

NEW AND RECONSIDERED MEXICAN ACANTHACEAE. III. JUSTICIA

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Justicia L. is the largest genus of Acanthaceae with between 420 (Mabberley 1987) and 600 (Graham 1988) species worldwide. It is the largest genus of Acanthaceae in Mexico with approximately 75 indigenous species. Recent collections from central Guerrero, Mexico, yielded two interesting species of the genus, one undescribed and one originally described in *Beloperone*. The former is described below and the latter is transferred to *Justicia*. Additional collections of each species were located in American herbaria.

Justicia alopecuroidea T. F. Daniel, sp. nov.

Fig. 1.

TYPE. MEXICO. Guerrero: stream valley along Hwy 95 between Chilpancingo and Tierra Colorada, ca. 40 km S of Chilpancingo, 11 Mar 1987, *Daniel & Bartholomew 4980* (holotype: CAS!; isotypes: ENCB! K! MEXU! MICH! NY! US!).

Herba perennis usque ad 1 m alta. Folia subsessilia vel brevipetiolata petiolis usque ad 4 mm longis; laminae ovatae, 22–125 mm longae, 9–43 mm latae, 1.8–4.2-plo longiores quam latiores. Spicae axillares, dense bracteatae, subquadrangulares, usque ad 9.5 cm longae. Bracteae bicolores, ovatae, 7–9 mm longae, 2.2–3.2 mm latae, glandulosae-pubescentes. Bracteolae lanceolato-lineares vel lanceolatae, 7–10 mm longae, 1.2–1.6 mm latae. Calyx 7–13 mm longus, inaequaliter quinquelobus lobis lanceolatis vel lanceolato-linearibus vel anguste ellipticis. Corolla atroroseopurpurea, 23–25 mm longa. Stamina 8–9.5 mm longa thecis inaequaliter insertis, theca inferior calcarata. Capsula brevistipitata, 7–8 mm longa, glandulosa-pubescent. Semina usque ad 4, papillosa.

Many-stemmed perennial herb to 1 m tall. Young stems subquadrate, pubescent (sometimes sparsely so) with retrorse, eglandular trichomes 0.2–0.6 mm long, the mature stems becoming glabrate, the epidermis often exfoliating on older stems. Leaves subsessile to short-petiolate, the petioles to 4 mm long, the blades subcoriaceous, ovate, 22–125 mm long, 9–43 mm wide, 1.8–4.2 times longer than wide, rounded to cordate at base, acuminate to subfalcate at apex, the surfaces glabrous, the margin entire, often ciliolate with trichomes to 0.1 mm long. Inflorescence of axillary, subquadrangular, densely bracteate spikes to 9.5 cm long, 8–12 mm wide, these sometimes clustered along distal portion of shoot, the rachis pubescent with a mixture of eglandular and stipitate glandular trichomes 0.05–0.2 mm long (glandular-pubescent), the flowers sessile in axil of 2 bractlets and a bract. Bracts imbricate, proximally green, distally purplish, ovate, 7–9 mm long, 2.2–3.2 mm wide, the abaxial surface glandular-pubescent. Bractlets lance-linear to lanceolate, 7–10 mm long, 1.2–1.6 mm wide, colored and pubescent like bracts. Calyx 7–13 mm long, unequally 5-lobed, the lobes imbricate, free nearly to the base,

