

Croton balsensis (Euphorbiaceae), a new species from the Balsas Depression, Mexico

Author(s) :Victor W. Steinmann and Martha Martínez Gordillo

Source: Brittonia, 59(4):380-384. 2007.

Published By: The New York Botanical Garden

DOI: [http://dx.doi.org/10.1663/0007-196X\(2007\)59\[380:CBEANS\]2.0.CO;2](http://dx.doi.org/10.1663/0007-196X(2007)59[380:CBEANS]2.0.CO;2)

URL: <http://www.bioone.org/doi/full/10.1663/0007-196X%282007%2959%5B380%3ACBEANS%5D2.0.CO%3B2>

BioOne (www.bioone.org) is a nonprofit, online aggregation of core research in the biological, ecological, and environmental sciences. BioOne provides a sustainable online platform for over 170 journals and books published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Web site, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/page/terms_of_use.

Usage of BioOne content is strictly limited to personal, educational, and non-commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

Croton balsensis (Euphorbiaceae), a new species from the Balsas Depression, Mexico

VICTOR W. STEINMANN¹ AND MARTHA MARTÍNEZ GORDILLO²

¹Instituto de Ecología, A.C., Centro Regional del Bajío, Av. Lázaro Cárdenas 253, A.P. 386, 61600 Pátzcuaro, Michoacán, Mexico; e-mail: victor.steinmann@cgu.edu

²Herbario de la Facultad de Ciencias, Universidad Autónoma de México, A.P. 70-399, Delegación Coyoacán, 04510 México, D.F., México; e-mail: mjmjg_unam@yahoo.com

Abstract. *Croton balsensis* (Euphorbiaceae), a new species endemic to the Balsas Depression of southern Mexico, is described and illustrated. It occurs in the states of Guerrero, Morelos, and Puebla, growing in tropical deciduous forest at elevations from 450 to 1850 m. It is best accommodated in *Croton* sect. *Cascarilla*. The Mexican species of this section are often quite similar, but *C. balsensis* is readily separated from related species by the possession of echinate ovaries and fruits.

Key words: Balsas Depression, *Croton*, Euphorbiaceae, Mexico.

Resumen. Se describe e ilustra *Croton balsensis*. Es endémica de la cuenca del río Balsas en el sur de México. Crece en los estados de Guerrero, Morelos y Puebla a altitudes de 450 a 1850 m en bosque tropical caducifolio. Pertenecce a *Croton* sect. *Cascarilla*. Las especies mexicanas de esta sección por lo general son parecidas y *C. balsensis* se distingue por tener ovarios y frutos equinados.

Croton L. is the second largest genus in the Euphorbiaceae and contains approximately 1200 species (Govaerts et al., 2000). Martínez (1995) reported 23 species from the Mexican state of Guerrero, among them *Croton fragilis* H.B.K. She characterized this species as possessing echinate ovaries and capsules, but noted that it belongs to a complex much in need of revisionary studies. The name *Croton fragilis* has been broadly applied to many taxa, both within and outside of Mexico, and Webster (2001) went as far as to question its presence in Mexico. It was described from plants collected in Venezuela, and the holotype (*Humboldt & Bonpland s.n.*, P) represents a taxon different from Martínez's concept in that the ovaries are not echinate. To our knowledge, these echinate-ovariated plants are only found in the Balsas Depression of central Mexico, an east-west oriented drainage basin comprising approximately 112,320 km² located between the crest of the Transvolcanic Axis to the north

and the crest of the Sierra Madre del Sur to the south. Because they do not correspond to any previously described species, we here propose them as new.

