

A Synopsis of *Justicia* Section *Mesoamericanae* (Acanthaceae)

Thomas F. Daniel

Department of Botany, California Academy of Sciences
Golden Gate Park, San Francisco, CA 94118; Email: tdaniel@calacademy.org

Four morphologically and palynologically similar species of *Justicia* from southern Mexico and Central America are treated as a new section of the genus, *Justicia* sect. *Mesoamericanae*. *Justicia calliantha* (Honduras), *J. nicaraguensis* (Nicaragua), *J. sulfurea* (Guatemala and El Salvador), and *J. torresii* (Mexico) share a similar inflorescence structure, floral form, and pollen type but differ from one another in vesture, size and color of the corolla, and calyx length.

With estimates of 600 species worldwide, *Justicia* is the largest genus of Acanthaceae and the largest genus of the family in the Mesoamerican region. At least 97 species have been reported from this region between the Isthmus of Tehuantepec and the eastern border of Panama (Daniel 1995, 1997, 2001, in press, unpublished). Phylogenetic relationships among species of *Justicia* and related genera were discussed by McDade et al. (2000), and additional sampling of taxa and molecular markers in the Justicieae are underway.

In an infrageneric study of *Justicia*, based on a worldwide subset of species, Graham (1988) recognized 16 sections and seven subsections. Additional sections in the genus have been recognized by Hansen (1987), Hilsenbeck (1990), Ensermu Kelbessa (1990), Immelman (1992), and Daniel (2003). The descriptive activity at the infrageneric level subsequent to Graham's (1988) account attests both to the importance of her treatment and to the morphological diversity in the genus that remained (and still remains) to be placed into a taxonomic framework. Numerous American species cannot be accommodated in any of the sections that have been previously recognized (e.g., see Daniel 1999, 2002; Daniel and Wasshausen 1990) and Graham (1988) treated numerous species as "peripheral" to her infrageneric taxa. Herewith, a group of morphologically similar and predominately Mesoamerican species of *Justicia* that cannot be accommodated in existing infrageneric taxa of that genus is accorded sectional status.

***Justicia* section *Mesoamericanae* T.F. Daniel, sec. nov.**

TYPE. *Justicia sulfurea* (Donn. Sm.) D.N. Gibson.

Herbae perennes vel frutices; inflorescentia in axillis foliorum, pedunculata, brevispicata vel breviraecemosa vel fasciculata, floribus 1–5, sessilibus vel brevipedicellatis; calyx 4-lobus, lobis aequalibus vel subaequalibus; corolla flava, aurantiaca, vel rubra, tubo ampliato gradatim apicem versus, fauce indistincta; stamina thecis basi ecalcaratis; pollinis granae 2-aperturatae; capsula 15–33 mm longa, pubescens trichomatibus glandulosis; semina tuberculata.

Perennial herbs to shrubs. Young stems multistriate with greenish striations. Inflorescence of pedunculate short-spikes, racemes, or subcapitate clusters of flowers from axils of leaves, spikes or clusters solitary or paired at nodes. Flowers sessile to short-pedicellate, 1–5 per inflorescence; calyx 4-lobed, lobes equal to subequal in size; corolla yellow, orange, or red, tube gradually expanded distally, lacking a distinct throat, \pm equal to or longer than lips; thecae lacking basal

appendages; pollen 2-aperturate, apertures flanked on each side by 2(–3) rows of \pm circular insulae, insulae and interapertural regions reticulate. Capsules 15–33 mm long, pubescent with glandular (and often eglandular as well) trichomes; seeds 4, sublenticular, covered with \pm conical tubercles.

Section *Mesoamericanae* consists of 4 species that occur from southern Mexico (lat. 17°51'N in Oaxaca) to northern Nicaragua (lat. 13°45'N in Atlántico Norte). Each of the species is relatively restricted in distribution and their distributions are not known to overlap. The species occur in a diversity of biotic communities. Macromorphological and palynological characters of the section are shown in Figures 1 and 2, respectively.

The section is distinguished by the combination of axillary, pedunculate, and few-flowered inflorescences; more or less equally 4-lobed calyces; relatively large corollas with the tube gradually expanded distally; diaphragm pollen; and glandular pubescent capsules. The greenish (turning brown with age) seeds bearing prominent tubercles may also be characteristic of the section, but seeds remain unknown for two of the species.

