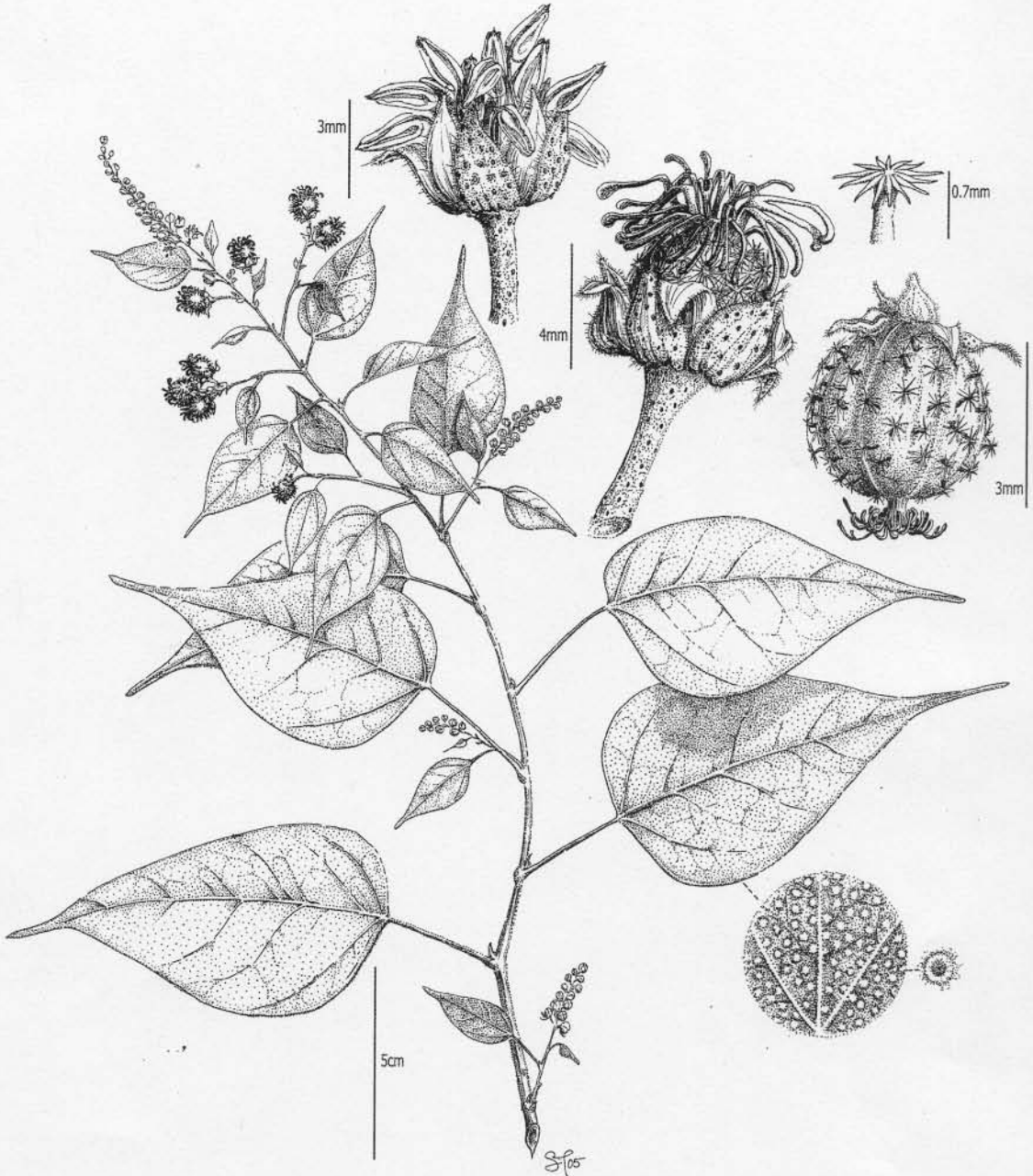


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A NEW MEXICAN SPECIES OF *CROTON* SECTION *ELUTERIA* (EUPHORBIACEAE)

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Abstract: A new species of *Croton* sect. *Eluteria* from Estado de Veracruz, Mexico, *Croton gomezii*, is described and illustrated. The species appears most closely related to *Croton arboreus* on the basis of its indumentum, but has been generally confused with *Croton reflexifolius*. A key is provided to aid in distinguishing *Croton gomezii* from related Mexican species of section *Eluteria*.