Croton balsensis V. W. Steinm. & Martínez-Gordillo, **sp. nov.** Type: Mexico. Puebla: Mpio. Atoyatempan, Cañada de Acatzitzimitla, matorral alto con bambú, 1850 m, 28 Jun 1982, F. G. Medrano, B. González & D. Nava 12679 (holotype: MEXU). (Fig. 1)

Frutex 0.5–3(–4) m altus, monoecius; folia alterna; petioli 0.6–2(–3.5) cm longi, tomentosi; laminae ovatae vel lanceolatae, 4–8.7(–13) cm longae, 1.5–5(–8.5) cm latae, apice acuminato, mucronato, basi acutata, obtusa vel subcordata, supra glabrata, subtus stellato-tomentosa, margine integro; inflorescentia terminalis, 4.8–5.5(–8.5) cm longa, bracteis lanceolatis, 0.8–1.2 mm longis, margine integro; florum staminatorum calyx lobis 5, ovatis, 1.4–2 mm longis, 0.5 a 1.2 mm latis, aequalibus, margine integro, petalis albidis, spatulatis, 2.4 mm longis, 0.8 mm latis, aequalibus, supra et subtus glabris, margine ciliato; florum pistillorum calyx lobis 5(6), lanceolatis, 1–1.2 mm longis, aequalibus, petalis absentibus; ovarium subglobosum, stellato-tomentosum, echinatum;

