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TAXONOMIC AND GEOGRAPHIC NOTES ON  
CENTRAL AMERICAN ACANTHACEAE

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**ABSTRACT:** *Justicia almedae* is described as a new species from a lowland rain forest in southeastern Costa Rica. Persistence of the rare Belizian endemic, *Louteridium chartaceum*, is noted. A new name, *Streblacanthus cordifolius*, is provided for the species previously known as *Streblacanthus cordatus* and *Pseuderanthemum cordatum*. *Ecbolium chamaeranthemodes* is transferred to *Justicia* and recognized as a species distinct from *J. chamaephyton*. *Streblacanthus chirripensis* is included as a taxonomic synonym of *J. chamaeranthemodes*. Lectotypes are designated for *Streblacanthus cordatus* and *S. chirripensis*. The generic position of *Justicia albobracteata* is resolved, the species is adequately described for the first time, and its known distribution is extended from Belize to Guatemala. Range extensions are reported for the following species: *Carlwrightia myriantha* (Belize), *Mendoncia guatemalensis* (Honduras), *Ruellia standleyi* (Costa Rica), *Spathacanthus hahnianus* (Honduras), *Staurogyne agrestis* (Costa Rica), *Stenandrium pedunculatum* (El Salvador), and *Streblacanthus cordifolius* (Costa Rica).

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INTRODUCTION

The comprehensive treatments of Acanthaceae for Panama and Costa Rica by Durkee (1978, 1986) have stimulated considerable interest in this family in southern Central America. Recent systematic studies by Daniel and Wasshausen (1990), Gómez-Laurito (1990), Gómez-Laurito and Grayum (1991), and Daniel and McDade (in prep.) have all built on the foundations established by Durkee. In this report, a new species of *Justicia* is described from Costa Rica, significant range extensions of Acanthaceae are reported from throughout Central America, persistence of the rare species *Louteridium chartaceum* in Belize is noted, and miscellaneous taxonomic notes on Central American Acanthaceae are provided. The taxonomic notes include nomenclatural renovations in *Streblacanthus* and

*Justicia*, and lectotypifications of *Streblacanthus chirripensis* and *S. cordatus*.

A NEW SPECIES

***Justicia almedae*** T. F. Daniel, sp. nov.

(Fig. 1)

TYPE.—COSTA RICA. Limón: Reserva Biológica Hitoy Cerere, trail from Río Cerere to Cerro Bobócara, 26 February 1991, T. Daniel, F. Almeda, & B. Bartholomew 6228 (holotype: CAS!; isotypes: CR!, MO!, US!).

Herba usque ad 3.5 dm alta. Folia petiolata petiolis usque ad 22 mm longis; laminae ovatae vel ovato-ellipticae, 43–134 mm longae, 20–68 mm latae, 1.7–3.6-plo longiores quam latiores. Spicae axillares vel terminales, pedunculares, usque ad 45 mm longae; bractae lanceolato-lineares vel anguste ellipticae, 7–9 mm longae, 1.7–3 mm latae; bracteolae lanceolato-lineares, 5–7 mm longae, 1–1.3 mm latae. Flores oppositi; calyx 10–12 mm longus, inaequaliter quinquelobus lobis lanceolato-subulatis; corolla crenea, 14.5–15 mm longa; stamina 9.5 mm



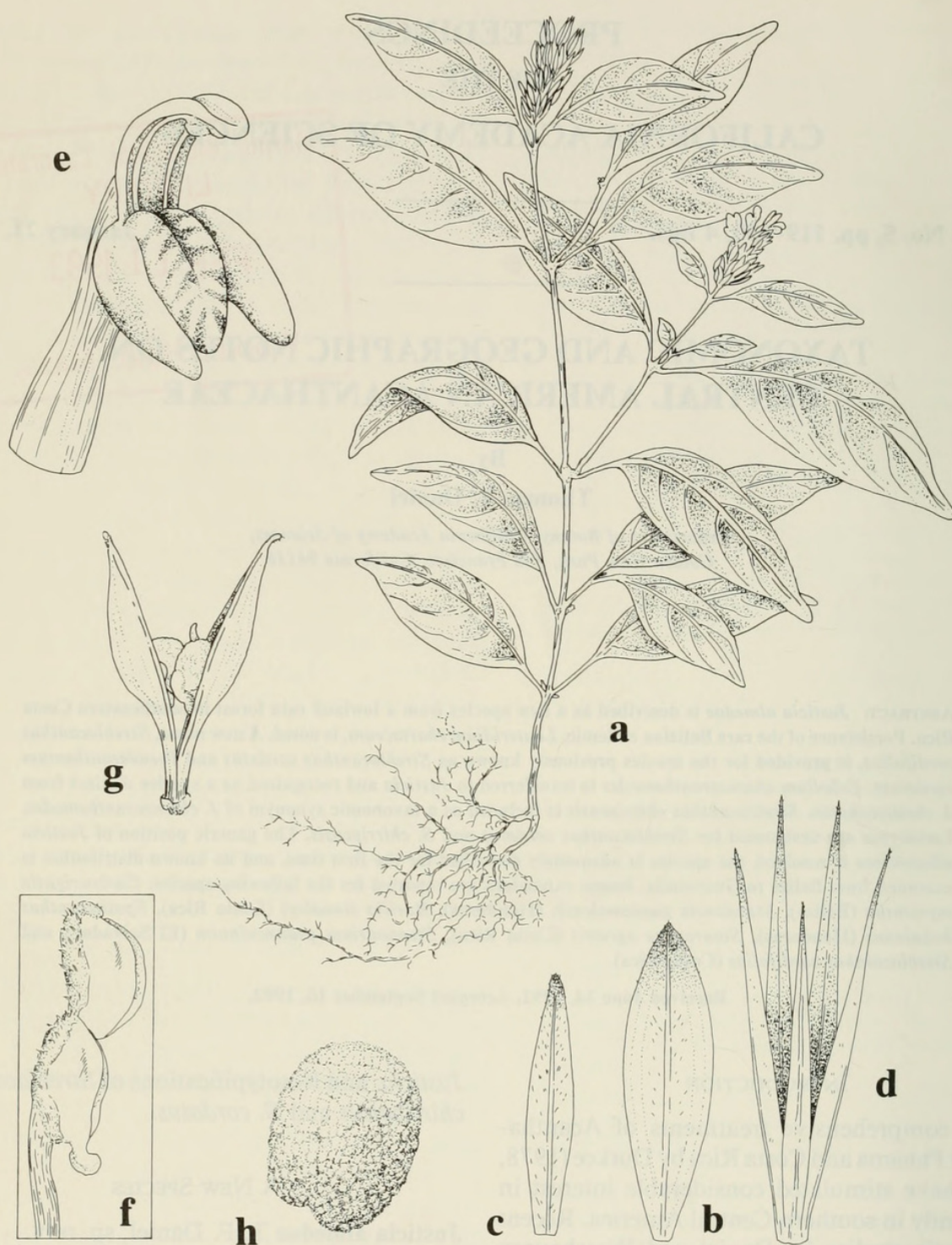


FIGURE 1. *Justicia almedae* (Daniel *et al.* 6228). (a) Habit,  $\times 0.5$ ; (b) Bract,  $\times 4.5$ ; (c) Bractlet,  $\times 4.5$ ; (d) Calyx,  $\times 6$ ; (e) Corolla,  $\times 3.75$ ; (f) Distal portion of stamen,  $\times 17.5$ ; (g) Capsule,  $\times 3$ ; (h) Seed,  $\times 8$ . Drawn by Tina Cash.

longa thecis superpositis, theca inferior calcarata. Capsula stipitata, 11.5–12 mm longa, puberula; semina 4, papillosa.