Keywords: *Croton*, *Eluteria*, Euphorbiaceae, Veracruz, Mexico.

Among the many taxa of the large genus *Croton* L., section *Eluteria* Griseb. is distinctive in its inflorescences that are axillary (or terminal on lateral shoots), petaliferous pistillate flowers, and eglandular exstipulate leaves with lepidote indumentum. In the 19th century, there were many publications on a number of species in the section that were used medicinally as "Casarilla Bark" or "Copalchi" to substitute for quinine in the treatment of malaria (Lindley, 1838; Bennett, 1859; Del Amo, 1979). In the circumscription of Webster (1993), section *Eluteria* is an entirely neotropical group of about a dozen species centered in Mesoamerica and the West Indies. There has been much confusion in the delimitation and typification of the species since the treatment of Müller (1866). Although there is no recent comprehensive systematic study

of the cascarilla bark species, a key and synopsis of the species in western Mexico is provided by Webster (2001).

In his perceptive study of *Croton* species from the Misantla area in Veracruz, Mexico, Gomex-Pompa (1966) cited a distinctive species with long-acuminate leaf tips as *C. sylvaticus* Schltld. However, the name of Schlechtendal is illegitimate because of the earlier African species *C. sylvaticus* Hochst., published in 1845. Although Govaerts et al. (2000) list *C. sylvaticus* Schltld. as a synonym of *C. reflexifolius* Kunth in H.B.K., this is incorrect, because the plant of Veracruz studied by Schlechtendal and Gomez-Pompa is a distinct species that up until now has lacked a valid name. The relationships of *C. gomezii* with the other Mexican taxa of sect. *Eluteria* are indicated by the following key. Terminology of trichomes is based on the descriptions of Webster et al. (1996).

KEY TO THE MEXICAN SPECIES OF SECT. *ELUTERIA*

1. Leaves palmately veined or triplinerved.
 2. Ovary stellate-tomentose.
 3. Stamens 13–16, filaments glabrous except at base; trichomes of ovary whitish; capsules subglobose; abaxial foliar lepidote scales often porrect *C. niveus*
 3. Stamens 10, filaments pilose; trichomes of ovary yellowish; capsules prolate; abaxial foliar lepidote scales not porrect *C. souzai*
 2. Ovary lepidote.
 4. Scales of ovary deeply divided (stellate-lepidote); capsules \pm verrucate.
 5. Leaf blades bluntly acuminate or cuspidate, mostly 5-veined and rounded to distinctly cordate at base, usually densely lepidote abaxially; capsular verrucae dense, blunt, \pm covered on the sides with lepidote scales *C. arboreus*
 5. Leaf blades caudate-acuminate, mostly 3-veined and obtuse to truncate, rounded or subcordate

- (rarely cordate) at base, sparsely lepidote to glabrescent abaxially; capsular verrucae scattered, slender and tapering distally, glabrous except for a terminal stellate-lepidote scale *C. gomezii*
4. Scales of ovary denticulate (radii mostly fused almost to tips); capsules smooth or nearly so.
 6. Inflorescences mostly 1–2 cm long, floral buds overlapping.
 7. Scales of ovary 0.3–0.6 mm in diameter; stamens 12–16; leaf blades basally cordate, densely lepidote abaxially *C. fantzianus*
 7. Scales of ovary 0.7–1 mm in diameter; stamens 9–11; leaf blades basally cuneate to truncate, glabrescent abaxially *C. pseudoniveus*
 6. Inflorescences mostly exceeding 2 cm, floral buds scarcely overlapping.
 8. Fruiting pedicels mostly 9–17 mm long (or more), 0.6–1 mm thick; seeds 4.5–6.5 mm long; inflorescences 2–6 cm long *C. reflexifolius*
 8. Fruiting pedicels 7–20 mm long, 1–1.5 mm thick; seeds 10–16 mm long; inflorescences 8–22 cm long *C. guatemalensis*
 1. Leaf blades pinnately veined.
 9. Fruiting pedicels 10–30 mm long, slender (< 1 mm thick); stamens (12-) 15–17 (-20), filaments glabrous or sparsely hirsutulous; seeds 6–8 mm long *C. schiedeanus*
 9. Fruiting pedicels 1.5–8.5 mm long, stouter (at least 1 mm thick); stamens (9) 10–12, filaments usually copiously hirsutulous; seeds 4.5–6.2 mm long *C. nitens*