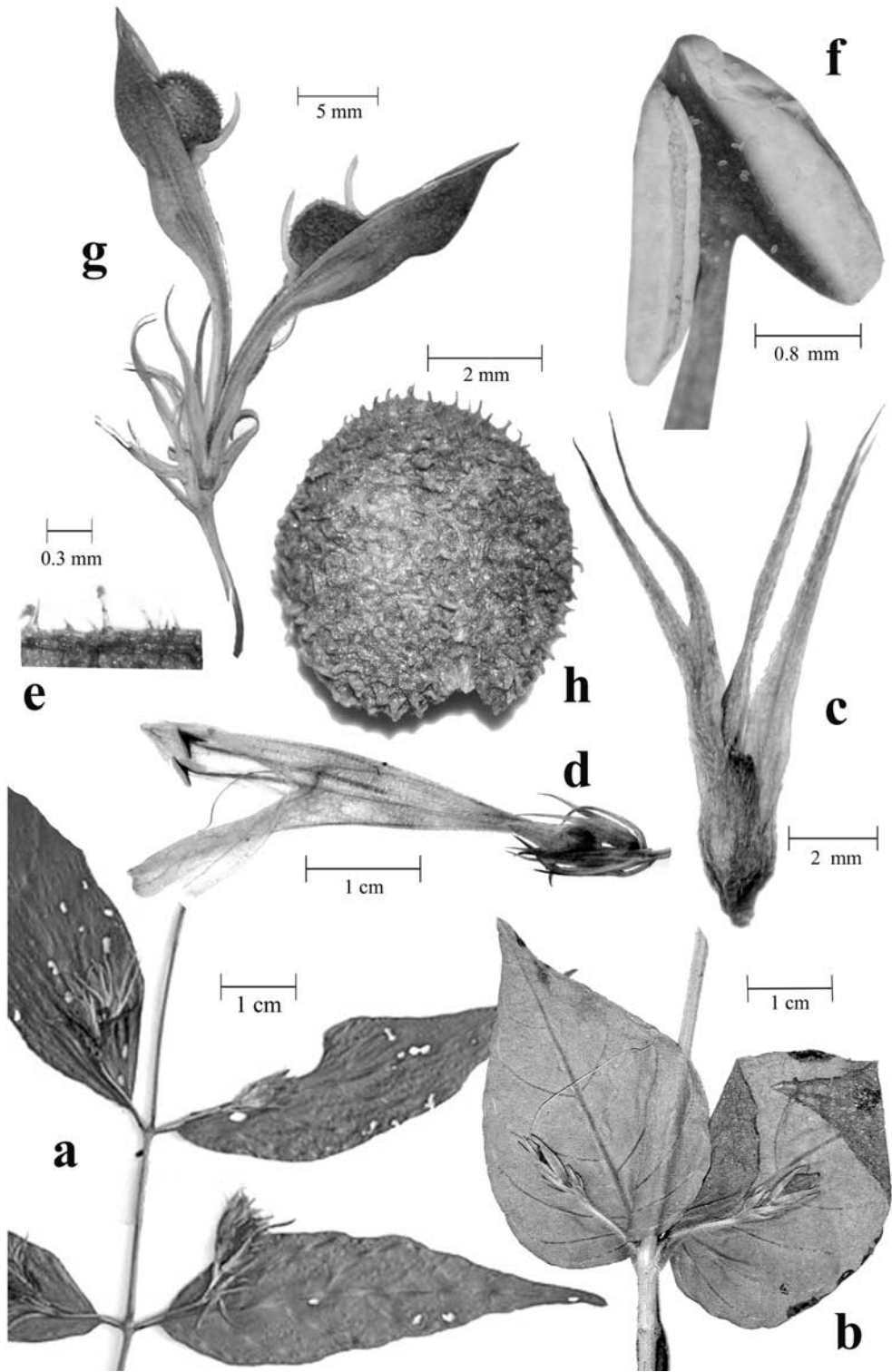
The inflorescence is a few-flowered spike or raceme of alternate, sessile, single-flowered dichasia subtended by two bracteoles in the axil of a bract. The flowers are sessile (spikes) to short-pedicellate (racemes). The fertile portion of the spikes is often reduced with the rachis between bract-bearing nodes very short or nearly absent. When the rachis is not evident, the spikes appear as pedunculate clusters of flowers and the distinction between bracts and bracteoles is then difficult to discern. The entire inflorescence is sometimes partially or entirely enclosed by revolute leaves.