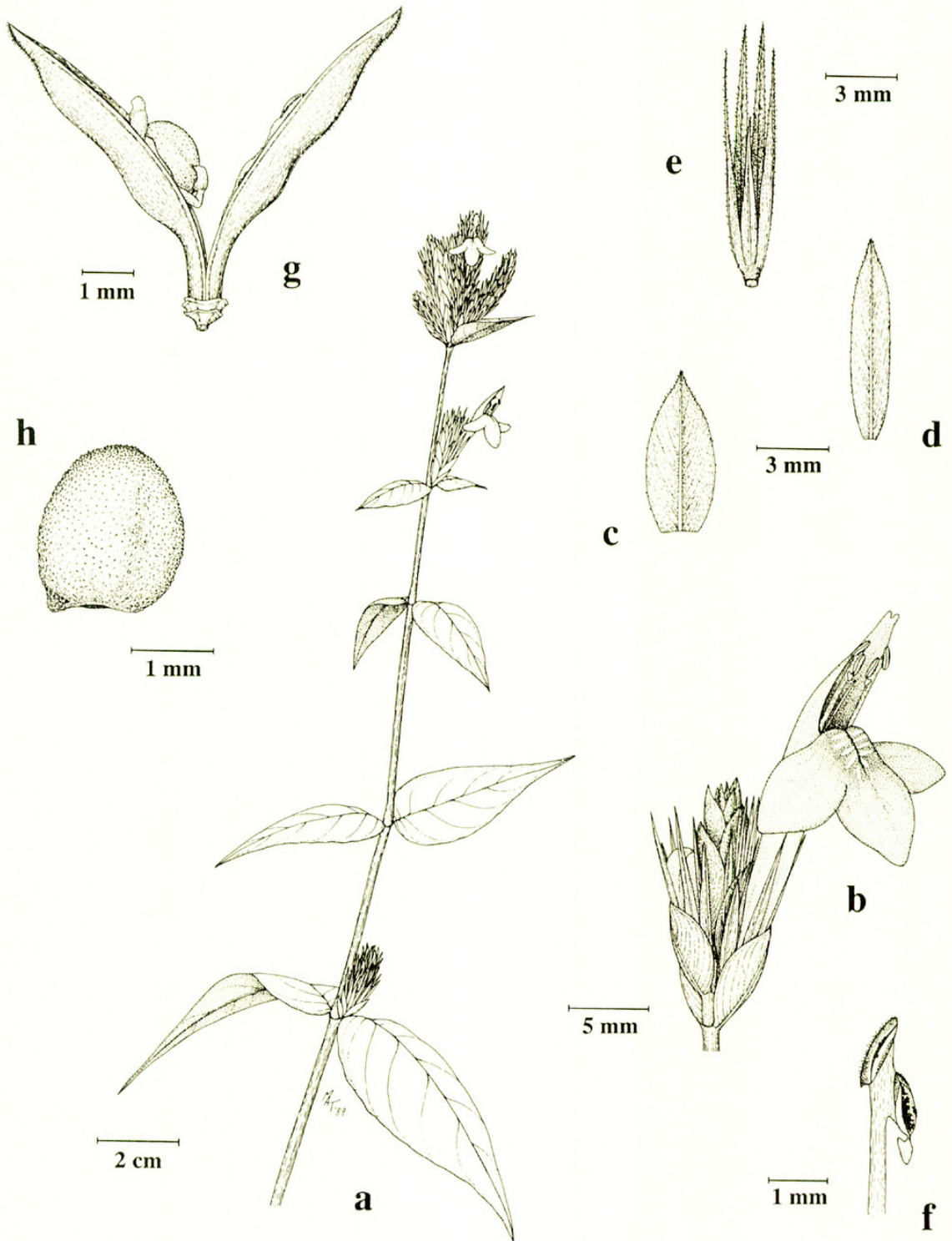


FIG. 1. *Justicia alopecuroidea* (Daniel & Bartholomew 4980). a. Habit. b. Inflorescence with flower. c. Bract. d. Bractlet. e. Calyx. f. Distal portion of stamen. g. Capsule. h. Seed.

lanceolate to lance-linear to narrowly elliptic, colored and pubescent like bracts; 4 lobes subequal, 6.5–12 mm long, 0.7–1.3 mm wide, the other greatly reduced, 3.5–6.5 mm long, 0.4–0.9 mm wide. Corolla dark rose-purple, 23–25 mm long, externally pubescent with flexuose, eglandular trichomes 0.2–0.7 mm long, the tube 13.5–15 mm long, the upper lip 8–10 mm long with 2 lobes 0.4–0.7 mm long, the lower lip 9–12 mm long with 3 elliptic lobes 4–6 mm long, 3–4.5 mm wide. Stamens