Croton gomezii G. L. Webster, sp. nov.
(Fig. 1).

TYPE: MEXICO. VERACRUZ. Mpio. Tepezintla, 3 km SW of Tepezintla, 18 Mar. 1971, F. Chiang 360 (HOLOTYPE, GH!).
Croton sylvaticus Schltld., *Linnaea* 19: 240. 1846. (*nom. illeg.*, non *Croton sylvaticus* Hochst., *Flora* 28: 82. 1845). TYPE: MEXICO. VERACRUZ. in sylvis Papan-tlae, Dec. 1828, C. J. W. Schiede 1125 (HOLOTYPE, HAL 48880!; photograph, DAV).

Arbuscula monoica foliis palmatinervis caudato-acuminatis, trichomatibus lepidotis; inflorescentiis 2.5–8 cm longis; staminibus 9–12; pedicello fructificante 5–7.5 mm longo; lepidis ovarii 8–15-radiatis, stylis multifidis.

MONOECIOUS SHRUB 2–4 m high; twigs sparsely to copiously lepidote. LEAF BLADES chartaceous, ovate to ovate-lanceolate, mostly 5–9 cm long, 2–5 cm broad, cuspidate-acuminate (acumen 1–2 cm long), obtuse or rounded to truncate or subcordate (rarely cordate) at base, mostly triplinerved, adaxially sparsely lepidote, abaxially sparsely lepidote to glabrescent; petioles sparsely to copiously lepidote, 1–5 cm long; stipules 1.5 mm long or less, caducous. INFLORESCENCES terminal on main and lateral axes, 2.5–8 cm long, rachis 0.5–0.8 mm thick,

mostly bisexual with 1–3 basal pistillate flowers, sometimes staminate. STAMINATE FLOWERS 1 per bract; pedicel lepidote, 2.5–4 mm long; petals elliptic or obovate, 2.0–2.5 mm long, adaxially hirsutulous, abaxially glabrous or sparsely lepidote; stamens 9–12, filaments 2–3 mm long, basally hirsutulous; anthers 0.8–1.2 mm long. PISTILLATE FLOWERS 1 per bract, pedicel in fruit 4–5 (-9) mm long, 0.6–1 mm in diameter, copiously lepidote; sepals deltate, 2.5–3.5 mm long, villose adaxially, densely lepidote abaxially; petals elliptic, 2.5–3.2 mm long, villose adaxially, glabrous or lepidote abaxially; ovary stellate-lepidote, the scales 0.6–1.2 mm broad, deeply divided into 8–20 radii; styles 4–8-fid, 2.5–3.5 mm long, glabrous. CAPSULE 8–10 mm broad, verrucate; verrucae scattered, tapering to a point, 1–2 mm long, glabrous except for a stellate-lepidote scale at the apex; columella 8 mm long; seeds ellipsoidal, acute, smooth, 5.5–9.5 mm long; caruncle subterminal, c. 0.7–1 mm broad. (Fig. 1)

DISTRIBUTION AND ECOLOGY. Semi-evergreen and evergreen lowland rain forests, Caribbean region of eastern Mexico from southern Tamaulipas to Veracruz and Tabasco, sea level to 500 m.

PHENOLOGY. Flowering and fruiting mainly from March to May.