Herb to 3.5 dm tall; young stems quadrate, pubescent with antrorse to antrorse-appressed eglandular trichomes 0.1–0.2 mm long, the trichomes  $\pm$  evenly disposed. Leaves petiolate; petioles up to 22 mm long; blades ovate to ovate-elliptic, 43–134 mm long, 20–68 mm wide, 1.7–

3.6 times longer than wide, acuminate at apex, acute to attenuate at base, adaxial surface glabrous, abaxial surface pubescent along major veins with cauline type trichomes. Inflorescence of axillary (from distalmost leaf axils) or terminal, pedunculate spikes; peduncles to 6 mm long; spikes to 45 mm long; rachis  $\pm$  evenly pubescent with straight to antrorse eglandular trichomes



0.05–0.2 mm long; bracts lance-linear to narrowly elliptic, 7–9 mm long, 1.7–3 mm wide, abaxial surface inconspicuously sparsely pubescent with antrorse eglandular trichomes up to 0.05 mm long; bractlets lance-linear, 5–7 mm long, 1–1.3 mm wide, pubescent like bracts. Flowers opposite at spike nodes, sessile or borne on short (less than 1 mm long) pedicels; calyx 10–12 mm long, externally pubescent like bracts, lobes 5, lance-subulate, unequal, posterior lobe 5–7.5 mm long, 0.6 mm wide, conspicuously smaller than other lobes, the other lobes subequal, 7.5–11.5 mm long, 1–1.4 mm wide; corolla cream-white with maroon bands on lower lip, 14.5–15 mm long, externally pubescent with straight to flexuose to retrorse eglandular trichomes 0.1–0.2 mm long, limb internally pubescent with glandular trichomes 0.05–0.1 mm long, tube 8–8.5 mm long, upper lip 6.5–7 mm long, entire at apex, internally rugulate, lower lip 7–7.5 mm long with lobes subelliptic, 2.3–2.8 mm long, 1.5–3.5 mm wide; stamens 9.5 mm long, filaments glabrous, thecae superposed,  $\pm$  parallel, 1–1.2 mm long, lower theca with a spur to 0.3 mm long, pollen 2-colporate, colpi flanked by unbroken bands of exine and faint pseudocolpi; style 13 mm long, pubescent with antrorse eglandular trichomes, stigma equally bilobed with lobes 0.2 mm long. Capsule 11.5–12 mm long, stipe 4–4.5 mm long, head 7–8 mm long, inconspicuously and sparsely puberulent with antrorse eglandular trichomes 0.05 mm long; seeds 4, green turning brown, subcircular, 3–3.2 mm long, 2.5 mm wide, surface roughened with low rounded papillae.

**PHENOLOGY.**—Flowering and fruiting: February–March.

**DISTRIBUTION AND HABITAT.**—Known only from southeastern Costa Rica where plants occur in lowland rain forest (with *Hura*, *Ceiba*, *Pentaclethra*, and *Terminalia* in the overstory and *Socratea*, *Zamia*, and *Dieffenbachia* common in the understory) at an elevation of about 200 meters.

The lowland rain forests of Costa Rica's Caribbean slope are especially rich in species of Acanthaceae and continue to yield new species. Two were recently described from the Reserva Biológica Hitoy Cerere: *Herpetacanthus stenophyllus* Gómez-Laurito & Grayum and *Justicia bitarkarae* Gómez-Laurito.

*Justicia almedae* cannot be readily affiliated with any of the infrageneric taxa recognized by Graham (1988). Its pollen (Fig. 2) is most similar

to Graham's type 4. The only New World section of *Justicia*, as treated by Graham (1988), with type 4 pollen is sect. *Leucoloma*. *Justicia almedae* differs from this section by its spikes with 2-flowered nodes, bracts without a scarious margin, larger thecal appendages, and glabrous seeds.

*Justicia almedae* differs from a similar species recently described from Cerro Bitarkara, also in the Reserva Biológica Hitoy Cerere, by the following couplet:

Petioles 4–8 cm long; flowers solitary and alternate at inflorescence nodes; bracts dimorphic at a node (fertile bract considerably larger than sterile bract), petiolate, ovate to elliptic to obovate to oblanceolate, and glandular pubescent; calyx lobes equal, 5.5–6 mm long; corolla 10–11 mm long; style 6–7 mm long, glabrous; seeds (based on protologue) verrucose with waxy-yellow projections .....

..... *J. bitarkarae*

Petioles up to 22 mm long; flowers opposite at inflorescence nodes; bracts homomorphic at a node, sessile, lance-linear to narrowly elliptic, and pubescent with eglandular trichomes; calyx lobes unequal, 7.5–11.5 mm long; corolla 14.5–15 mm long; style 13 mm long, pubescent; seeds roughened with low, rounded papillae, lacking waxy-yellow projections .....

..... *J. almedae*

Pollen of these two species (Fig. 2) resembles one another except that of *J. bitarkarae* is considerably smaller and has the bands in the trema region at least partially broken up into insulae.

#### A RARE SPECIES

***Louteridium chartaceum*** Leonard, Publ. Carnegie Inst. Wash. 461:197. 1936. TYPE.—BELIZE. Belize: Gracie Rock, Sibun River, 24 March 1935, P. Gentle 1526 (holotype: US!; isotypes A, ARIZ!, K!, LL!, MICH, NY).