inserted in tube just below mouth of corolla, 8–9.5 mm long, the filaments glabrous, the thecae subsuperposed, rose-purple, the upper 1.3–1.5 mm long, spurless, pubescent with eglandular trichomes, the lower 1.9–2.2 mm long including a white basal spur 0.5–0.7 mm long, glabrous; pollen dicolporate with 4 pseudocolpi, the exine reticulate (Fig. 2a). Style 17–19 mm long, sparsely pubescent proximally, glabrous distally; stigma 0.2 mm long, unequally bilobed. Capsule short-stipitate, 7–8 mm long, glandular-pubescent (sometimes glabrate proximally), the stipe 1.5 mm long, the head ellipsoid, 5.5–6.5 mm long. Seeds up to 4 per capsule, flattened, broadly elliptic in outline, 2 mm long, 1.5 mm wide, the surface papillose.

Distribution and habitats. Known only from the Sierra Madre Sur in central Guerrero where plants occur on slopes under subperennial riparian forests in regions of pine and oak at elevations from 760 to 970 m.

Phenology. Flowering in February and March; fruiting in March.

PARATYPES: MEXICO. Guerrero: Hwy 95, 60.1 mi N of Diane Circle in Acapulco, *Freeland & Spetzman 201* (US); Rincón Viejo, *Kruse 175* (ENCB).

The Kruse collection was identified at ENCB as "*Justicia aff. neurochlamys*" Leonard, a Colombian species with green, ovate bracts 10 mm long and 5 mm wide and with white corollas 12 mm long (data from Leonard, 1958). I have not been able to associate any types or previous descriptions with *J. alopecuroidea*.

In the provisional key to sections and subsections of the genus that was recently provided by Graham (1988) in her study of infrageneric classification of the genus, *J. alopecuroidea* "keys" closest to sect. *Betonica* (Nees) T. Anders. subsect. *Anisostachya* (Nees) V. Graham, a taxon confined to Madagascar and tropical Africa. It is clear from the description of sect. *Betonica* that *J. alopecuroidea* does not belong there, however. *Justicia alopecuroidea* has pollen identical to that described by Graham (1988) for sections *Justicia* (Africa and the Canary Islands) and