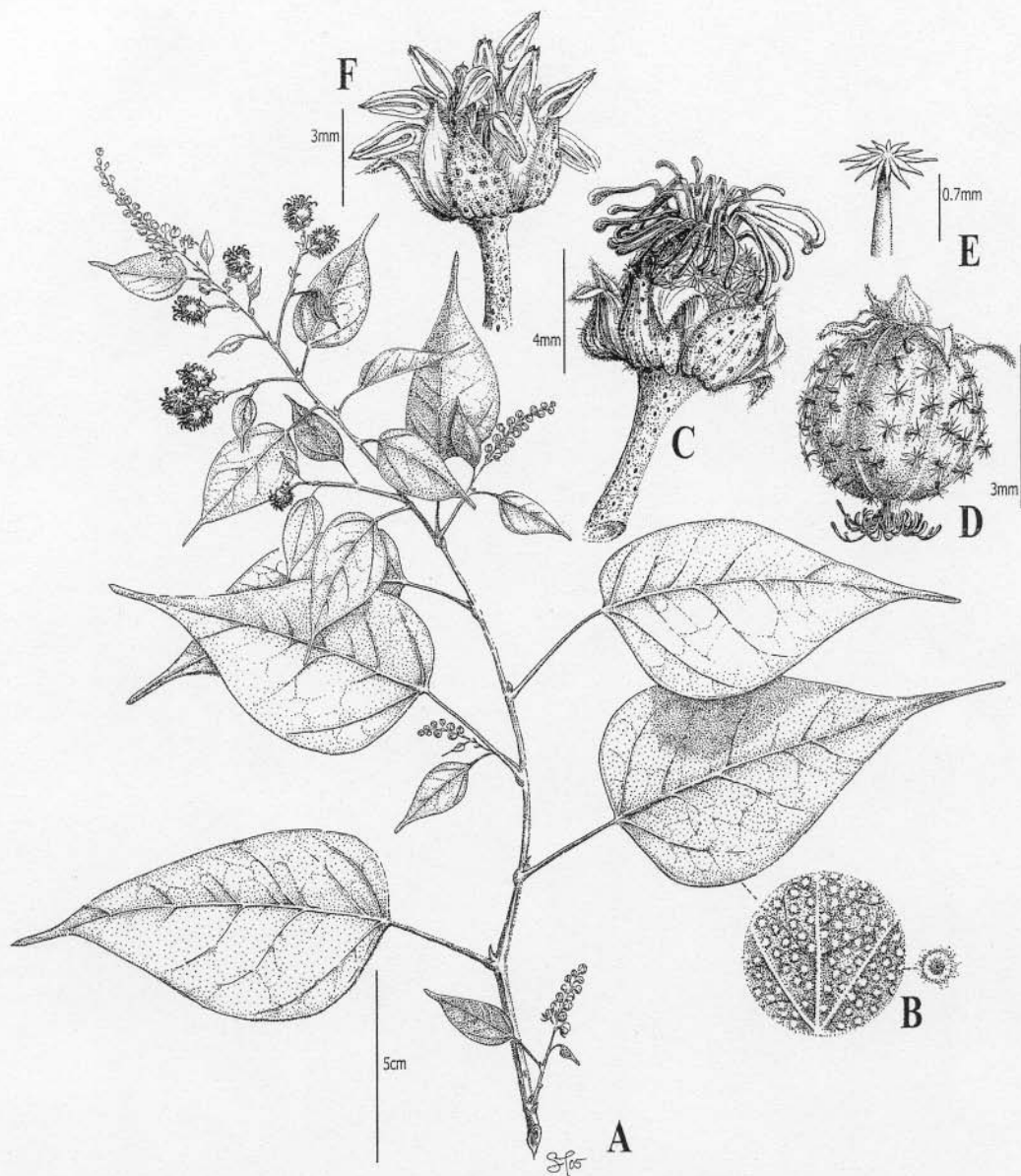


FIG. 1. *Croton gomezii*. A. Branch with leaves and inflorescences. B. Abaxial leaf surface, with one lepidote scale enlarged. C. Pistillate flower. D. Capsule with verrucae. E. Enlarged single verruca with terminal scale, from capsule. F. Staminate flower. (A from Harriman & Jansen 12332; B–E from Ventura 1247; F from Dorr 2657). Illustration by Sarah Thrasher.

VERNACULAR NAMES. Caobilla, copalchi, palo blanco (Del Amo, 1979).