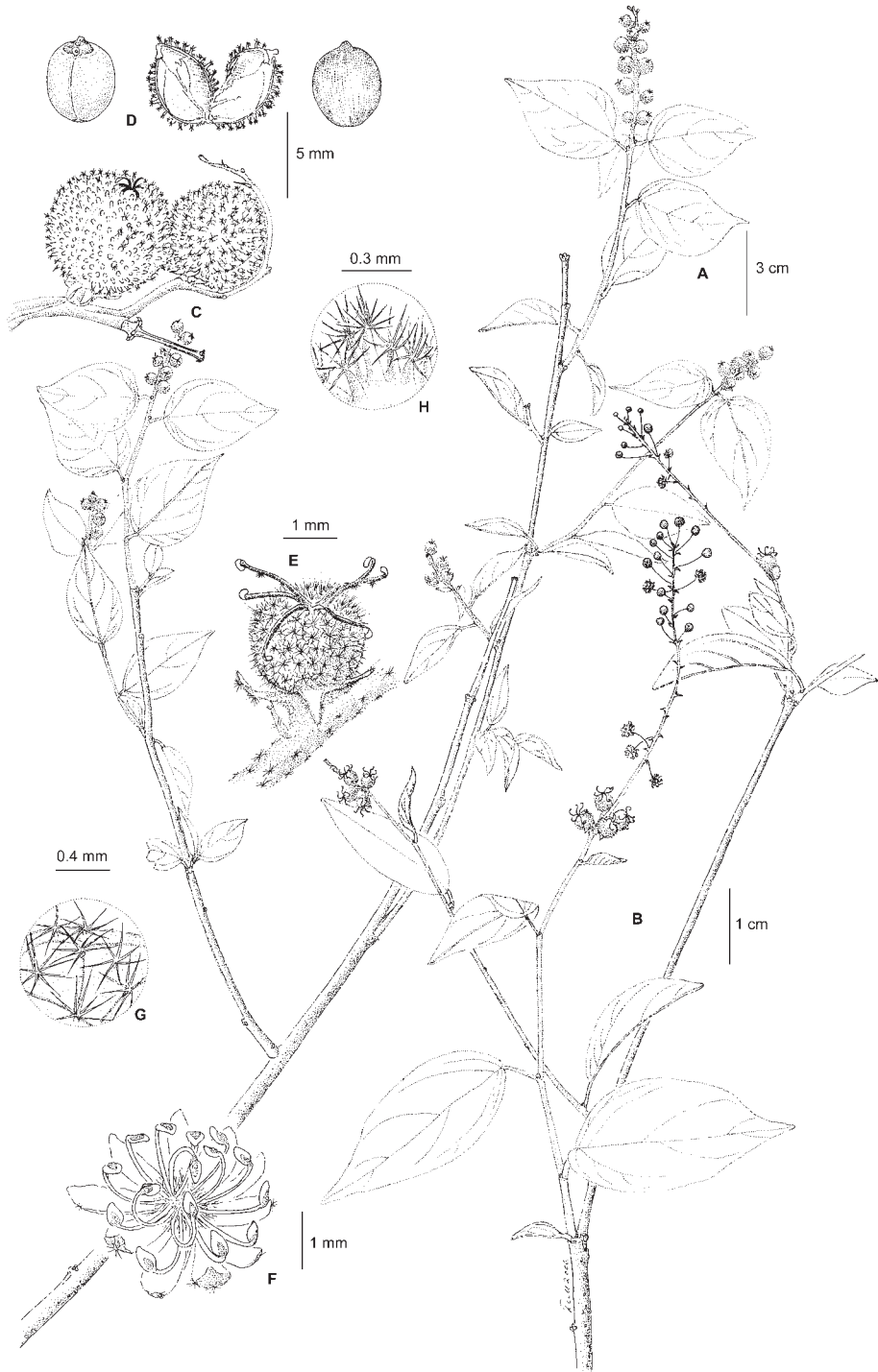


FIG. 1. *Croton balsensis*. **A.** Branch with fruits. **B.** Branch with flowers. **C.** Fruits. **D.** Seed (ventral and dorsal view) and dehiscent coccus. **E.** Pistillate flower. **F.** Staminate flower. **G.** Pubescence of lower leaf surface. **H.** Close-up of fruit surface. (A, G, H from *Moreno 225*, FCMW; B, E, F from *Moreno 921*, FCME; C, D from *Jiménez 49*, FCME).

styli 3, bipartati, 2–2.5 mm longi; capsula subglobosa, 6–8 mm longa, 6.5–7.6 mm lata, echinata; semina elliptica, 3.6–5.3 mm longa, 3–4.7 mm lata.

Shrubs 0.5–3(–4) m tall, monoecious; branches generally smooth, glabrous in age, bark grayish brown. Leaves alternate; stipules rudimentary; petioles 0.6–2(–3.5) cm long, tomentose; blades 4–8.7(–13) × 1.5–5(–8.5) cm, ovate to ovate-lanceolate, base acute to obtuse, occasionally subcordate, apex generally acuminate, mucronulate, margin entire to slightly repand, venation actinodromous with 3 basal nerves, glabrescent on the upper surfaces, tomentose on the lower surface with whitish hairs, lacking glands. Inflorescences terminal bisexual thyrses 4.8–5.5(–8.5) cm long, with pistillate flowers at the base and staminate flowers towards the apex, without bisexual cy-mules; staminate bracts 0.8–1.2 × 0.3–0.4 mm, lanceolate, pubescent, apex acute, margin entire, subtending a single flower, pistillate bracts 1–1.2 mm × 0.3–0.4 mm, similar to those of the staminate flowers. Staminate flowers actinomorphic; pedicel 2.8–5.7(–11) mm long, glabrous or with scattered stellate hairs; sepals 5, ovate, 1.4–2 × 0.5–1.2 mm, equal, united at the base, pubescent on the outer surface, apex obtuse, margin entire; petals 5, spatulate, 2.4 × 0.8 mm, equal, free, glabrous on both surfaces, white, base cuneate, apex obtuse, margin ciliate with unbranched hairs; stamens 15, filiform, 1.6–2.2 mm long, villous towards the base; anthers oblong, 0.5–0.6 mm long. Pistillate flowers actinomorphic; pedicel stout, 0.5–1.1 mm long, stellate pubescent; sepals 5 or occasionally 6, 1–1.2 × 0.5–0.7 mm, lanceolate, equal, free, pubescent in both surfaces, apex subacute, margin entire, withering in fruit; petals absent; ovary subglobose, tomentose when young, echinate with stellate hairs at the end of an elongate protuberance 0.1–1.1 mm long; styles 3, 2–2.5 mm long, bifurcate one time. Capsules subglobose, 6–8 × 6.5–7.6 mm, echinate, stellate-pubescent, septically and loculicidally explosively dehiscent into three 2-valved cocci; columella 4.2–5.1 mm long. Seeds elliptic, 3.6–5.3 × 3–4.7 mm, brown-gray, dorsiventrally compressed, smooth, with a yellowish caruncle 0.3–0.7 × 1.1–2.4 mm.

Distribution and habitat. *Croton balsensis* is endemic to the Balsas Depression of southern Mexico, occurring in the states of Guer-

rero, Morelos, and Puebla; it is also expected to grow in Oaxaca. It grows in tropical deciduous forest at elevations from 450 to 1850 m. In some locations it is reported as common, and the collections are sufficiently numerous and widespread, which suggests that it is not under any current threat of extinction.