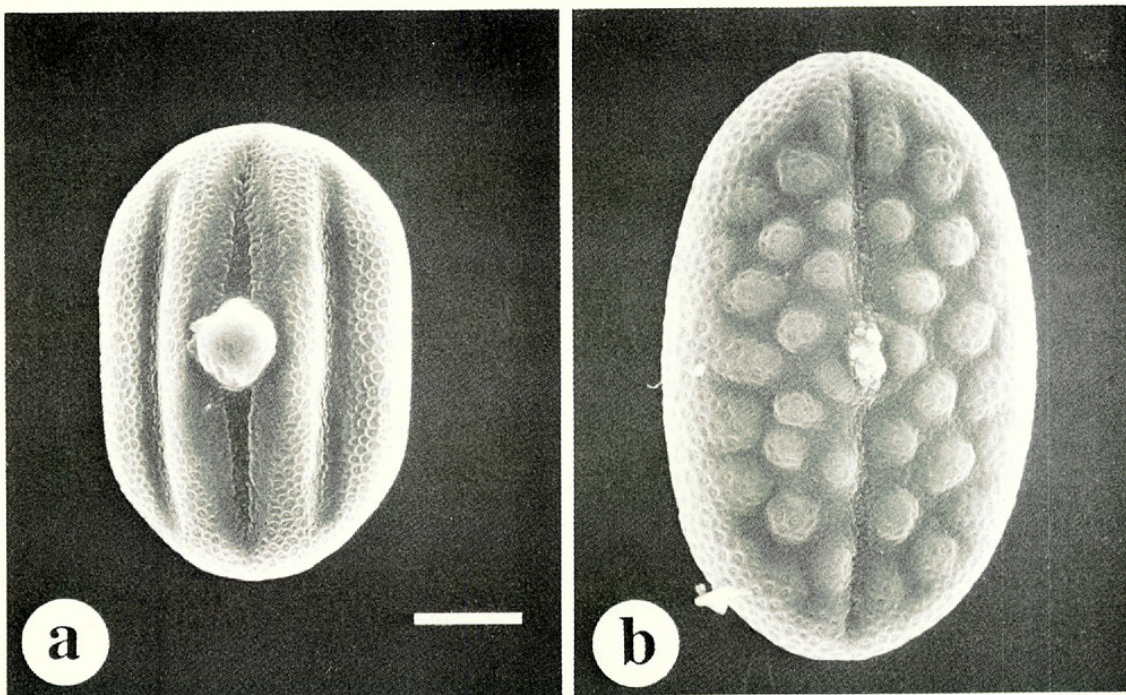


FIG. 2. Scanning electron micrographs of pollen. a. *Justicia alopecuroidea* (Daniel & Bartholomew 4980). b. *J. adenothyrsa* (Daniel & Bartholomew 4981). Scale bar = 10 μ m.

Leucoloma Graham (Paraguay and Brazil). The relatives of this species are therefore not readily evident.

The specific epithet alludes to the dense, somewhat cylindrical spikes that resemble a fox's tail.

Justicia adenothyrsa (Lindau) T. F. Daniel, comb. nov. *Beloperone adenothyrsa* Lindau, Bull. Herb. Boissier 4: 416. 1904.—TYPE. MEXICO. Guerrero: Sierra Madre, 1500 m, 19 Feb 1899, *Langlassé 902* (lectotype, here designated: F!; isolectotypes: GH, US!).

Arching shrub to 3 m tall. Young stems subterete to subquadrate, somewhat scurfy and covered with minute, inconspicuous, sessile patelliform glands, sometimes also pubescent with antrorsely or retrorsely curved, eglandular trichomes to 0.5 mm long concentrated in 2 decussate lines, and sometimes with irregular patches of flexuose, eglandular trichomes to 2 mm long. Leaves subsessile to short-petiolate, the petioles up to 4 mm long, the blades subcoriaceous, lance-ovate to ovate-elliptic, 41–150 mm long, 15–52 mm wide, 2.1–4.3 times longer than wide, becoming much reduced in size distally, rounded to cordate at base, acuminate to subfalcate at apex, the surfaces pubescent along midvein with eglandular trichomes and covered with scattered, inconspicuous, sessile, patelliform glands, otherwise mostly glabrous, the margin entire to subcrenate. Inflorescence of loose to dense, axillary spikes to 12 cm long, these forming a terminal, leafy panicle, the rachis pubescent with a mixture of eglandular and glandular trichomes to 0.6 mm long, the flowers sessile or borne on pedicels to 1 mm long in axil of 2 bractlets and a bract. Bracts dull red, often recurved and conduplicate, lanceolate, 5–16 mm long, 1.5–5 mm wide, pubescent like rachis. Bractlets dull red, lance-ovate, 2–6.5 mm long, 0.8–1.8 mm wide, pubescent like rachis. Calyx dull red, 3.5–9 mm long, 4-lobed, the lobes lance-ovate, 3–8 mm long, 0.8–1.6 mm wide, pubescent like rachis. Corolla dull red, 32–42 mm long, externally pubescent with glandular trichomes up to 0.2 mm long, the tube 19–27 mm long, the upper lip entire, 11–15 mm long, the lower lip 12–15 mm long, with 3 ovate-elliptic lobes 2.5–4.5 mm long, 1.8–3.5 mm wide. Stamens inserted in tube just below mouth, 12–16 mm long, the filaments proximally sparsely glandular, distally glabrous, the thecae superposed and more or less perpendicular to one another, the upper 1.6–2.1 mm long, spurless, the lower 1.9–2.5 mm long including a calcarate basal spur 0.3–0.7 mm long, the connective pubescent; pollen dicolporate with 2–3 irregular bands of insulae on each side of colpi, the exine reticulate (Fig. 2b). Style 24–42 mm long, proximally sparsely pubescent, distally glabrous; stigma 0.2–0.3 mm long. Capsule stipitate, 13–20 mm long, covered with glands up to 0.2 mm long, the stipe 5–8 mm long, the head ellipsoid, 8–12 mm long. Seeds 4 per capsule, flattened, subcirculate in outline, 3–3.5 mm long, 3 mm wide, the surfaces covered with rounded tubercles.

Distribution and habitats. Seaward-facing slopes and drainages of the Sierra Madre Sur in Guerrero and Oaxaca in regions of pine forest at elevations from 636 to 1500 m.