ETYMOLOGY. The species epithet appropriately honors Dr. Arturo Gómez-Pompa, distinguished student of the systematics and ecology of Mexican flora and vegetation,

and author of a critical study of the taxa of sect. *Eluteria* in the Misantla area of Veracruz.

NOMENCLATURE. In his study of the species of *Croton* in the Misantla region, Gómez-Pompa (1966) cited specimens of

C. gomezii as *C. sylvaticus* Schtdl., an illegitimate name. However, he later labelled specimens from the Misantla area with an unpublished epithet based on the locality of Schiede's original collection. As pointed out by Gómez-Pompa, his Misantla *Croton* had been confused with *C. reflexifolius* H.B.K. by Schlechtendal and other authors. Because of the relatively scanty reproductive condition of the type of *C. sylvaticus* Schtdl., it has seemed preferable to describe *C. gomezii* as a new species based on an unequivocal type specimen.

RELATIONSHIPS. It seems clear that Schlechtendal and Gómez-Pompa were correct in recognizing as a distinct species the plant here named *Croton gomezii*, which is readily distinguished by its caudate-acuminate leaf blades and verrucate fruits. However, its closest relationship appears to be not with *C. reflexifolius* H.B.K., but rather with *C. arboreus* Millsp. The latter species, with deeply divided lepidae and verrucate capsules, seems much closer to *C. gomezii*. The recently described species from Veracruz, *Croton souzae* (Martínez-Gordillo & R. Cruz, 2002) differs from *C. gomezii* in its stellate-fasciculate yellowish ovarian trichomes, and appears most closely related to *C. niveus* Jacq.

ADDITIONAL SPECIMENS EXAMINED. MEXICO.

HIDALGO. Mpio. Huejutla de Reyes, Huejutla, 1842-43, *Ghiesbrecht* 37 (P). **OAXACA:** Mpio. Acatlán, Rincón del Tigre, 100 m, 19 May 1986, *Cortés et al.* 294 (DAV); Mpio. Temascal, Temascal, 27 m, 26 May 1964, *Janzen* 10487 (MO); 5 mi E of Temascal, 15 m, 27 May 1964, *Janzen s.n.* (UC 303445); Mpio. Tuxtepec, Chiltepec, 1940-41, *Martínez-Calderón* 324 (A, LL); Encinal de Tuxtepec, 20 m, 16 Mar. 1967, *Martínez-Calderón* 1334 (MO). **PUEBLA.** Mpio. Hueytamalco, Paxta, 300 m, 25 Feb. 1980, *Ventura* 16891 (CAS, MO). **SAN LUIS POTOSÍ.** Mpio. Antonio Santos, 31 mi S of Valles, 22 Mar. 1967, *Wilson* 12437 (TEX); Aquismón, 250 m, 18 Mar. 1962, *Rzedowski* 15563 (MICH, TEX); 16.4 mi SE of Aquismón, *Dorr et al.* 2657 (MO); Tacanhuitz, *Nelson* 4364 (GH), 300 m, 16 Apr. 1956, *Rzedowski* 7483 (MICH); Mpio. Tamazunchale, Clasuapa, *Edwards* 657 (MO, TEX), Tamazunchale, *Kenoyer s.n.*, 3 mi N of Tamazunchale, 7 Apr. 1976, *Harriman & Jansen* 12288 (DAV); 5 mi N of Tamazunchale, 120 m, 25 Mar. 1964, *Ahs-*