Diaphragm pollen in *Justicia* is secondarily bilateral in symmetry and somewhat more complicated to describe than radially symmetric pollen (see Daniel 1998). Pollen in section *Mesoamericanae* has a P:E in apertural view of 1.404 to 2.021 and a P:E in interapertural view of 3.711. Because the ratio of the longer equatorial axis to the shorter equatorial axis is 1.90 (based on grains of *J. torresii* only), the pollen can be characterized as globose-oblong (Walker and Doyle 1975). Pollen among the four species of section *Mesoamericanae* is remarkably uniform in sculptural characteristics (Fig. 2).

Using Graham's (1988) key to and descriptions of sections of *Justicia*, plants treated here would appear most similar to species in section *Drejerella* (Lindau) V. Graham (i.e., with inflorescences short-pedunculate and consisting of fewer than seven flowers and with red to yellow flowers 24 to 63 mm long). Species of section *Mesoamericanae* differ from those in section *Drejerella* by having a 4 (vs. 5)-parted calyx, somewhat longer inflorescence peduncles (0.5–2 vs. less than 1 cm long), and 2 (vs. 3)-aperturate pollen. Pollen of species in section *Mesoamericanae* (Figure 2) conforms to that described and figured by Graham (1988) as her type 7. Such pollen is encountered in at least four of Graham's sections. One of these, section *Chaetothylax* (Nees) V. Graham, contains some species with 4-parted calyces. However, species in that section differ by having highly modified anthers (i.e., thecae oblique, unequal in size, and the lower with a basal appendage) and white, pink, blue, or wine-red corollas. The other sections with similar pollen (*Orthotactus* (Nees) V. Graham, *Plagiacanthus* (Nees) V. Graham, and *Simonisia* (Nees) V. Graham) all have 5-parted calyces and differ in various other characters as well.

Key to Species of *Justicia* sect. *Mesoamericanae*

- 1a. Corolla red, externally pubescent with glandular and eglandular trichomes; Honduras. 1. *J. calliantha*
- 1b. Corolla yellow or orange, externally pubescent with eglandular trichomes only. 2



- 2a. Cauline trichomes mostly antrorse to antrorsely appressed; calyx 11–14 mm long; thecae 2.5–3.2 mm long; Mexico. 4. *J. torresii*
- 2b. Cauline trichomes mostly retrorse; calyx 5–10 mm long; thecae 1.5–2.5 mm long; Central America. 3
- 3a. Corolla yellow, (17–) 22–29 mm long, lobes of lower lip 1.7–2.5 mm long; Guatemala and El Salvador. 3. *J. sulfurea*
- 3b. Corolla orange, 31–41 mm long, lobes of lower lip 3–4.5 mm long; Nicaragua. 2. *J. nicaraguensis*

1. *Justicia calliantha* Leonard, Ceiba 1:113. 1950.

TYPE.—HONDURAS: **Francisco Morazán:** Río Yeguaré near San Francisco, 800 m, rocky knolls, 24 November 1946, *L. Williams & A. Molina R. 10971* (holotype: US!; isotype: EAP!).

Perennial herbs or shrubs to 2 m tall or long, sometimes weak and clambering. Young stems subterete to subquadrate, evenly or bifariously pubescent with flexuose to retrorse eglandular trichomes 0.2–1 mm long. Leaves petiolate, petioles to 18 mm long, blades ovate to broadly ovate to cordate, 25–103 mm long, 16–56 mm wide, 1.1–1.9 times longer than wide, (rounded to) acute to acuminate at apex, truncate to rounded to cordate at base, surfaces pubescent (mostly along major veins) with erect to flexuose eglandular trichomes, margin entire. Inflorescence peduncles 5–17 mm long, evenly pubescent with erect to flexuose eglandular trichomes 0.1–1 mm long, flower clusters 1 per axil, 1–5-flowered, sometimes with a short rachis evident among flowers, rachis (if present) pubescent like peduncles. Bracts opposite to alternate, (lance-ovate to) subulate, 3–5.3 mm long, 0.5–1.3 mm wide, abaxial surface pubescent with an understory of erect eglandular and/or subglandular to glandular trichomes to 0.1 mm long and an overstory of erect to flexuose eglandular (and sometimes glandular) trichomes 0.2–0.5 mm long, margin similarly pubescent. Bracteoles (see discussion) subulate, 3.5–6 mm long, 0.5–7 mm wide, abaxial surface and margin pubescent like bracts. Flowers sessile to short pedicellate (i.e., pedicels to 2 mm long). Calyx 6–9.5 mm long, lobes lanceolate, 4–8 mm long, 0.8–1.3 mm wide, abaxially pubescent with an understory of erect subglandular to glandular trichomes to 0.1 mm long and an overstory of erect to flexuose glandular and eglandular trichomes 0.2–0.3 mm long. Corolla red, 29–34 mm long, external surface pubescent with erect to flexuose glandular and eglandular trichomes 0.1–0.3 mm long, tube 15–18 mm long, 2.8–3 mm in diameter near midpoint, upper lip 13–18 mm long, 2-lobed, lobes to 0.5 mm long, lower lip 16–19 mm long, lobes 0.5–3.3 mm long, 0.8–3 mm wide, central lobe largest. Stamens 14–16 mm long, filaments glabrous (at least distally), thecae 2–3.2 mm long, subparallel to perpendicular, unequally inserted (overlapping by 1.9–2 mm), unequal in size (distal theca larger), both thecae dorsally pubescent with eglandular trichomes. Style 26–31 mm long, proximally pubescent with eglandular trichomes, distally glabrous, stigma unequally 2-lobed, 1 lobe 0.2 mm long, other lobe rudimentary. Capsule 15–20 mm long, externally pubescent with erect to retrorse glandular and eglandular trichomes to 0.2 mm long, head ellipsoid with medial constriction, 9–13 mm long. Seeds 3.8–4.8 mm long, 3.5 mm wide, surfaces and margin covered with stout subconic tubercles, tubercles papillose and usually with some minute spiny projections less than 0.05 mm long.