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

ADDITIONAL SPECIMENS EXAMINED. MEXICO. Guerrero: Mpio. Tlacoachixtlahuaca, Itiandoso al E de Jicayán de Tovar, *de Avila 176* (CAS); cafetal between Atoyac and El Paraíso, ca. 27 km SW of El Paraíso, *Daniel & Bartholomew 4926* (CAS, DUKE, ENCB, K, MEXU, MICH, MO, NY); between Chilpancingo and Tierra Colorada, ca. 40 km S of Chilpancingo, *Daniel & Bartholomew 4981* (CAS,

MEXU); Distr. Galeana, Plan de Carrizo, *Hinton et al.* 11034 (GH, LL, RSA, UC, US); Distr. Galeana, Río de las Selvas, *Hinton et al.* 11178 (GH, US). Oaxaca: 5–6 km NE of Putla, rd. to Tlaxiaco, *McVaugh* 22258 (ENCB, MICH).

The above description amplifies substantially that of Lindau and provides information on the fruits and seeds, which were previously unknown. In the protologue, Lindau (1904) cited two collections: *Ehrenberg* 229 from “prope Banor Gros” and *Langlassé* 902 from Guerrero. He noted that the type was at B. Unfortunately, Lindau did not indicate which of the collections cited was the type and these specimens at B were destroyed in 1943. Although it is probable that Lindau designated a specimen of one of these collections as the type, I am not aware which of them it might have been. I have not located duplicates of the Ehrenberg collection, but I have seen duplicates of *Langlassé* 902 at F and US. The duplicate at F is herewith designated as the lectotype of this species. McVaugh (1951) noted that during most of February, 1899, Langlassé collected along a trail over the Sierra Madre between Coyuquilla (17°24'N, 101°03'W) and Los Guajes (not located, but in the Balsas drainage toward Coyuca de Catlán from Coyuquilla). On the 19th of February, 1899, Langlassé began his descent back toward Coyuquilla from the summit (2230 m) of the Sierra Madre (McVaugh 1951). The lectotype of *J. adenothyrsa* was therefore collected on the Pacific slope some 730 meters below the summit.

Both of the Hinton collections cited above were annotated as an undescribed species of *Beloperone* Nees. Species of *Beloperone* are now generally recognized as belonging to *Justicia*. Graham (1988) included *Beloperone* in the synonymy of *Justicia* sect. *Plagiacanthus* (Nees) V. Graham. Lindau (1904) noted that this species was well distinguished by its glandular inflorescences. According to Graham's (1988) provisional key, *J. adenothyrsa* would belong in or near sect. *Sarotheca* (Nees) Benth. It differs in minor characters from her description of that section (e.g., bracts not subulate and shorter than calyx, and corolla neither pink to purple nor greenish yellow) but agrees in the diagnostic features of the inflorescence, calyx, and seeds. Graham described pollen like that of *J. adenothyrsa* as “Type 7.” She noted that section *Sarotheca* has “Type 6” (i.e., with the trema region traversed by 2 rows of peninsulae) pollen or pollen intermediate between “Type 6” and “Type 7.” The related sect. *Plagiacanthus* has “Type 7” pollen, but *J. adenothyrsa* does not fit in this section with respect to the macromorphological characters noted above.

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LITERATURE CITED

- Graham, V. 1988. Delimitation and infra-generic classification of *Justicia* (Acanthaceae). *Kew Bull.* 43: 551–624.
- Leonard, E. C. 1958. The Acanthaceae of Colombia, III. *Contr. U.S. Natl. Herb.* 31: 323–781.
- Lindau, G. 1904. Acanthaceae Americanae III. *Bull. Herb. Boissier* 4: 401–418.
- Mabberley, D. J. 1987. *The plant book*. Cambridge: Cambridge University Press.
- McVaugh, R. 1951. The travels and botanical collections of Eugene Langlassé in Mexico and Colombia, 1898–1899. *Candollea* 13: 167–211.



Daniel, Thomas Franklin. 1990. "New and reconsidered Mexican Acanthaceae. III. Justica." *Contributions from the University of Michigan Herbarium* 17, 133–137.

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