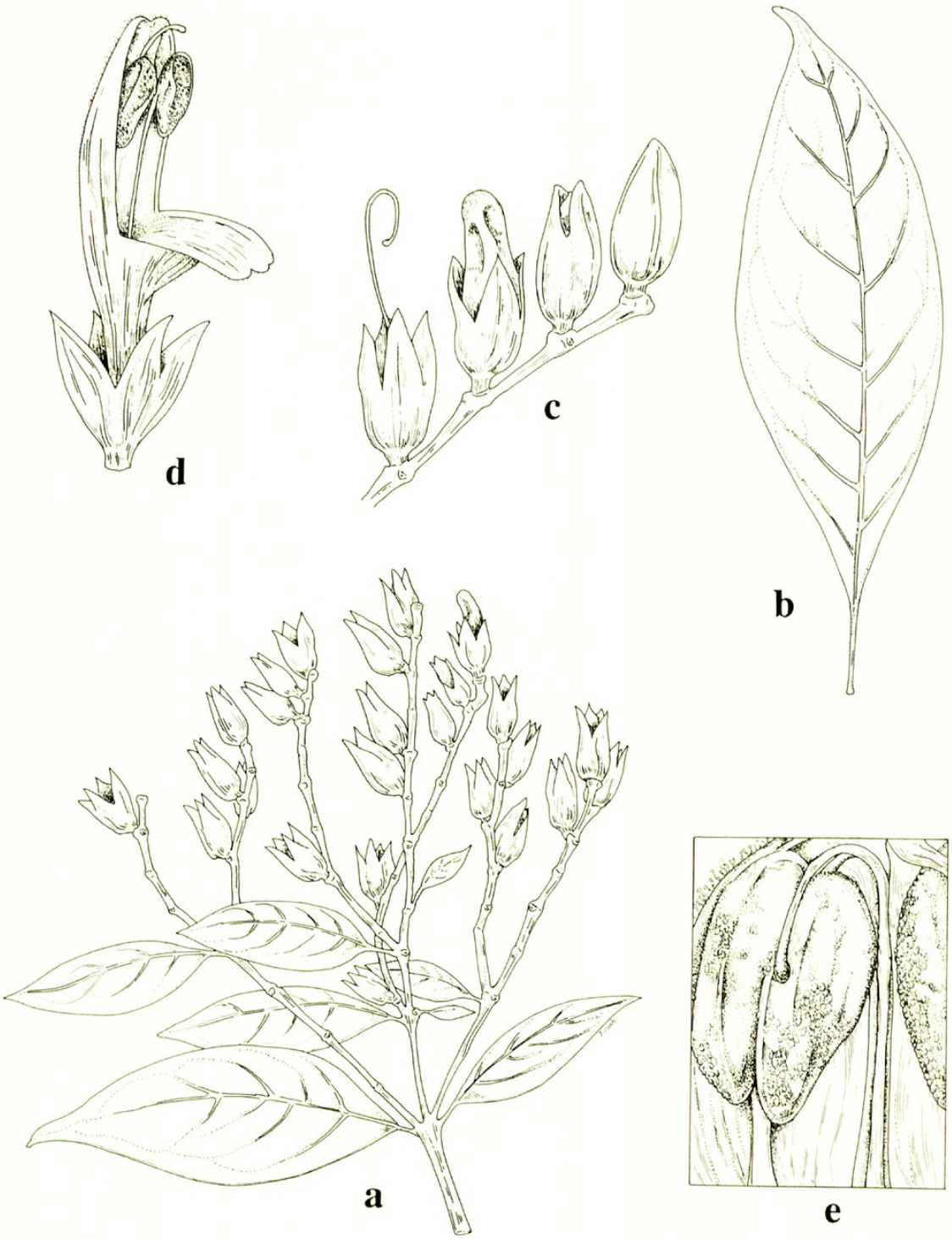

FIG. 8. *Justicia valvata*. a. Habit (*Dorantes et al. D-3538*), ×1. b. Leaf (*Vázquez T. et al. V-2582*), ×0.55. c. Portion of inflorescence with calyx in sequential stages (*Dorantes et al. D-3538*), ×2. d. Flower (*Vázquez T. et al. V-2582*), ×2.3. e. Distal portion of upper lip of corolla with stamen and style (*Vázquez T. et al. V-2582*), ×7. Drawn by Tina Cash.