Multi-trunked, soft-wooded tree to 3 m tall; young stems subterete, glabrous. Leaves petiolate (or distal leaves sessile); petioles to 65 mm long, glabrous; blades ovate to ovate-elliptic, 70–285 mm long, 33–95 mm wide, 1.9–3.4 times longer than wide, rounded to acute (distal leaves) to attenuate (proximal leaves) at base, acuminate to subfalcate at apex, margin entire, surfaces glabrous. Inflorescence a terminal panicle to 400 mm long; rachis glabrous; lateral branches consisting of many-flowered short



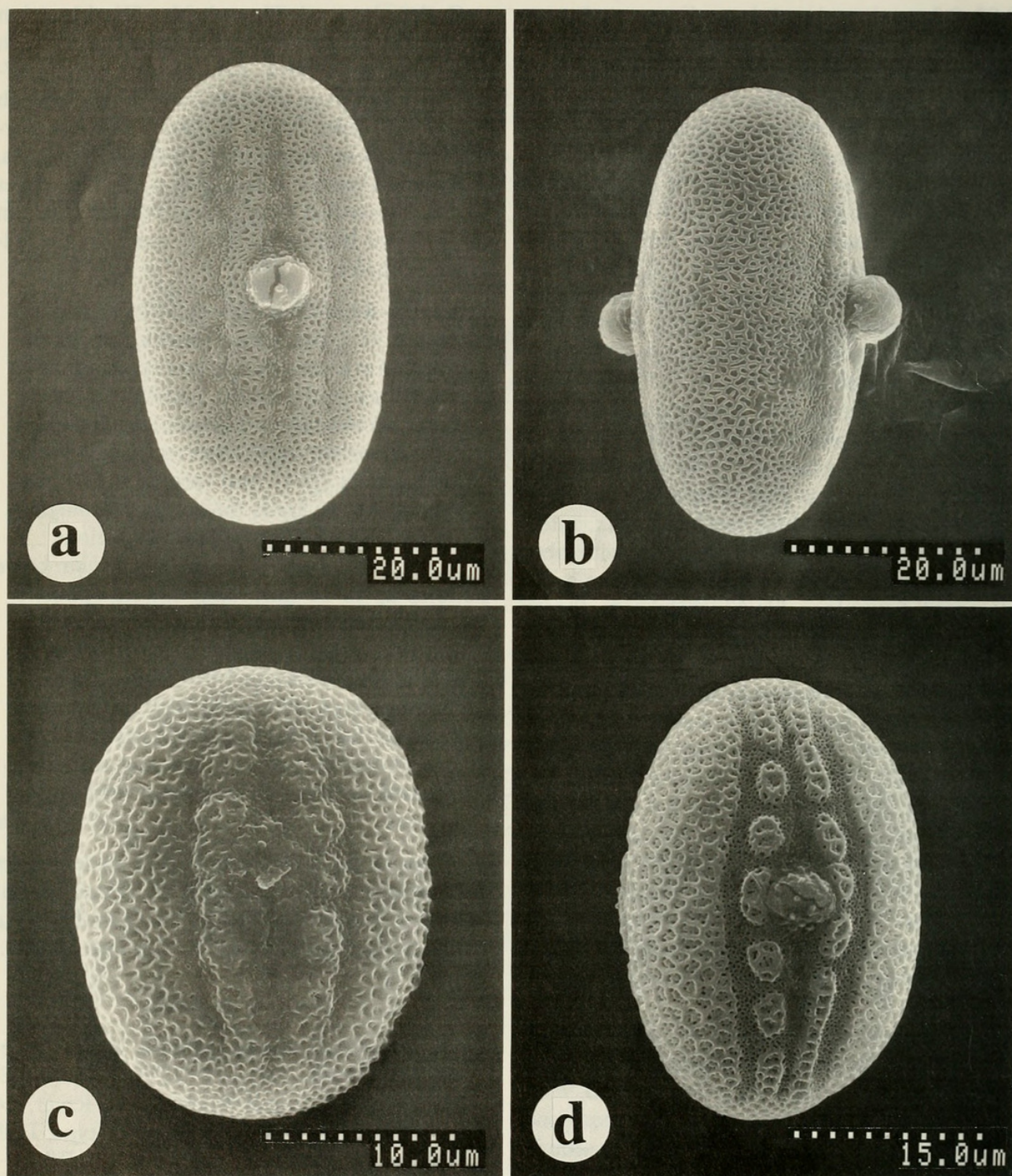


FIGURE 2. Scanning electron micrographs of pollen. (a) *Justicia almedae* (Daniel *et al.* 6228), colpal view; (b) *J. almedae* (Daniel *et al.* 6228), intercolpal view; (c) *Justicia bitakarnae* (Herrera & Soltis 2469), colpal view; (d) *Justicia albobracteata* (Proctor 36627), colpal view.

shoots to 17 mm long; bracts subtending short shoots caducous, not seen; floral bracts caducous, triangular, 2.5–3.5 mm long, 1.5–2.5 mm wide, glabrous; bractlets, if present, not evident. Flowers pedicellate; pedicels 32–43 mm long, glabrous; calyx 3-lobed, 18–25(–30) mm long, lobes subequal, linear, divided nearly to base, 3.5–5

mm wide, glabrous, posterior lobe conduplicate, anterior lobes planar; corolla green with maroon at distal tips of lobes, 35–40 mm long, glabrous, tube (to base of stamens) 5–8 mm long, throat (from base of stamens to corolla lobes) 14–17 mm long, lobes subequal, 14–14.5 mm long, 9.5–10.5 mm wide, bifid with rounded segments 2–