FIGURE 1. Macromorphological characteristics of *Justicia* sect. *Mesoamericanae*. a. Leaves and inflorescences of *J. nicaraguensis* (*Stevens 6848*). b. Leaves and inflorescences of *J. calliantha* (*Molina R. 649*). c. Calyx of *J. torresii* (*Torres C. & Cortes A. 11472*). d. Fertile portion of inflorescence with flower of *J. torresii* (*Torres C. & Cortes A. 11472*). e. Pubescence of external surface of corolla of *J. calliantha* (*Molina R. 649*). f. Anther of *J. torresii* (*Daniel s.n.*). g. Inflorescence with capsule of *J. torresii* (*Torres C. & Cortes A. 11472*). h. Seed of *J. torresii* (*Torres C. & Cortes A. 11472*).

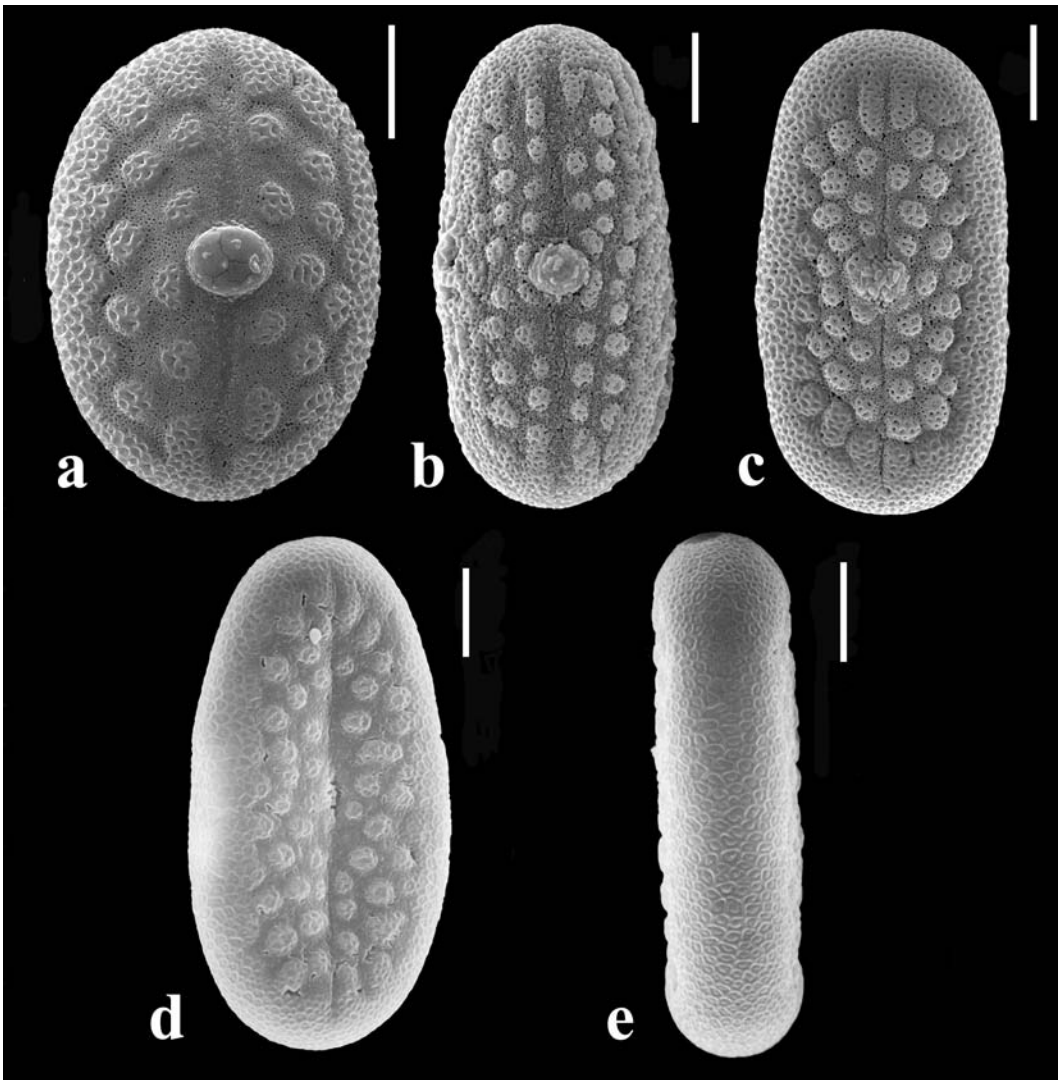


FIGURE 2. Representative pollen of *Justicia* sect. *Mesoamericanae*. a. *J. calliantha* (Molina 18571), apertural view. b. *J. nicaraguensis* (Pipoly 6289), apertural view. c. *J. sulfurea* (Molina R. & Molina 27794), apertural view. d. *J. torresii* (Torres C. & Cortes A. 11472), apertural view. e. *J. torresii* (Torres C. & Cortes A. 11472), interapertural view. Scales = 12 μ m.

PHENOLOGY.— Flowering: November–March; fruiting: December–March.

DISTRIBUTION AND HABITATS.— Endemic to Honduras (Fig. 3) where plants occur in oak forests, thornscrub, and along streams at elevations from 600 to 1050 meters.

ILLUSTRATION.— Ceiba 1:114. 1950.

ADDITIONAL SPECIMENS EXAMINED.— HONDURAS: **Comayagua:** Los Jícaros, 5 km SE de Lamaní, *B. Holst* 626 (EAP). **El Paraíso:** Quebrada Jagua, below Guayabillas, *A. Molina R.* 649 (F, GH, MO); Río Yeguaré drainage, Río Lizapa, *A. Molina R.* 5034 (F, GH); Las Casitas, *P. Standley et al.