hapanek 302 (TEX); Palitla, 13 July 1943, *Lundell* 12228 (LL, MICH); Taman, 15 km SW of Tamazunchale, 14 Apr. 1944, *Hernández X. 160* (LUND); Mpio. Terrazas, Arroyo Seco, 10 km NE of Picholco, *Hernández & Tenorio* 7008 (CAS); Mpio. Xilitla, 1 mi N of Xilitla, 8 Apr. 1976, *Harriman & Jansen* 12332 (DAV), 7-12 mi NE of Xilitla; 27 Mar. 1961, *King* 4317 (MICH, TEX, UC), 29 Mar. 1961, 4363 (MICH, UC); Mpio. Valles, S of El Pujal, 14 July 1943, *Lundell* 12246 (LL, MICH). **TABASCO.** Mpio. Tenosique, Ejido La Palma, 100 m, 11 Mar. 1976, *Calzada & Arrellana* 2213 (DAV). **TAMAULIPAS.** Horcaditas a Tampico [locality uncertain], *Berlandier* 2164 (GH). **VERACRUZ.** Mpio. Actopan, inter Lagune Verde et Actopan, Dec. 1828, Mar. 1829, *Schiede* (HAL 48440, 48441, 48879); Mpio. Alto Lucero, Cerro Metates, 300 m, 27 May 1977, *Calzada* 3210 (DAV); Mpio. Atoyac, *Matuda* S-10 (MICH); Mpio. Atzalan, San Javier, 100 m, 6 June 1970, *Ventura* 1247 (LL, MICH, MO, TEX); Mpio. Coxquihui, Cerro Acsmaxni, 170-270 m, 10 Apr. 1985, *Tenorio et al.* 8553, 8563 (TEX); Mpio. Medellín, 15 Aug. 1866, *Hahn s.n.* (P); Montepio, Río Máquina, 1 m, 20 Mar. 1966, *Cruz* 139 (MICH); Mpio. Papantla, Papantla, 1841, *Liebmann s.n.* (GH), 1 km from Los Mangos towards Juan Díaz Covarrubias, 250 m, *Gómez Pompa* 4445 (GH); Mpio. Paso del Macho, 1 km NE of Atoyac, 500 m, *Nee & Taylor* 28950 (DAV); Mpio. Tantoyuca, Wartenberg, 1857-58, *Ervendberg* 153 (P), 199, 243 (GH); Mpio. Tepatlaxco, Atoyac to Tepatlaxco, *Velázquez* 280 (DAV); Mpio. Tepetzintla, Tepetzintla, 100 m, *Ventura* 1247 (TEX), 18 Mar 1971, *Chiang* 344 (GH), 2.7 km SE of Tepetzintla, 300 m, *Nee* 22398 (DAV); Mpio. Zongólica, El Palmar, 14 Mar 1944, *Santos* 2873 (MICH, TEX), 3034 (MICH).

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The illustrations were drawn by Sarah Thrasher.

LITERATURE CITED

- Bennett, J. 1859. Note on the species of *Croton* described by Linnaeus under the names of *Clutia eluteria* and *Clutia cascarilla*. J. Linn. Soc., Bot. 4: 26-30.
- Del Amo, S. 1979. *Plantas Medicinales del Estado de*

- Veracruz. Xalapa: Inst. Nac. Invest. sobre Recursos Bióticos.
- Gómez-Pompa, A. 1966. *Estudios Botánicos en la Región de Misantla, Veracruz*. México: Instituto Mexicano de Recursos Renovables.
- Govaerts, R., D. G. Frodin, and A. Radcliffe-Smith. 2000. *World Checklist and Bibliography of Euphorbiaceae (and Pandaceae)*. 4 vols. Richmond: Royal Botanic Gardens, Kew.
- Lindley, J. 1838. *Flora Medica*. London: Longman, Orme, Brown, Green, and Longmans.
- Martínez-Gordillo, M., and R. Cruz Durán. 2002. Especie nueva de la sección *Eluteria* Griseb. del género *Croton* (Euphorbiaceae) de Veracruz, México. *Anal. Inst. Biol. Univ. Nac. Aut. México, Bot.* 73(2): 141–145.
- Müller, J. 1866. *Croton*. In de Candolle, *Prodromus systematis regni vegetabilis* 15(2): 512–700.
- Webster, G. L. 1993. A provisional synopsis of the sections of the genus *Croton*. *Taxon* 42: 793–823.
- . 2001. Synopsis of *Croton* and *Phyllanthus* (Euphorbiaceae) in western tropical Mexico. *Contr. Univ. Michigan Herb.* 23: 353–388.
- , M. J. Del Arco-Aguilar, and B. A. Smith. 1996. Systematic distribution of foliar trichome types in *Croton* (Euphorbiaceae). *Bot. J. Linn. Soc.* 121: 41–57.