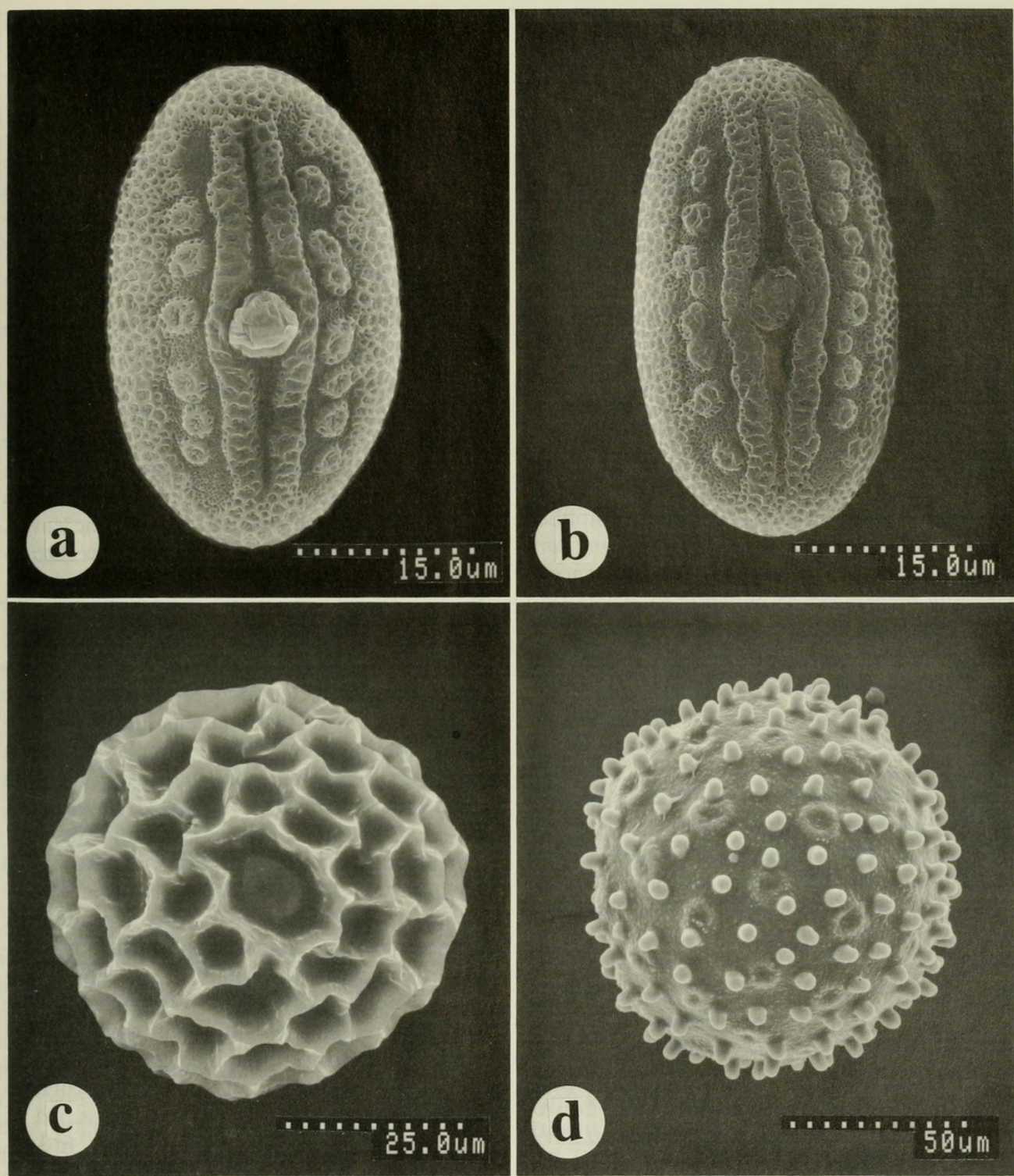


FIGURE 3. Scanning electron micrographs of pollen. (a) *Justicia chamaephyton* (Allen 5480), colpal view; (b) *Justicia chaeranthemodes* (Daniel & Almeda 6352), colpal view; (c) *Ruellia standleyi* (Almeda et al. 6858); (d) *Louteridium chartaceum* (Daniel & Butterwick 5905).

3.5 mm long, 3.5–4 mm wide; fertile stamens 4, subdidynamous, joined in pairs for 3–4 mm at base, 55–60 mm long, filaments distally glabrous, thecae 6.5–9.5 mm long, pollen (Fig. 3) spheric, pantoporate, evenly gemmate, staminode pos-

terior, consisting of a subconical projection to 1.5 mm long; style 60 mm long, glabrous, stigma to 1.5 mm long with unequal lobes. Capsule ellipsoid, 23–26 mm long, 5–7 mm across non-splitting face, glabrous, retinacula 2–2.5 mm long; seeds 16 per capsule, whitish, 4.2–4.5 mm long,



3.5–4 mm wide, thickened around periphery, margin fringed with dense, trichome-like projections, surface with low rounded protrusions.

**PHENOLOGY.**—Flowering January–March; fruiting February–March, June.

**DISTRIBUTION AND HABITAT.**—Known only from the type locality in east-central Belize where plants occur in tropical, moist forest on an isolated limestone hill in the coastal plain at elevations from 100 to 120 meters.

**ADDITIONAL SPECIMENS EXAMINED.**—BELIZE. **Belize:** Gracie Rock Hill near Rockville Quarry between Western Hwy. and Sibun River, ca. 30 km (air) SW of Belize City, *T. Daniel* & *M. Butterwick* 5905 (C, CAS, K, MICH, MO, NY), cultivated plants propagated from this collection, *T. Daniel* s.n. (CAS); Gracie Rock, 1.5–4 mi. S of Mile 22 on Western Hwy., *J. Dwyer* 10959 (LL), *R. Liesner* & *J. Dwyer* 1485 (BM, DUKE, TEX).

The above description substantially amplifies that of Leonard's protologue. *Louteridium chartaceum* is one of only four species of Acanthaceae currently recognized as endemic to Belize (the other three are *Justicia bartlettii* (Leonard) D. Gibson, *Odontonema amicorum* V. Baum, and *Ruellia obtusata* Blake). It is known from a single locality. Until recently, it was known only from the type collection made in 1935. The species is still extant at the type locality (as of February 1989), but its habitat is threatened with destruction by quarrying activities there.

Richardson (1972) included this species in section *Tetrandrium*, which is characterized by four diadelphous stamens. It differs from the other three species of this section, all restricted to west-central Mexico, by its linear (vs. lanceolate to ovate to triangular) calyx lobes that vary from 3.8 to 6 (vs. less than 3) times longer than wide and its glabrous (vs. pubescent) capsule. *Louteridium donnell-smithii* S. Wats., the only other species of the genus known to occur in Belize, differs conspicuously by its two fertile stamens and densely pubescent shoots.

#### MISCELLANEOUS TAXONOMIC NOTES

##### *Streblacanthus cordifolius* T. Daniel, nom. nov.

*Eranthemum cordatum* Nees in Benth. Bot. Voy. *H.M.S. Sulphur* 147. 1846. —See discussion for locality, *A. Sinclair* (holotype: K!). *Pseuderanthemum cordatum* (Nees) Radlk. Sitzungber. Math.-Phys. Kl. Bayer. Akad. Wiss., München 13:286. 1883.

*Streblacanthus cordatus* Lindau, Fedde Rep. Sp. Nov. 11:123. 1912. TYPE.—PANAMA. **Colón:** "forests around Porto Bello," 5–200 m, 6–8 April 1911, *W. Maxon* 5793 (lectotype: US!, see discussion).

This species was first described by Nees based on a collection made by Sinclair at Atacames, Ecuador during the voyage of *HMS Sulphur*. (The species has subsequently been collected in Ecuador, e.g., *Eggers* 14862 at K, M, and PR.) Although Nees (1846) noted that staminodes were lacking, he placed the species in *Eranthemum*, a genus that he characterized as having two staminodes (Nees 1847). Lindau (1912) correctly treated a collection of Maxon from Panama, which agrees in all characteristics with *E. cordatum*, in *Streblacanthus*. Because transfer of the earliest known epithet of this species to *Streblacanthus* would result in a later homonym, a new name has to be designated for the species according to Article 54.1 of the *International Code of Botanical Nomenclature* (Greuter et al. 1988). I have chosen one that, like the original, attempts to highlight a very distinctive feature of the leaves.

The long, slender corolla tubes of *Streblacanthus* superficially resemble those of *Pseuderanthemum* Radlk. Indeed, *S. cordifolia* has usually been treated under the latter genus (Leonard 1953; Durkee 1978). Two characters readily distinguish these genera. Species of *Streblacanthus* have an androecium of two stamens and no staminodes, and capsules with subcircular heads. In contrast, species of *Pseuderanthemum* have an androecium of two stamens and two staminodes, and capsules with hourglass-shaped heads.

In the protologue of *S. cordatus*, Lindau (1912) provided two syntypes. These consisted of collections of H. Pittier and W. Maxon made near Portobelo in 1911 as part of a Smithsonian Biological Survey of the Panama Canal Zone. Lindau did not indicate where the collections he utilized were deposited. If specimens were sent to him at B and were retained there, they were destroyed in 1943. Fortunately, specimens of both collections are extant at US and identified as "*Streblacanthus cordatus* Lindau n. sp." in Lindau's handwriting. Maxon's collection is here selected as the lectotype of *S. cordatus*. It is the more complete of the two collections, containing both flowers and fruits.