Phenology. Plants are drought deciduous; flowering occurs from May to July, with fruits maturing from July to October.

Common name. In Mezcala, Guerrero, it is known locally as “aceitillo de hoja ancha” (Martínez, 1995).

Additional specimens examined. MEXICO.

GUERRERO: Mpio. Huamuxtitlán, 4.5 km al N de Huamuxtitlán, 17°53'09"N, 98°33'59"O, 1040 m, 23 Jun 1981, *Aguilar 35* (FCME); Mpio. Huamuxtitlán, 6 km al SE de Huamuxtitlán, hacia Tlaquiltepec, 17°44'09"N, 98°30'59"O, 1100 m, 24 Jun 1981, *Aguilar 66* (FCME); Mpio. Zumpango del Río, “El Túnel”, antigua carretera México-Acapulco, 29 km del Puente Balsas, 17°22'59"N, 99°27'O, 665 m, 1 Sep 1983, *Aguilar 190* (FCME); Mpio. Zumpango del Río, 7 km de la desviación a Filo de Caballo de la carretera Iguala-Chilpancingo, 17°56'15"N, 99°22'10"O, 720 m, 2 Sep 1983, *Aguilar 196* (FCME); Mpio. Copalillo, 2 km al E del Balneario Atotonilco, Papalutla, cerca de la estación, 18°6'43"N, 98°48'97"O, 710 m, 22 Aug 1992, *Beristain 81* (FCME); Mpio. Eduardo Neri, Mezcala, 1 km al S, 17°55'28"N, 99°36'3"O, 460 m, 30 Jun 1994, *Calónico 841* (FCME); Mpio. Eduardo Neri, Cañada El Tigre, 2 km al E de Venta Vieja, 570 m, 14 Aug 1994, *Calónico 1146* (FCME); Mpio. Leonardo Bravo, Chichihualco, 5.94 km al NO, rumbo al Naranjo, 17°42'08"N, 99°41'36"O, 1140 m, 6 Jul 1998, *Calónico 9140* (FCME); Mpio. Xochihuehuetlán, cerro Xilotzín, 3 km al NW de Xilotepec, 17°56'85"N, 98°28'30"O, 1650 m, 22 Jun 1981, *Contreras 970* (FCME); Mpio. Atenango del Río, 4 km de la desviación a Santa Cruz, 18°10'44.4"N, 99°07'45.5"O, 931 m, 17 June 2000, *Delgado 80* (FCME); Mpio. Atenango del Río, Cerro la Víbora, frente al plan de Mayocingo, 18°05'14.7"N, 99°5'56.6", 981 m, 17 Jun 2000, *Delgado 112* (FCME); Mpio. Eduardo Neri, 22 km de Zumpango del Río rumbo a Mezcala, 200 m de la carretera, 08 Sep 2002, *Diego & de Santiago 9510* (IEB); Mpio. Eduardo Neri, 0.9 km al E de Venta Vieja, 17°49'04"N, 99°33'08"O, 750 m, 14 Aug 1994, *García 183* (FCME, MEXU); Mpio. Eduardo Neri, 1 km al N de Venta Vieja, sobre la carr. Chilpancingo-Acapulco, 750m, 29 Sep 1983, *Jiménez 49* (FCME); Mpio. Tepecuacuilco, 4.5 km al SE de Palula, hacia Ahuelican, 18°03'06"N, 99°28'59"O, 850 m, 26 Jun 1981, *Limón s.n.* (FCME); Mpio. Eduardo Neri, 2 km de la colonia Valerio Trujano, rumbo a Atzala, 17°55'59"N, 99°36'59"O, 720 m, 13 Jul 1991, *Luna 59* (FCME, IEB), 610 m, 13 Jul 1991, *Luna 62* (FCME); Mpio. Eduardo Neri, 6 km de Valerio Trujado, rumbo a Atzala, 800 m, 13 Jul 1991, *Luna 70* (FCME); Mpio. Eduardo Neri, 40 km al S de Mezcala sobre la carretera México-Acapulco, 820 m, 12 Sep 1986, *M. Martínez G. 142* (FCME); Mpio. Zumpango del Río, a