* 620 (EAP, F); Quebrada Dantas, ca. 10 km N of Yuscarán, *L. Williams* 17206 (F, GH). **Francisco Morazán:** Mpio. Tegucigalpa, ca. 4 km SE de Tegucigalpa, orilla del Río Las Canoas, *J. Linares* 1880 (MO); riveras del Río Yeguaré, ca. 14°N, 87°W, *A. Molina R.* 1794 (GH,

MO); along Río Guacerique between Los Laureles and Las Tapias, NW of Tegucigalpa, *A. Molina R. 18571* (F, NY); Río Yeguaré near El Zamorano, *P. Standley 66* (F); Río Yeguaré E of El Zamorano, Santa Clara, *P. Standley 15438* (F, GH).

Geographically and morphologically, this species is closest to *J. nicaraguensis*. They can be distinguished by the characters in the following couplet:

- 1a. Corolla red, externally pubescent with glandular and eglandular trichomes, lower lip 16–19 mm long; young stems subterete to subquadrate, evenly to bifariously pubescent; leaves 1.1–1.9 times longer than wide, truncate to rounded to cordate at base; bracts 3–5.3 mm long; thecae pubescent; capsule 15–20 mm long. *J. calliantha*
- 1b. Corolla orange, externally pubescent with eglandular trichomes only, lower lip 11–13 mm long; young stems quadrate to quadrate-sulcate, unifariously pubescent; leaves 2.2–4.5 times longer than wide, usually acute at base; bracts 6.5–11 mm long; thecae glabrous; capsule 33 mm long. *J. nicaraguensis*

2. *Justicia nicaraguensis* Durkee, *Novon 9:508. 1999.*

TYPE.—NICARAGUA: **Atlántico Norte** (“Zelaya”): along trail from Cerro Saslaya to San José del Hormiguero, between Caño Majagua and Caño Sucio, tall evergreen forest, ca. 13°45'N, 84°59'–85°00'W, 600–800 m, 10 March 1978, *W. Stevens 6848* (holotype: MO; isotype: CAS!).