##### *Justicia chamaeranthemodes* (Kuntze) T. F. Daniel, comb. nov.

*Ecbolium chamaeranthemodes* Kuntze, Rev. Gen. Pl. 2:487. 1891. TYPE.—COSTA RICA. **Limón:** "Port Lemon" (Limón), 14 June 1874, *O. Kuntze* 1977 (lectotype, designated by Leonard, 1938: NY!).

*Streblacanthus chirripensis* Lindau, Bull. Herb. Boissier, ser. 2 4:404. 1904. TYPE.—COSTA RICA. **Cartago:** prope Haci-



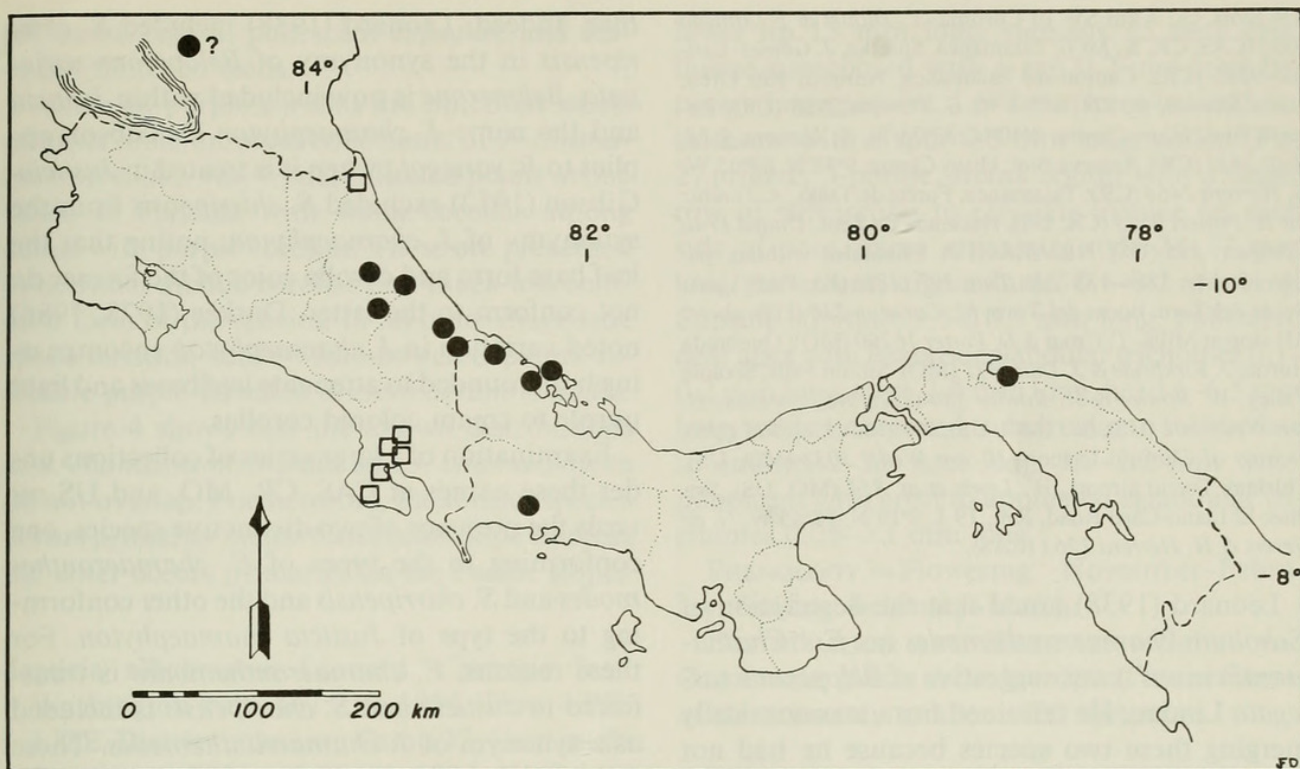


FIGURE 4. Map of southern Central America showing the distributions of *Justicia chamaeranthemodes* (closed circles) and *J. chamaephyton* (open squares). The precise Nicaraguan locality of *J. chamaeranthemodes* is not known.

enda de Chirripó [ca. 9°48'N, 83°23'W, "cerca de quebrada Platanilla en un sitio conocido como Grano de Oro" fide L. Poveda, pers. comm.], 200 m, February 1900, *H. Pittier* 16046 (holotype: B, destroyed, photos at GH and US; lectotype, designated here, see discussion: US!; isolectotype: CR!).

Perennial herb to 3 dm tall; young stems subquadrate to quadrate, pubescent with retrorse to retrorse-appressed eglandular trichomes to 0.2 mm long. Leaves petiolate; petioles to 20 mm long; blades ovate to elliptic to obovate, 38–157 mm long, 16–73 mm wide, 1.4–2.8 times longer than wide, rounded to acute (to subattenuate) at base, rounded to acute at apex, dark purplish abaxially. Inflorescence a terminal, pedunculate spike (sometimes branched proximally) to 160 mm long (including peduncles and excluding flowers); peduncles to 85 mm long, pubescent with straight to retrorse eglandular trichomes 0.05–0.2 mm long; rachis pubescent like peduncles; internodes near midspike 6–11 mm long; bracts lanceolate to subulate (to subtriangular), 2–4 mm long, 1–1.2 mm wide; bractlets lanceolate to subtriangular, 1.5–3 mm long, 0.4–0.6 mm wide. Flowers opposite at nodes, usually not overlapping; calyx 5–8 mm long, lobes heteromorphic, anterior pair 4.8–7.5 mm long, lateral

pair 3.8–5 mm long, posterior lobe 2.8–4 mm long, the differences in length among the types  $\geq 1$  mm; corolla purple, 10–13 mm long, externally pubescent with eglandular trichomes to 0.2 mm long; stamens 6–6.5 mm long, filaments glandular puberulent, thecae superposed, overlapping by 0.2 mm, upper theca 0.8–1 mm long, dorsally pubescent, lower theca 1.3–1.5 (including a basal spur to 0.5 mm long), pollen prolate, 2-colporate, colpi flanked by 1 unbroken band and 1 row of insulae; style 12.5 mm long, proximally pubescent, stigma lobes 0.2 mm long. Capsules 9.5–12.5 mm long, pubescent with straight to flexuose eglandular trichomes 0.1–0.2 mm long, stipe 4–6 mm long, head 5.5–6 mm long; seeds 4, suboval to subcordate, 2.5–3.2 mm long, 2.2–2.5 mm wide, surface smooth.

**PHENOLOGY.** — Flowering: February–December; fruiting: September–June.

**DISTRIBUTION AND HABITAT.** — Nicaragua, Costa Rica, and Panama (Fig. 4); plants occur in lowland rain forests at elevations from near sea level to 500 meters.