2 km al NO de Xochipala, 1200 m, 5 Oct 1988, *E. Martínez S. 24086* (MEXU); Mpio. Eduardo Neri, Cañón del Zopilote, desviación a Filo de Caballo, carretera México-Acapulco, 17°48'27"N, 99°33'54"O, 650 m, 10 Jul 1981, *Monroy 7* (FCME); Mpio. Eduardo Neri, Mezcala, 11 km al S, 17°51'09"N, 99°34'44"O, 600 m, 5 Jul 1994, *Monroy 316* (FCME, IEB); Mpio. Eduardo Neri, Venta Vieja, 1.6 km al N, 17°49'37"N, 99°33'38"O, 700 m, 30 Sep 1994, *Monroy 668* (FCME); Mpio. Eduardo Neri, Cañada de los Morros, 21 km al S de Mezcala, 45°13'N, 99°39'O, 1350 m, 4 Jul 1980, *Monzón s.n.* (FCME); Mpio. Eduardo Neri, Cerro Papalotepec, al S de Xochipala, 17°45'13"N, 99°36'59"O, 1300 m, 30 Jun 1980, *Monzón 165* (FCME); Mpio. Eduardo Neri, zona arqueológica, 3 km al S de Xochipala, 17°47'6"N, 99°38'14"O, 1000 m, 15 Jul 1991, *Moreno 225* (FCME); Mpio. Eduardo Neri, Xochipala, 17°48'46"N, 99°38'19"O, 1000 m, 12 July 1991, *Moreno 244* (FCME); Mpio. Xochihuehuetlán, paraje Palo Verde, 1 km al O de Xilotepec, Cerro Xilotzin, 17°57'57"N, 98°29'29"O, 1200 m, 28 Jun 1993, *Moreno 276* (FCME); Mpio. Xochihuehuetlán, La Presa, lado NE del Cerro Xilotzin, aproximadamente 4 km por el camino de Acaxtla huacan, 1400 m, 20 Aug 1993, *Moreno 430* (FCME); Mpio. Xochihuehuetlán, Loma del Capiri, 2.1 km al NNO de Xilotepec, Cerro Xilotzin, 17°58'26"N, 98°29'56"O, 1360 m, 22 Aug 1993, *Moreno 485* (FCME); Mpio. Xochihuehuetlán, Cañada Las Pozas, 2.5 km al NO de Xilotepec, Cerro Xilotzin, 17°57'59"N, 98°30'03"O, 1380 m, 12 Aug 1994, *Moreno 838* (FCME); Mpio. Xochihuehuetlán, paraje Palo Verde, 1.5 km al NO de Xilotepec, Cerro Xilotzin, 17°58'07"N, 98°29'42"O, 1290 m, 17 May 1995, *Moreno 921* (FCME); Mpio. Eduardo Neri, 2 km al SE de Xochipala, 17°46'N, 99°37'O, 1050 m, 29 Sep 1990, *Peralta 24* (FCME); Mpio. Eduardo Neri, 5 km al E de Xochipala, 1100 m, 12 Aug 1964, *Rzedowski 18658* (MEXU); Mpio. Zumpango del Río, en la desviación a Filo de Caballo, 69 km al S de Iguala, 740 m, 14 Aug 1985, *Soto 9818* (MEXU); Mpio. Eduardo Neri, a 3 km del entronque de la Autopista México-Acapulco, rumbo a Xochipala, 17°45'44"N, 99°34'59"O, 940 m, 4 Jul 1980, *Torres 183* (FCME); Mpio. Huiztucu de los Figueroa, 1.8 km al E de San Francisco Ozomatlan, 17°54'N, 99°17'O, 1040 m, 25 Jul 1988, *Vaca 95* (FCME); Mpio. Zumpango del Río, 5 km al E de Xochipala, 1020 m, 18 Aug 1987, *Valencia 383* (MEXU). **MORELOS:** Mpio. Jojutla, Cerro de Higuero, ca. 2 km sur del centro del Mpio., cerca de 18°35'20.8"N, 99°09'10.4"W, cuesta este del cerro, 1100–1200 m, 29 Jul 1997, *Raz & Juárez 93* (IEB); Mpio. Jojutla, Cerro de Higuero, ca. 2 km south of town center, near 18°35'09.1"N, 99°09'03.1"W, east facing slopes, 1200 m, 6 Aug 1997, *Raz et al. 159* (IEB).