Carranza, 2 km N de Poblado 2, Ejido F. J. Mina, Lat. 17°16'N, Long. 94°40'W, 25 Sep 1982, *Vázquez T. et al. V-2582* (CAS).

The likely sister species of *J. valvata* is *J. tabascina* T. F. Daniel, which occurs in similar habitats in Tabasco (Daniel 1990). Both species share the following features: caducous bracts, valvate calyces with relatively large lobes, similarly

shaped corollas with glandular pubescence, relatively large and unappendaged thecae, and 4-aperturate pollen. They may be distinguished by the following couplet:

Young stems and rachises bifariously pubescent; flowers solitary at inflorescence nodes, sessile; calyx externally glabrous. *J. valvata.*
Young stems and rachises evenly pubescent; flowers paired at inflorescence nodes, pedunculate; calyx externally pubescent. *J. tabascina.*

Some variation in pollen form was observed among the three known collections of *J. valvata*. Pollen of *Contreras 9311* from Guatemala and *Vázquez T. et al. V-2582* from Mexico (Fig. 7g–i) is virtually identical to that observed in *J. tabascina* (Daniel 1990, Fig. 2d–e). They all have well-defined insulae from near one pole to the other and a cross of polar exine separating the four bands of exine between trema regions (Fig. 7h). Pollen of the type from Mexico (Fig. 7e, f) usually has fewer discrete insulae (often only adjacent to the pores) and loops of exine not separated by a polar cross (Fig. 7f). Pollen like that of the type, in which pseudocolpi are distinct and the bands of exine between the pseudocolpi and colpi are more or less continuous or only somewhat broken up into discrete insulae, are intermediate between pollen grains typical of subtribes Justiciinae and Odontoneminae in the Justicieae.

RECONSIDERED SPECIES

Dyschoriste angustifolia (Hemsl.) Kuntze., Rev. gen. pl. 2: 485.1891. *Calophanes angustifolia* Hemsl., Biol. centr.-amer., Bot. 2: 502. 1882.—TYPE: MEXICO. See discussion for locality information, *Ghiesbreght s.n.* (holotype: K!).
Hygrophila pringlei Greenm., Proc. Amer. Acad. Arts. 41: 248. 1905. *Dyschoriste rubiginosa* Ramamoorthy & Wasshausen, Brittonia 37: 358. 1985, non *Dyschoriste pringlei* Greenm., 1904.—TYPE: MEXICO. Michoacán: hills near Uruapan, 1675 m, 13 Oct 1904, *Pringle 8847* (holotype: GH!; isotypes: CAS! UC! US!).

Ramamoorthy and Wasshausen (1985) perceptively noted that the species commonly known as *Hygrophila pringlei* properly belongs in *Dyschoriste,* and they provided the new name, *D. rubiginosa* for it. Recent botanical activities in west-central Mexico have yielded numerous collections of this red-flowered species from Colima, Jalisco, and Michoacán (Fig. 3). As a result, the geographic distribution and the morphological variability of this species are fairly well documented. Recent examination of the holotype of *D. angustifolia* revealed that it is similar in all characters to *D. rubiginosa.*

Dyschoriste angustifolia was known only from the type, a collection of A. Ghiesbreght purportedly from Oaxaca in southern Mexico (Hemsley 1882, Kobuski 1928). The holotype of *D. angustifolia* bears a printed label with the heading "Herb. Mus. Paris.," and two lines at the bottom "Mexique, Province d'Oaxaca. M. Ghiesbreght, 1842." McVaugh (1972) noted that 1842 is likely the date of receipt in Paris, not the date of collection, and that these labels were probably distributed from Paris with sets of Ghiesbreght's duplicates without an attempt to add field data to the specimens. Specimens at P commonly have additional handwritten labels with precise locality information. These reveal that plants with the printed "Oaxaca" label were sometimes collected in other Mexican states

(e.g., Morelos, Michoacán; see McVaugh 1972). At my request, Dr. Ph. Morat at P sent me photocopies of Ghiesbreght's collections of *Dyschoriste*, *Calophanes*, and *Hygrophila*. Unfortunately, none of the four specimens of which photocopies were received resemble the type at K. Three of them do have more precise locality data (e.g., "près de Cuernavaca"). A thorough search at P would undoubtedly yield an isotype of Ghiesbreght's collection. It seems probable, however, that the type of *D. angustifolia* was not collected in Oaxaca, where this conspicuous plant is not known to occur, but rather in Michoacán or adjacent regions of Colima and Jalisco, where the species is not uncommon in regions of pine and/or oak forests at elevations from 1300 to 2100 meters. It is known, for instance, that Ghiesbreght collected near Apatzingán, Michoacán (McVaugh 1972); *D. angustifolia* is known to occur near there.