**ADDITIONAL SPECIMENS EXAMINED.** — COSTA RICA. Limón: between Siquerres and Río Pacuare, 10°5'N, 83°29'W, *W. Burger* & *R. Liesner* 6994 (CR, US); Port Limón, Zent banana farm, *O. Cook* & *C. Doyle* 470 (US); Cerro Skopte just W of



Río Siori, ca. 7 km SW of Coroma, *T. Daniel & F. Almeda* 6352 (CAS, CR, K, MO); Talamanca, Suretka, *J. Gómez-Laurito* 9535 (CR); Cantón de Talamanca, Amubri, Río Urén, Loma Sheuab, 9°32'N, 82°54'W, *G. Herrera* 2988 (CR); Reserva Biol. Hitoy Cerere, 9°40'N, 83°03'W, *G. Herrera & M. Solís* 2431 (CR); Reserva Biol. Hitoy Cerere, 9°38'N, 83°05'W, *G. Herrera* 2464 (CR); Talamanca, Forêts de Tsáki, *A. Tonduz* (or *H. Pittier*) 9553 (CR, US); Hacienda de Zent, *United Fruit Company* 255 (US). NICARAGUA. **Chontales:** without specific locality, 1886-1887, *R. Tate* 297 (186) (K). PANAMA. **Bocas del Toro:** Bocas del Toro, *M. Carleton* 210 (US); above RR stop at Milla, *T. Croat & D. Porter* 16290 (MO); Quebrada Huron, *J. Kirkbride & J. Duke* 427 (MO); Sibubi Falls, Sixaola Valley, *W. Rowlee & H. Rowlee* 380 (US); Water Valley, *H. von Wedel* 602 (US), 603 (MO, US), 916 (MO, US), 917 (US); vicinity of Chiriquí Lagoon, *H. von Wedel* 1038 (MO, US). **Chiriquí:** David airport, *W. Lewis et al.* 851 (MO, US). San Blas: El Llano-Cartí Road, Km. 19.1, 9°19'N, 78°55'W, *G. de Nevers & H. Herrera* 7263 (CAS).

Leonard (1938) noted that the description of *Ecbolium chamaeranthemodes* (as *E. "Chamaeranthemum"*) was suggestive of *Beloperone variegata* Lindau. He refrained from taxonomically merging these two species because he had not seen any of the type material of the former. *Ecbolium chamaeranthemodes* was based on syntypes from Nicaragua and Costa Rica (Kuntze 1891), but was not treated by Lindau (1900) or Durkee (1986). Leonard's (1938) indication of Kuntze's collection from Limón, Costa Rica as the type of this species effectively lectotypified *E. chamaeranthemodes*. Examination of both syntypes (i.e., *Tate* 297 (186) and *Kuntze* 1977) reveals that *E. chamaeranthemodes* differs from *B. variegata* in several important characters (see below). Species treated by Kuntze (1891) in *Ecbolium* are now placed in *Justicia* (Graham 1988).

Durkee (1986) concluded that *Streblacanthus monospermus* Kuntze, *S. macrophyllus* Lindau, and *S. longiflorus* Cufodontis represented a single species. All three were described from Costa Rican specimens. However, Durkee (1986) did not deal with *S. chirripensis*, a species also described from Costa Rica based on a collection of Pittier. The holotype of *S. chirripensis* was destroyed at B in 1943. Isotypes, annotated by Lindau as *S. chirripensis*, were located at CR and US, and the latter is chosen as the lectotype. The isotypes resemble a photograph (GH, US) of the destroyed holotype that shows a single plant and detailed drawings of the flower and pollen. The form of the corolla (short, ampliate tube), androecium (two stamens with superposed thecae, the lower theca conspicuously mucronate), and pollen (2-aperturate) all reveal this species to be congeneric with *Justicia* rather than *Streblacan-*

*thus*. Indeed, Leonard (1938) included *S. chirripensis* in the synonymy of *Beloperone variegata*. *Beloperone* is now included within *Justicia* and the name *J. chamaephyton* D. Gibson applies to *B. variegata* when it is treated in *Justicia*. Gibson (1972) excluded *S. chirripensis* from the synonymy of *J. chamaephyton*, noting that the leaf base form and corolla color of the former do not conform to the latter. Durkee (1978, 1986) noted variation in *J. chamaephyton* encompassing both rounded to attenuate leaf bases and light purple to cream colored corollas.

Examination of a large series of collections under these names at CAS, CR, MO, and US reveals the presence of two distinctive species, one conforming to the types of *E. chamaeranthemodes* and *S. chirripensis* and the other conforming to the type of *Justicia chamaephyton*. For these reasons, *E. chamaeranthemodes* is transferred to *Justicia* and *S. chirripensis* is included as a synonym of *J. chamaeranthemodes*. These two species can be distinguished by the following couplet:

- Corolla purple; calyx lobes conspicuously unequal, the anterior pair equal,  $\geq 1$  mm longer than the lateral pair, the lateral pair equal,  $\geq 1$  mm longer than the posterior lobe; trichomes of young stems, peduncle, and rachis 0.05–0.2 mm long; internode length near midspike 6–11 mm long, the bracts and flowers rarely overlapping ..... *J. chamaeranthemodes*
- Corolla cream or greenish yellow; calyx lobes subequal, the anterior pair  $< 1$  mm longer than the lateral pair, the lateral pair  $< 1$  mm longer than the posterior lobe; trichomes of young stems, peduncle, and rachis 0.2–1.5 mm long; internode length near midspike 2–3 (–8) mm long, the bracts and flowers overlapping ..... *J. chamaephyton*

Pollen of both species (Fig. 3) is 2-colporate with the trema region traversed by 2 unbroken bands and 2 rows of insulae (one of each on both sides of the colpi). This type of pollen is not included among the 10 types of pollen in *Justicia* as delimited by Graham (1988). Using Graham's (1988) key to infrageneric taxa of *Justicia*, both *J. chamaeranthemodes* and *J. chamaephyton* would be included in section *Rostellaria* subsection *Rostellaria*. The two Central American species differ from this Old World assemblage by their longer corollas, pollen with solid bands in



the trema region, pubescent capsules, and distinctly flattened seeds.

Although purple corollas are noted on labels or observable on most collections of *J. chamaeranthemodes*, von Wedel collected plants at one locale in Panama with white corollas among plants with purple corollas. These are presumed to be either albinic corollas or a much less common form of the species. In all other diagnostic characteristics, these white-flowered plants resemble purple-flowered *J. chamaeranthemodes*.

Figure 4 shows that the known distributions of *J. chamaeranthemodes* and *J. chamaephyton* do not overlap. Furthermore, the former species occurs primarily on the Caribbean slope whereas the latter occurs primarily on the Pacific slope.

***Justicia albobracteata*** Leonard, Carnegie Inst. Washington Publ. 461:230. 1936. TYPE.—BELIZE. **District unknown:** Camp 32, Guatemala Survey, ca. 700 m, 2 March 1934, *W. Schipp* 1277 (holotype: F; isotypes: CAS!, MICH!).