Perennial herbs or shrubs to 4 m tall, sometimes clambering or vinelike. Young stems quadrate to quadrate-sulcate, unifariously pubescent with mostly retrorse (varying from flexuose to antrorse) eglandular trichomes and sometimes with a few scattered (mostly antrorse or upward pointing) eglandular trichomes as well, trichomes 0.3–0.6 mm long. Leaves petiolate, petioles to 5 mm long, blades lance-ovate to ovate to ovate-elliptic, 40–101 mm long, 16–35 mm wide, 2.2–4.5 times longer than wide, acuminate to long-acuminate at apex, (rounded to) acute (often asymmetric) at base, surfaces pubescent with antrorse to antrorsely appressed eglandular trichomes restricted to midvein (dense on adaxial surface, sparse on abaxial surface), margin entire to subsinuate. Inflorescence peduncles 7–11 mm long, ± evenly pubescent with (erect to) antrorse to flexuose (to retrorse) eglandular trichomes (0.05–) 0.3–0.6 mm long and sometimes distally with erect glands 0.05–0.2 mm long as well, flower clusters 1 per axil, 2–5-flowered, rachis sometimes evident among flowers, sparsely pubescent with eglandular trichomes like those of peduncle. Bracts lanceolate to narrowly elliptic to linear, 6.5–11 mm long, 1–1.7 mm wide, abaxial surface pubescent with antrorse eglandular trichomes 0.3–0.5 mm long (often sparse) and erect to flexuose glandular trichomes 0.05–0.2 mm long (often more prevalent distally), margin prominently ciliate with erect to flexuose eglandular trichomes to 0.8 mm long. Bracteoles lanceolate to narrowly elliptic, 6–11 mm long, 0.8–1.4 mm wide, abaxial surface and margin pubescent like bracts. Flowers sessile. Calyx 9–10.5 mm long, lobes subulate, 6.5–9 mm long, 0.8–1 mm wide, abaxially pubescent like bracts. Corolla orange, 31–41 mm long, externally pubescent with flexuose eglandular trichomes 0.2–0.7 mm long, tube 20–28 mm long, 1.7–2.5 mm in diameter near midpoint, upper lip 10.5–11 mm long, entire, lower lip 11–13 mm long, lobes 3–4.5 mm long, 1.6–2.5 mm wide. Stamens 11 mm long, filaments glabrous (at least distally), thecae 1.7–2.2 mm long, subparallel to sagittate, equally to subequally inserted, subequal in size, glabrous. Style 25–36 mm long, glabrous (at least distally), stigma 0.2 mm long, lobes not evident. Capsule 33 mm long, pubescent with erect to flexuose glandular trichomes 0.05–0.1 mm long. Seeds not seen.

PHENOLOGY.— Flowering and fruiting: March.

DISTRIBUTION AND HABITATS.— Endemic to Nicaragua (Atlántico Norte; Fig. 3) where plants

occur in evergreen primary forest and in disturbed secondary forest at elevations from 300 to 800 meters.

ILLUSTRATION.— Ann. Missouri Bot. Gard. 9:509. 1999.

ADDITIONAL SPECIMENS EXAMINED.— NICARAGUA: **Atlántico Norte** (“Zelaya”): Finca S of La Pimenta, ca. 13°45′N, 84°59′W, *J. Pipoly* 6289 (CAS, MO); trail from Cerro Saslaya to San José del Hormiguero, between Caño Sucio and Loma Mollejones, ca. 13°45′N, 84°58–59′W, *W. Stevens* 7015 (MO).

In addition to its orange corollas, this species differs from others in the section by its larger capsules with glandular (only) trichomes.

3. *Justicia sulfurea* (Donn. Sm.) D.N. Gibson, Fieldiana, Bot. 34:74. 1972. *Dianthera sulfurea* Donn. Sm., Bot. Gaz. 35:6. 1903.

TYPE.— GUATEMALA: **Santa Rosa**: Cerro Redondo, 1200 m, September 1893, *E. Heyde* & *E. Lux* 6215 (lectotype, designated by Gibson in 1972: US!; isoelectotypes: A!, F!, GH!, MO!).