Following Webster's (1993) subgeneric classification, *Croton balsensis* belongs to section *Velamea* Baill. Features that support this placement include alternate leaves with reduced stipules, vegetative glands absent, inflorescences without bisexual cymules, staminate flowers with sepals and petals, pistillate flowers with well-developed sepals that are equal

in size, but lacking petals, and bifid styles. However, Berry et al. (2005) demonstrated that this section is synonymous with section *Cascarilla* Griseb., a taxon that Webster (1993) noted to be very similar to section *Velamea* and distinguished only in having paired glands at the leaf base. The western and central Mexican species of this group are often quite similar, and superficially *C. balsensis* resembles *C. flavescens* Greenm. (= *C. morifolius* Willd. var. *brandegeanus* (Croizat) G. L. Webster), *C. mazapensis* Lundell, *C. morifolius* Willd., *C. roxanae* Croizat, and *C. sonora* Torr. It is difficult to single out a particular species to which *C. balsensis* might be most closely related, but the rudimentary stipules and glabrous or nearly glabrous staminate pedicels make it morphologically most similar to *C. roxanae* and *C. sonora*. *Croton balsensis* is readily separated from these and the others by the possession of echinate ovaries and fruits. This feature is very unusual among the species of *Croton*, and the only other Mexican taxa that we know of to possess it are *C. arboreus* Millsp. and the recently described *Croton gomezii* G. L. Webster (Webster, 2005), both in section *Eluteria* Griseb. It is also present in the *Croton saltensis* Griseb. complex (sect. *Cascarilla* Griseb.) of northwestern Argentina and southeastern Bolivia, as well as in a group of species centering around *Croton medusae* Müll. Arg. (sect. *Cyclostigma* Griseb.) in southeastern Brazil.

Although we have examined many specimens of *Croton balsensis*, the majority of these were made by collectors associated with the herbarium of the Facultad de Ciencias, Universidad Autónoma de México (FCME). We are unaware of any widely distributed collections, and the specimen chosen to serve as the holotype is the best in that it has flowers of both sexes as well as fruits.

Acknowledgments

We thank Ramiro Cruz Durán for the excellent illustration, two anonymous reviewers for helpful comments on the manuscript, and the curators and staffs of FCME, IEB, and MEXU for permitting access to their collections. Financial support was provided by a grant from the Consejo Nacional de Ciencia y Tecnología (CONACYT) and the Comisión

Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO) to the Instituto de Ecología, A.C. (account 92–907).

Literature Cited

- Berry, P. E., A. L. Hipp, K. J. Wurdack, B. Van Ee & R. Riina.** 2005. Molecular phylogenetics of the giant genus *Croton* and tribe *Crotonaeae* (Euphorbiaceae sensu stricto) using ITS and *trnL-trnF* DNA sequence data. *American Journal of Botany* 92: 1520–1534.
- Govaerts, R., D. G. Frodin & A. Radcliffe-Smith.** 2000. World checklist and bibliography of the Euphorbiaceae (with Pandaceae). *World Checklists and Bibliographies* 4, Royal Botanic Gardens, Kew.
- Martínez G., M.** 1995. Contribución al conocimiento del género *Croton* (Euphorbiaceae) en el estado de Guerrero, México. *Contribuciones del Herbario de la Facultad de Ciencias, UNAM* 2: 1–109.
- Webster, G. L.** 1993. A provisional synopsis of the sections of the genus *Croton* (Euphorbiaceae). *Taxon* 42: 793–823.
- . 2001. Synopsis of *Croton* and *Phyllanthus* (Euphorbiaceae) in western tropical Mexico. *Contributions from the University of Michigan Herbarium* 23: 353–388.
- . 2005. A new Mexican species of *Croton* section *Eluteria* (Euphorbiaceae). *Lundellia* 8: 12–16.