Kobuski (1928) used the following combination of character states to distinguish *D. angustifolia* from all other species of the genus in his key: plants with eglandular trichomes and with stems villous-hirsute, leaves linear to linear-lanceolate and greater than 3 mm wide, inflorescences consisting of clusters of flowers at the nodes, and corollas 25–30 mm long. All of these features fall within the range of morphological variation evident among plants treated as *D. rubiginosa* by Ramamoorthy and Wasshausen (1985). The true color of the corolla of Ghiesbreght's type collection is not known with certainty. The dried corollas of the holotype are dark orange-brown. Corollas of collections identified as either *D. rubiginosa* or *Hygrophila pringlei* that did not retain their true color after drying likewise are dark orange-brown. Corollas of blue-flowered species of *Dyschoriste* that do not retain their true color after drying tend to be conspicuously lighter brown or straw colored on herbarium specimens.

Perhaps the closest relative of *Dyschoriste angustifolia*, and the only other Mexican species of the genus with reddish corollas, is *D. mcvaughii* T. F. Daniel. Distinctions between these two species were discussed by Daniel (1990).

Ruellia gooddingiana Nelson, Amer. J. Bot. 18: 437. 1931.—TYPE: MEXICO. Sonora: La Ciénega, 18 Jul 1911, *Goodding 959* (holotype: RM!).

Nelson (1931) described *R. gooddingiana* and noted a relationship with *R. tuberosa* L. He considered the possibility that his new species might be "*R. tuberosa longiflora* Gray" but noted that the former lacks the "velvety pubescence" of the latter. The only infraspecific taxon that Asa Gray described in *R. tuberosa* was *R. tuberosa* var. *occidentalis* A. Gray. It is likely that Nelson was referring to this taxon (rather than, for instance, *R. ciliosa* var. *longiflora* A. Gray), because in the protologue, Gray (1878) described the foliar vesture as "glabrate to velvety-pubescent." The type of *R. gooddingiana* was collected under mesquite in or near La Ciénega in 1911. La Ciénega is located in northwestern Sonora, approximately 150 km southwest of the international border at Nogales. Leonard (1964) did not include this name in his treatment of *Ruellia* for the Flora of the Sonoran Desert. Examination of the holotype at RM reveals this plant to belong to *R. nudiflora* (Engelm. & A. Gray) Urban, a species occurring from Arizona to Louisiana in the United States and southward throughout much of Mexico and Central America to Costa Rica (Daniel 1984a). Leaves of this specimen are sparsely pubescent to glabrate, a feature which certainly fits within the range noted by Gray (1878) for *Ruellia tuberosa* var. *occidentalis*. In fact, Gray

noted that collections from southern Arizona represented glabrate forms of the variety. Leonard (1927) included *R. tuberosa* var. *occidentalis* in *R. nudiflora* and treated the glabrate collections, including a specimen of *Goodding 959* as *R. nudiflora* var. *glabrata* Leonard. Daniel (1984a) recognized *R. nudiflora* as a variable species and listed both *R. tuberosa* var. *occidentalis* and *R. nudiflora* var. *glabrata* as synonyms. The name *R. gooddingiana* is herewith likewise included in the synonymy of *R. nudiflora*.

Ruellia rosea (Nees) Hemsl., Biol. centr.-amer., Bot. 2: 507. 1882. *Ophthalmacanthus roseus* Nees in DC., Prodr. 11: 220. 1847.—TYPE: MEXICO. Puebla: mountains near Tehuacán, 5000 ft., 1840, *Galeotti 915* (holotype: K!; isotypes: BR! LE! W!). [Homonyms: *Ruellia rosea* Mart., Obs. Mss. n. 1089, cited by Nees in Fl. Bras. 9: 61. 1847, pro syn., and DC., Prodr. 11: 215. 1847, pro syn.; *Ruellia rosea* Wall. ex Nees in DC., Prodr. 11: 177. 1847, pro syn.]