Perennial herbs to 2 m. Young stems subquadrate, unifariously (to ± bifariously) pubescent with mostly retrorse (occasionally flexuose to antrorse, especially at upper nodes) eglandular trichomes 0.3–0.8 mm long. Leaves petiolate, petioles to 4 mm long, blades lance-ovate to ovate, 25–113 mm long, 8.5–31 mm wide, 2.5–4.4 times longer than wide, acuminate to long-acuminate at apex, truncate to rounded to acute to subcordate (often asymmetric) at base, surfaces pubescent with flexuose to antrorsely appressed eglandular trichomes (restricted to major veins on adaxial surface and concentrated on major veins but disposed throughout on abaxial surface), margin entire to subsinuate. Inflorescence peduncles 6–20 mm long, evenly pubescent (or with trichomes ± unifariously disposed) with flexuose to antrorse to retrorse eglandular trichomes 0.4–0.8 mm long, spikes or flower clusters 1 per axil, 1–4-flowered, rachis (if present) nearly glabrous or with sparse glandular or eglandular trichomes 0.05–0.2 mm long. Bracts subulate to lance-subulate, 4.5–7.5 mm long, 0.5–0.9 mm wide, abaxial surface and margin pubescent with erect to flexuose to antrorse to antrorsely appressed eglandular trichomes 0.3–1.3 mm long, sometimes with flexuose glandular trichomes 0.1–0.3 mm long as well. Bracteoles subulate to lance-subulate, 5–8 mm long, 0.5–0.7 mm wide, abaxially and marginally pubescent like bracts. Flowers sessile to subsessile (i.e., pedicels to 1 mm long). Calyx 5–8 mm long, lobes subulate to lance-subulate, 4.5–6.7 mm long, 0.3–1.3 mm wide, abaxially pubescent like bracts and usually with flexuose glandular trichomes (sometimes inconspicuous) 0.1–0.3 mm long present as well. Corolla yellow, (17–) 22–29 mm long, externally pubescent with flexuose eglandular trichomes 0.2–1 mm long, tube (11–) 16–20 mm long, 2.3–3 mm in diameter near midpoint, upper lip (6–) 9–12 mm long, entire, lower lip (6–) 10.5–13 mm long, lobes 1.7–2.5 mm long, 1.5–3 mm wide. Stamens 11–14 mm long, filaments glabrous (at least distally), thecae 1.5–2.5 mm long, sagittate to subperpendicular, subequally inserted, subequal in size, lower theca glabrous, upper theca sometimes with a few eglandular trichomes near base (e.g., *Molina R. & Molina* 27794). Style 26–29 mm long, pubescent near base with eglandular trichomes, glabrous distally, stigma 0.3–0.4 mm long, lobes not evident. Capsule (immature?) 14 mm long, pubescent with erect glandular (and a few eglandular) trichomes 0.05–0.1 mm long. Seeds not seen.

PHENOLOGY.— Flowering: September–October; fruiting: January.

DISTRIBUTION AND HABITATS.— Known from central and southeastern Guatemala (Baja Verapaz and Santa Rosa) and western El Salvador (Ahuachapán) where plants occur in moist thickets along rivers and on rocky slopes in disturbed forests at elevations from 1140 to 1500 meters (Fig. 3).

ILLUSTRATION.— None found.

ADDITIONAL SPECIMENS EXAMINED.— GUATEMALA: **Baja Verapaz:** Pachirax River, Sierra Chuacús, 6 km from Rabinal, road to Guatemala City, A. Molina R. & A. R. Molina 27794 (EAP, F); Cachil, A. Molina R. & A. R. Molina 27834a (EAP). EL SALVADOR: **Ahuachapán:** without locale, S. Padilla V. 640 (US); Sierra Apaneca, region of Finca Colima, P. Standley 20141 (GH, NY, US).

Gibson (1972, 1974) noted that this rarely collected species was known to her only from the type collection. Other collections resembling the type have since been collected or located. The most recent known collection of *J. sulfurea* was made in 1972 by the Molinas in Guatemala.

Molina & Molina 27794 has considerably fewer glandular trichomes in the inflorescence (i.e., restricted to calyx lobes where inconspicuous) than does the type (i.e., glands present and usually conspicuous on bracts, bracteoles, and calyx). Also in *Molina & Molina 27794*, the eglandular trichomes on the abaxial surface and margin of bracts, bracteoles, and calyx lobes are erect to flexuose and 0.6–1.3 mm long whereas in the type, the eglandular trichomes on these structures are flexuose to antrorsely appressed and 0.3–0.7 mm long. *Standley 21041* from El Salvador more closely resembles the type in these pubescence characters.

4. *Justicia torresii* T.F. Daniel, *Contr. Univ. Michigan Herb.* 18:280. 1993.

TYPE.— MEXICO: **Oaxaca:** Distr. Tuxtepec, Mpio. Santa María Jacatepec, camino a Cosolapa San Antonio, Ejido de San Felipe Tilpa, 13.3 km SW de La Reforma, 17°51'N, 96°03'W, 20 February 1988, R. Torres C. & L. Cortes A. 11472 (holotype: CAS!; isotype: MEXU!).