Shrub to 1 m tall; younger stems subquadrate, bifariously pubescent with flexuose-ascendant eglandular trichomes to 1 mm long. Leaves petiolate; petioles to 25 mm long; blades narrowly elliptic to narrowly obovate-elliptic, 45–132 mm long, 13–35 mm wide, 2.5–3.8 times longer than wide, acute to attenuate at base, acute to acuminate at apex, abaxial surface pubescent with cauline type trichomes, the trichomes becoming restricted to major veins, adaxial surface pubescent along midvein, soon glabrate. Inflorescence of axillary pedunculate spikes to 65 mm long (including peduncle but excluding flowers), 12–17 mm in diameter (measured flat) near midspike; peduncles to 32 mm long, pubescent like stems; rachises pubescent like peduncles; bracts “greenish white,” ovate to elliptic, 8.5–16 mm long, 4.5–9.5 mm wide, abaxially pubescent along midvein with appressed-flexuose eglandular trichomes, margin ciliate with similar trichomes; bractlets narrowly elliptic to narrowly ovate-elliptic, 7–10 mm long, 1.5–3.5 mm wide, pubescent like bracts or the abaxial surface glabrous. Flowers solitary, sessile at nodes; calyx 5-lobed, 4.5–5.5 mm long, lobes lance-subulate, 4–5 mm long, abaxially glabrous; corolla “pale yellow” or “white,” 29–31 mm long, externally pubescent with flexuose eglandular trichomes, tube 15–16 mm long, distally ampliate, upper lip 14 mm long, internally rugulate, apically emarginate,

lower lip 15 mm long; stamens 15 mm long, thecae superposed with a gap 0.2 mm long between them, parallel, 1.6–2 mm long, lower theca calcarate with a spur 0.5 mm long, pollen (Fig. 2) prolate, 3-porate, trema region with a single row of subcircular to elongate insulae on each side of pore, exine reticulate; style 24–27 mm long, pubescent, stigma flared, 0.1–0.2 mm long. Capsule stipitate, 9.5–10.5 mm long, pubescent near apex with flexuose eglandular trichomes 0.1–0.2 mm long, stipe 3–4 mm long, head 6–6.5 mm long; seeds 4, flattened, subcircular to subcordate in outline, 2–2.4 mm long, 1.8–2.2 mm wide, pubescent with erect to appressed eglandular trichomes 0.05–0.1 mm long.

**PHENOLOGY.**—Flowering: November–February; fruiting: February–March.

**DISTRIBUTION AND HABITATS.**—Belize and Guatemala; plants occur in tropical moist forests at elevations up to about 600 meters.

**ADDITIONAL SPECIMENS EXAMINED.**—BELIZE. **Toledo:** Columbia Forest Reserve, vicinity of Union Camp, 575–600 m, *G. Proctor* 36627 (F). GUATEMALA. **Petén:** Los Arcos, Cadenas Road, W of KM 143/144, *E. Contreras* 9356 (US); La Cumbre, on Chocalte arriba, KM 155, *E. Contreras* 10554 (US), 10558 (US), 10565 (US).

The above cited collections from Guatemala are the first records of *J. albobracteata* from that country. Gibson (1974) stated that material of this species, then known only from a fruiting collection from Belize, was insufficient to allow for its description or interpretation. Thus she did not include the species in her treatment (Gibson 1974) of Acanthaceae for the *Flora of Guatemala*, the coverage of which also included Belize. The species was not listed among the Acanthaceae of Belize by Dwyer and Spellman (1981). Recent flowering and fruiting collections of *J. albobracteata* from Belize and Guatemala permit a complete description of the species and an assessment of its affinities.

Floral characters (especially the internally rugulate upper lip, the calcarate lower thecae, and the pollen), place this species into *Justicia*. It does not conform to any of the infrageneric taxa treated by Graham (1988), however. Its pollen (Graham’s type 2) resembles that of the Old World section *Tyloglossa*. Numerous macromorphological features of *J. albobracteata* (e.g., shrubby habit, simple inflorescences, larger corollas, and flattened seeds) preclude its placement in that section, however.



## RANGE EXTENSIONS

**Carlowrightia myriantha** (Standley) Standley

BELIZE. **Corozal:** Cerros Maya Ruins, Lowry's Bight, ca. 2 mi S of Cerros, 8 April 1983, *C. Crane* 516 (LL).

Twenty-three species of *Carlowrightia*, all of which occur in Mexico, are presently recognized (Daniel 1988). *Carlowrightia myriantha* was known previously from the Yucatán Peninsula of Mexico (Quintana Roo and Yucatán) (Daniel 1988). Crane's flowering and fruiting collection from northern Belize is the first record of this species outside of Mexico. It is the only species of *Carlowrightia* known from Belize and one of only three species of the genus known to occur in Central America (Daniel 1983, 1988). The three species of *Carlowrightia* in Central America can be distinguished by the following key:

1. Cauline trichomes antrorse; corolla externally glabrous; capsule sparsely pubescent at apex of head, otherwise glabrous; seeds 2–3 mm long, the margin entire; Belize ..... *C. myriantha* (Standley) Standley
1. Cauline trichomes straight to flexuose to retrorse; corolla externally pubescent (at least on lower-central lobe); capsule entirely glabrous or pubescent throughout head; seeds 3.5–4.8 mm long, the margin denticulate or irregularly fringed.
  2. Young stems pubescent with glandular and eglandular trichomes; corolla 17–18.5 mm long; capsule pubescent throughout head; seeds with a prominent, swollen marginal ring, the margin fringed with irregular, wing-like projections; El Salvador ... *C. hintonii* T. Daniel
  2. Young stems pubescent with eglandular trichomes only; corolla 9–15 mm long; capsule entirely glabrous; seeds lacking a swollen marginal ring, the margin denticulate; Guatemala and Costa Rica ..... *C. arizonica* A. Gray

**Mendoncia guatemalensis** Standley & Steyermark

HONDURAS. **Cortes:** entre Agua Azul y Pito Solo, Lago de Yojoa, 600 m, 28 May 1956, *A. Molina R.* 7329 (LL).

The range of this species was recently extended northwestward from Guatemala to Mexico (Daniel 1992). This collection extends it south-eastward into the "bosque lluvioso" of western Honduras. Two other species of *Mendoncia* have

been reported from Honduras, *M. retusa* Turrill and *M. costaricana* Oersted (Molina 1975). Ten species of *Mendoncia* are presently recognized as occurring in Central America (Durkee 1978, Gibson 1974). *Mendoncia guatemalensis* is similar in many characteristics to *M. gracilis*, which is known from Colombia, Panama, and Costa Rica. The primary differences between them, based on published descriptions and specimens available to me, appear to be the shorter bracteoles (15–19 mm long vs. 20–29 mm long) and corollas (25–30 mm long vs. 40–42 mm long) of the latter species. Molina's specimen from Honduras lacks corollas but has bracteoles 25 mm long. The relationship between these two species deserves further study.