Ruellia hirsuto-glandulosa (Oerst.) Hemsl., Biol. centr.-amer., Bot. 2: 505. 1882. *Dipteracanthus hirsuto-glandulosus* Oerst., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1854: 123. 1855 (as *Diptheracanthus hirsuto-glandulosus*).—TYPE: MEXICO. Veracruz: Hacienda de Buenavista, Jun 1841, *Liebmann 10723* (lectotype, here designated: C!).

In the protologue of *Dipteracanthus hirsuto-glandulosa*, Oersted (1855: 124) cited Liebmann collections from several localities ["Paa Marker ved Hacienda de Buenaista i Dp. Vera Cruz, ved Tehuacan og S Lorenzo i Provindsen Tehuacan med Blomst og Frugt i Juni (Liebmann)"]. There are several syntypes at C annotated by Oersted with this name and with locality information corresponding to the protologue. The specimen purportedly from Veracruz is chosen as the lectotype, because it is a complete specimen with flowers and fruits, and it is the only one with a date (June) corresponding to the protologue. The syntypes from Puebla (from San Lorenzo and Tehuacán) were collected in December and May.

Hemsley (1882) indicated that *R. hirsuto-glandulosa* probably represented the same taxon as *R. rosea*. Examination of pertinent type materials bears out Hemsley's suspicion, and the former name is relegated to the synonymy of the latter. This species is distinctive among Mexican *Ruellia* by its leaves with stellate trichomes; its relatively large, purplish, and trumpet-shaped corolla; and its ± densely hirsute-glandular calyx. Pollen of the species (Fig. 2i) is typical of the genus. Although several collections from the arid Tehuacán-Cuicatlán Valley of southeastern Puebla and northwestern Oaxaca are recognizable by their longer glandular trichomes (especially on the calyx), other specimens from this region and those from Hidalgo and Querétaro with conspicuously fewer such trichomes are otherwise indistinguishable from them and are also included in this species. *Ruellia rosea* occurs, usually on limestone, in arid scrub and tropical deciduous forests at elevations from 910 to 2425 meters. It has been collected in flower and fruit from June through December. The distribution of the species is shown in Fig. 3. The lectotype locality of *R. hirsuto-glandulosa*, Hacienda de Buenavista, is located in Veracruz between Jalapa and Mirador (4 km south of Jalcomulco; see McVaugh 1987). The tropical deciduous forest in this region of Veracruz is separated from the more or less continuous arc of arid associations from Querétaro to Oaxaca (see Rzedowski 1978) from which all other collections have come.

RECENT COLLECTIONS OF LITTLE-KNOWN SPECIES

Justicia angustiflora D. Gibson, Fieldiana, Bot. 34: 66. 1972. *Beloperonides macrantha* Oerst., Vidensk. Meddel. Dansk Naturhist. Foren. Kjøbenhavn 1854: 162. 1855. *Beloperone macrantha* (Oerst.) Benth. ex Hemsl., Biol. centr.-amer., Bot. 2: 516. 1882, non *Justicia macrantha* Benth.,1841.—TYPE: MEXICO. Oaxaca: Trapiche de la Concepción, Dec 1842, *Liebmann 10623* (holotype: C!).

This species was originally described as *Beloperonides macrantha* Oerst., the sole species in a genus distinguished from *Justicia* and *Simonisia* Nees (=*Justicia* fide Graham 1988) by unspecified features of corolla shape, the anthers, and the inflorescence. Bentham (1876) included the genus in *Beloperone* Nees, but it was not until six years later that Hemsley (1882) effectively made the new combination for the species in that genus. Lindau (1895) also included *Beloperonides* within *Beloperone*. Gibson (1972) provided a new name for this species on transferring it to *Justicia*.

The species has hitherto been known only from collections made in Oaxaca during 1842 by Liebmann (Oersted 1855). There are Liebmann collections of *Beloperonides macrantha* at C and K. The collections at C comprise three sheets of *Liebmann 10623* from the locality cited in the protologue ("Trapiche de la Conception"). From notations on the labels, it appears that two of these were collected in December (the flowering date provided in the protologue) and one was collected in November. The collection dates at this locality do not agree with Liebmann's itinerary of 1842 as provided by McVaugh (1987). Trapiche de la Concepción, a sugar plantation and distillery located near Tepitongo, between Totontepec and Comaltepec (ca. 17°18'N, 96°?'W; McVaugh 1987), is in the Sierra Juárez, to the north and east of the city of Oaxaca. McVaugh (1987) indicated that Liebmann collected here during June and July of 1842. At K, there are two Liebmann collections labeled as *Beloperonides macrantha*, one from "Lobani," Oaxaca, and the other without a locality. Lobani (or Santa María Lovani, ca. 17°31'N, 96°06'W) is located about 23 kilometers north of the type locality. McVaugh (1987) noted that Liebmann collected in this region during June through September of 1842. At W, there is a collection referable to this species with scant label data ("Oaxaca 1842"). It likely represents a duplicate of one of Liebmann's collections. The holotype is considered to be the specimen at C with label data corresponding to the information in the protologue.