Perennial herbs to 4.5 dm tall. Young stems subquadrate, pubescent with flexuose to antrorse to antrorsely appressed to retrorse eglandular trichomes 0.3–0.5 mm long, trichomes \pm evenly, unifariouly, or bifariouly disposed. Leaves petiolate, petioles to 6 mm long, blades ovate to lance-ovate, 25–85 mm long, 12–43 mm 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 peduncles to 20 mm long, pubescent with cauline type trichomes, spikes (1–) 2–3 (–5)-flowered, rachis (if present) pubescent with antrorse eglandular trichomes 0.2–0.4 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, margin ciliate with (flexuose to) antrorse to antrorsely appressed eglandular trichomes 0.2–0.8 mm long. Bracteoles lance-subulate to subulate, 5–13 mm long, 0.5–1.5 mm wide, abaxial surface and margin pubescent like bracts although the glands usually more conspicuous. Flowers sessile to subsessile (i.e., pedicels to 0.5 mm long). Calyx 11–14 mm long, lobes lance-subulate, 9–13 mm long, 1.4–1.6 mm wide, abaxially pubescent like bracts. Corolla yellow, (33–) 36–46 mm long, externally pubescent with flexuose eglandular trichomes 0.2–0.7 mm long, tube (23–) 26–31 mm long, upper lip 10–16 mm long, entire, lower lip 10–17

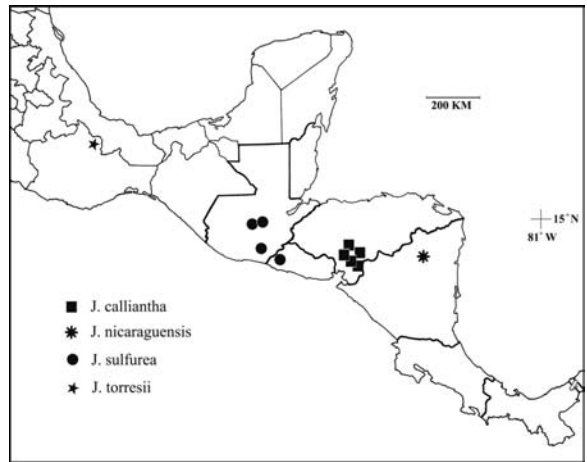


FIGURE 3. Map of a portion of Middle America showing distributions of species of *Justicia* sect. *Mesoamericanae*.

mm long, lobes 1.4–4 mm long, 1.5–3 mm wide. Stamens 12–14 mm long, filaments glabrous, thecae 2.5–3.2 mm long, sagittate, subequally inserted, subequal in size, glabrous. 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 erect to retrorse, glandular and eglandular trichomes 0.1–0.3 mm long, head ellipsoid with a slight medial constriction, 16–18 mm long. Seeds 4, green turning brown, 5–6 mm long, 5–5.5 mm wide, surface and margin covered with stout subconic and subflexuose tubercles to 0.5 mm long, tubercles striate and covered with minute spiny projections less than 0.05 mm long.

PHENOLOGY.— Flowering and fruiting: February.

DISTRIBUTION AND HABITATS.— Endemic to southern Mexico (Oaxaca; Fig. 3) where plants occur in lowland rain forest at an elevation of 300 meters.

ILLUSTRATION.— Contr. Univ. Michigan Herb. 19:281. 1993.

ADDITIONAL SPECIMENS EXAMINED.— MEXICO: **Oaxaca**: seeds of type (*R. Torres C. & L. Cortes A. 11472*) grown at San Francisco Conservatory of Flowers in 1990–1991, *T. Daniel s.n.* (CAS, DUKE, ENCB, K, MEXU, MICH, MO, NY, RSA, TEX, US).

The two species of section *Mesoamericanae* with yellow flowers appear particularly similar to one another, and additional collections may eventually show them to represent a single, variable species. Unfortunately, seeds remain unknown for *J. sulfurea*. These two species can be distinguished by the characters in the following couplet:

- 1a. Bracts 4.5–7 mm long; calyx 5–8 mm long; corolla 27.5–29 mm long; thecae 1.5–2.2 mm long; style 26–29 mm long. *J. sulfurea*
 1b. Bracts 6–17 mm long; calyx 12–14 mm long; corolla (33–) 36–46 mm long; thecae 2.5–3.2 mm long; style 35–39 mm long. *J. torresii*

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