**Ruellia standleyi** Leonard

COSTA RICA. **Cartago:** Refugio Nacional de Fauna Silvestre Tapantí, Sendero Oropendola and vicinity, 1250–1300 m, 22 March 1986, *F. Almeda, B. Anderson, & N. Zamora* 5697 (CAS, CR, TEX), 1 March 1991, *F. Almeda, T. Daniel, & B. Bartholomew* 6858 (CAS, CR, DUKE, MO), 13 February 1992, *T. Daniel & F. Almeda* 6336 (CAS, CR, K, MICH); pasture and forested slope N of Quebrada Casa Blanca, Tapantí, 9°47'N, 83°48'W, 1350 m, 25 November 1984, *M. Grayum* 4591 (CAS).

This species was previously known only from Guatemala (Gibson 1974) and Nicaragua (Durkee 1988). The Costa Rican specimens listed above were collected in a region of montane rain forest to cloud forest on the Caribbean escarpment where they were locally common.

*Ruellia standleyi* is a viscid herb to 1 m tall with greenish yellow to greenish white corollas (15–20 mm long) and stipitate-ellipsoid capsules. Gibson (1974) provided a detailed description of the species and Leonard (1941) included an illustration of it in the protologue. Pollen of this species (Fig. 3) is similar to that described for all other Mesoamerican *Ruellia*.

**Spathacanthus hahnianus** Baillon

HONDURAS. **Yoro:** ca. 16 km from Yaryuha on Quebrada de Oro to Cerro Bufalo, 900–950 m, 15 August 1982, *W. Holmes* 4392 (TEX).

Three species are recognized in this neotropical genus of tall shrubs. *Spathacanthus hahnianus* (including *S. simplicifolius* (J. Donnell Smith) Leonard) was previously known from Guatemala (Gibson 1974) and southern Mexico (Daniel 1986). This collection extends its range into northwestern Honduras. The distinctions



among the three species of *Spathacanthus* and their distributions are provided in the following key:

1. Calyx at anthesis equally or subequally divided into 2 prominent segments; corolla 73–95 mm long; capsule 55–85 mm long; Costa Rica ..... *S. hoffmannii* Lindau
1. Calyx at anthesis unequally divided into 2 (rarely more) prominent segments; corolla 23–70 mm long; capsule 40–62 mm long.
  2. Corolla 23–29 mm long, the throat 5–7.5 mm in diameter, the limb 5–8 mm in diameter with lobes 1–3 mm long; capsule 40–43 mm long; Mexico and Guatemala ..... *S. parviflorus* Leonard
  2. Corolla 50–70 mm long, the throat 9.5–15 mm in diameter, the limb 25–40 mm in diameter with lobes 9–15 mm long; capsule 55–62 mm long; Mexico, Guatemala, Honduras ... *S. hahnianus* Baillon

### *Staurogyne agrestis* Leonard

COSTA RICA. **Guanacaste:** Exsiccated bog, near Finca Escomeka, ca. 10 km S of Las Cañas, 10 March 1965, *R. Godfrey* 66973 (CR).

This is the initial report of this genus in Costa Rica. The rarely collected species, *S. agrestis*, was described based on collections from Nicaragua and Panama. Daniel and Lott (in prep.) also report *S. agrestis* from Mexico and Venezuela.

*Staurogyne* consists of about 80 species distributed worldwide in tropical regions. Most of the American species occur in Brazil. Taxonomically, the genus is usually included in subfamily Nelsonioideae (Lindau 1895), which consists of capsular-fruited herbs with retacula papilliform or lacking. The other Costa Rican genera of this subfamily are *Nelsonia* R. Br. and *Elytraria* Michx. *Staurogyne* differs from these genera by the following combination of character states: leaves opposite, anterior lobe of calyx divided nearly to base into two similar segments, stamens four, and stigma divided into two lobes.

### *Stenandrium pedunculatum* (J. Donnell Smith) Leonard

EL SALVADOR. **Santa Ana:** an der Strasse zwischen dem Lago de Guija und Metapán, 300 m, 7.5.1958, *F. Weberling* & *F. Schwanitz* 2273 (M).

This collection documents *Stenandrium pedunculatum* in El Salvador for the first time. The species was previously known from western and

southern Mexico, Guatemala, Honduras, and Nicaragua (Daniel 1984). The three species of *Stenandrium* known from Central America can be distinguished by the following key:

1. Plants acaulescent; bracts subulate to lanceolate to elliptic.
  2. Leaf blades truncate to cordate at base, not decurrent on petiole; bracts subulate,  $\leq 1.8$  mm wide ..... *S. subcordatum* Standley
  2. Leaf blade acute to attenuate at base, often decurrent on petiole; bracts lanceolate to elliptic,  $\geq 2$  mm wide ..... *S. dulce* (Cav.) Nees
1. Plants caulescent; bracts obovate ..... *S. pedunculatum* (J. Donnell Smith) Leonard

### *Streblacanthus cordifolius* T. Daniel

COSTA RICA. **Puntarenas:** hills above Palmar Norte, trail to Buenos Aires, 17 February 1951, *P. Allen* 5903 (F).

*Streblacanthus* Kuntze comprises fewer than five species of perennial herbs in Central and South America. Durkee (1986) recognized a single species of the genus, *S. monospermus*, as occurring in Costa Rica (see above). Allen's collection from southern Puntarenas adds *S. cordifolius* (see above for synonyms) to the known flora of the country. These two species can be distinguished by the following couplet:

- Young stems evenly pubescent with trichomes up to 0.1 mm long; leaf base subcordate to cordate; rachis and bracts inconspicuously glandular, if at all; bracts and bractlets shorter than calyx; calyx 5-lobed, 10–25 mm long; capsule 13–20 mm long ..... *S. cordifolius* T. Daniel
- Young stems pubescent in 2 lines with trichomes greater than 0.3 mm long; leaf base acute to attenuate; rachis and bracts conspicuously glandular; bracts and bractlets longer than calyx; calyx 4-lobed, 4–6 mm long; capsule 20–25 mm long ..... *S. monospermus* Kuntze

*Streblacanthus cordifolius* is now known from Costa Rica, Panama, Colombia, and Ecuador.

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### RESUMEN

Se describe *Justicia almedae* como especie nueva que se encuentra en una selva lluviosa de tierra baja de la parte sudeste de Costa Rica. Se hace cuenta de que *Louteridium chartaceum*, una especie rara, persiste en Belice. Se provee un nombre nuevo, *Streblacanthus cordifolius*, para la especie anteriormente conocido como *S. cordatus* y *Pseuderanthemum cordatum*. Se transfiere *Ecbolium chamaeranthemodes* a *Justicia* como especie distinta de *J. chamaephyton*. Se incluye *S. chirripensis* como sinónima taxonómica de *J. chamaeranthemodes*. Se designa lectotipos para *S. cordatus* y *S. chirripensis*. Se reporta registros distribucionales nuevos para *Carlowrightia myriantha* (Belice), *Mendoncia guatemalensis* (Honduras), *Ruellia standleyi* (Costa Rica), *Spathacanthus hahnianus* (Honduras), *Staurogyne agrestis* (Costa Rica), *Stenandrium pedunculatum* (El Salvador), y *Streblacanthus cordifolius* (Costa Rica).

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