A recent collection from this same region of the Sierra Juárez (Oaxaca: Distr. Mixe, Mpio. Mixistlán, Mixistlán, 17°15'N, 96°00'W, 2 Nov 1989, *Rivera R. 1255*, CAS) is referable to this species and represents the first known collection of *J. angustiflora* in almost 150 years. Plants were collected in pine-oak forest at an elevation of 2200 meters.

Pollen of *Rivera R. 1255* matches that of *Liebmann 10623* (Fig. 7a, b; see also description below). Such pollen is not otherwise known in *Justicia*. Graham (1988) described and illustrated pollen (her "Type 9") with similar exine sculpturing but with only 2 pores (or in one case 3 pores) in some species of the American section *Plagiacanthus*. She also found intermediates between this unusual pollen type and pollen more typical of the genus. Because of insufficient material, Graham (1988) did not include *Beloperonides* in her broad concept of *Justicia*. Rather, she noted that the genus appeared closely related to *Justicia* and suggested that perhaps it

should be included within it. Given the overall gross morphological similarities of *J. angustiflora* to other species of *Justicia* and the similarities in pollen sculpturing to other species included in the genus, it would appear best to maintain this species in *Justicia*. If *Beloperonides* were to be recognized as a distinct genus, the pollen would likely be the only diagnostic characteristic for it.

The following description of *J. angustiflora* substantially amplifies upon that provided by Oersted.

Herb to 2 dm tall; younger stems subquadrate to quadrate-sulcate, bifariously pubescent with flexuose-retrorse, eglandular trichomes 0.1–0.3 mm long. Leaves subsessile to petiolate; petioles to 10 mm long; blades ovate-elliptic to elliptic, 2.3–5.5 cm long, 1.0–1.9 cm wide, 2.1–3.1 times longer than wide, acute to acuminate at apex, acute to attenuate at base, surfaces discolorous, adaxial surface dark, glabrous, abaxial surface light, pubescent along major veins with eglandular trichomes, margins flat, entire. Inflorescence of terminal, pedunculate, 2–3-flowered spikes to 25 mm long (including peduncle and excluding flowers), peduncles to 10 mm long, rachis and peduncle pubescent like young stems; flowers solitary and sessile at inflorescence nodes. Bracts (the proximalmost sometimes subfoliose) obovate-spatulate, 12–15 mm long, 3.5–5.5 mm wide, apically rounded to truncate, abaxially pubescent with straight to flexuose, glandular trichomes 0.1–0.2 mm long. Bractlets spatulate, 11–16 mm long, 2.5–3.5 mm wide, apically rounded to truncate, pubescent like bracts. Calyx 5-lobed, 8–9.5 mm long, lobes lanceolate to lance-subulate, 7.5–9 mm long, abaxially glabrous, adaxially pubescent with eglandular trichomes. Corolla pinkish purple, 48–49 mm long, externally pubescent with flexuose, eglandular trichomes 0.2–0.7 mm long, tube 25–30 mm long, upper lip 19–23 mm long, internally rugulate, apically bilobed with rounded lobes to 0.5 mm long, lower lip 18.5–22 mm long with 3 subelliptic and apically rounded lobes 4.5–7.5 mm long, 4–6 mm wide, central lobe larger than laterals. Stamens 18–20 mm long, inserted near apex of corolla tube, not exceeding upper lip of corolla, filaments glabrous, thecae superposed and suboblique, 2.5 mm long, the lower with a calcarate basal spur to 0.4 mm long; pollen (Fig. 7a, b) prolate, 4-porate, surface evenly echinate with longitudinal rows of stout spines. Style 45 mm long, glabrous; stigma subspheric, 0.2 mm long. Capsules not seen.

Phenology. Flowering: November–December.

Distribution (Fig. 3). Southern Mexico (north-central Oaxaca); in pine-oak forests; ca. 2200 m.

Specimens from Chiapas treated as *Justicia angustiflora* by Daniel (1986a) represent a similar, though distinct, undescribed species.

Pseuderanthemum pihuamoense T. F. Daniel, Madroño 31: 86. 1984.—TYPE: MEXICO. Jalisco: ca. 12–13 km SW of Pihuamo [ca. 19°15'N, 103°25'W], 19 Nov 1970, *McVaugh 24459* (holotype: MICH!).

This unusual species was described on the basis of two fruiting specimens from southeastern Jalisco (Daniel 1984b). Because corollas and stamens were not known, placement of the species in *Pseuderanthemum* was somewhat tentative. Recent collections of *P. pihuamoense* in a nearby region of Jalisco [Mpio. Zapotitlán, Lago La María, N and E sides of lake, ca. 22 km (airline) NNW of Colima in SW foothills of Volcán de Colima, 19 Mar 1991, *Sanders et al. 10697A*, UCR] and adjacent northern Colima [Mpio. Comala, Rancho El Jabali (ca. 1.5 km E of Hacienda San Antonio), ca. 4 km E of ranch headquarters, 19°26'N, 103°41'W, 20

May 1991, *Daniel et al. 6283*, CAS, K, MEXU, MICH, MO, NY, TEX, US] extend the range of the species and provide flowers for the first time. Characteristics of the corolla and androecium confirm the placement of this species in *Pseuderanthemum*. Plants at the locality in Colima were locally frequent in a cafetal with an overstory of *Fraxinus*, *Juglans*, and *Coussapoa* at an elevation of about 1300 meters. The dominant vegetation in this border region of Jalisco and Colima is mesophytic montane forest (Rzedowski & McVaugh 1966). A description of floral features that augments the other morphological information provided by Daniel (1984b) is provided below.

Corolla subsalverform, pink with white at base of central lobe of lower lip, 21–29 mm long, externally pubescent with straight to flexuose to retrorse, eglandular and glandular trichomes 0.1–0.3 mm long, tube subcylindric (somewhat hourglass-shaped, i.e., narrowest near midpoint), 15–18 mm long, limb bilabiate, upper lip 5–9.8 mm long, bilobed, lobes elliptic, 4.6–9 mm long, 2.8–4 mm wide, apically rounded, lower lip 6.5–11 mm long, trilobed, lobes elliptic, 6–10 mm long, 3–5 mm wide, apically rounded. Stamens inserted in distal 1/3 of corolla tube, included, 3 mm long, thecae 1.8–2 mm long; pollen (Fig. 2) syntricolporate, 6-pseudocolpate, the 2 pseudocolpi in each mesocolpium fused into a pseudocolpal ellipse, surface reticulate; staminodes 2, 1.3 mm long. Style included, 10–14 mm long, glabrous; stigma 0.5 mm long, unequally bilobed.

This species, which was last collected by McVaugh in 1970, is perhaps not as rare as suggested by the few known collections. In northern Colima, plants occur in a disturbed habitat (i.e., a coffee plantation with the native overstory intact) with at least one other rarely collected, but widely distributed, species of Acanthaceae (i.e., *Dicliptera nervata* Greenm.). The practice of preserving most, or at least some, of the native overstory trees in coffee plantations has the ecological advantage of preserving part of the natural biological community. In addition to the many epiphytes in the overstory trees, those native understory herbs and shrubs that can tolerate some disturbance often persist as well.

Tetramerium guerrerense T. F. Daniel, Syst. Bot. Monogr. 12: 101. 1986.—TYPE: MEXICO. Guerrero: Distr. Galeana, Atoyac, 3 Dec 1937, *Hinton et al. 11000* (holotype: GH!; isotypes: ENCB! LL! MICH! NY! RSA! UC! US!).

This species was based solely on the type collection from seaward slopes of the Sierra Madre Sur near Atoyac, Guerrero (Daniel 1986b). A recent collection of *T. guerrerense* from a nearby region in Guerrero (Mpio. Atoyac, between Atoyac and Puerto del Gallo, 6.4 km NE of Los Parotas, 6 Jan 1990, *Daniel & Ton 6142*, CAS, DUKE, ENCB, K, MEXU, MICH, MO, NY) represents the second known collection of this species. The latter collection was made in a region of tropical subdeciduous forest at an elevation of 275 meters. In morphological features, plants from the recent collection do not significantly alter the description provided by Daniel (1986b). Fifty-three years since it was last collected in the region, *T. guerrerense* still persists in the dry forests of west-central Guerrero.

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