



A synopsis of *Coulteria* (Leguminosae), including new names and synonyms

SOLANGE SOTUYO¹, JOSÉ LUIS CONTRERAS², EDELINE GAGNON³ & GWILYM P. LEWIS⁴

¹*jssotuyo@ib.unam.mx Departamento de Botánica, Instituto de Biología, Universidad Nacional Autónoma de México.*

²*Facultad de Arquitectura, Benemérita Universidad Autónoma de Puebla. 4 Sur 104. Col. Centro. CP 72000. Puebla, Puebla.*

³*Institut de Recherche en Biologie Végétale, Département de Sciences biologiques, Université de Montréal, 4101 rue Sherbrooke est, Montréal, Québec, Canada, H1X 2B2*

⁴*Comparative Plant and Fungal Biology Department, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AB, U.K.*

Abstract

As a result of ongoing studies in *Caesalpinia* sensu lato, new combinations and synonyms are proposed in the reinstated segregate genus *Coulteria*.

Key words: *Brasilettia*, *Guaymasia*, *Caesalpinia*, Caesalpinieae, *Coulteria*, Fabaceae, nomenclature

Introduction

Prior to morphological (Lewis and Schrire, 1995; Nores *et al.*, 2012) and molecular (Simpson *et al.*, 2003; Nores *et al.*, 2012; Gagnon *et al.*, 2013; Gagnon *et al.*, 2016) phylogenetic studies, *Caesalpinia* sensu lato included 25 genus names in synonymy and comprised c. 150 species, mostly in the Palaeo- and Neotropics (Lewis, 1998). Gagnon *et al.* (2013) confirmed that all the species placed in *Caesalpinia* in its broadest circumscription are not a monophyletic group and should be recognised in several distinct genera. New combinations have been proposed for the majority of species occurring in México, USA, Central and South America (Gagnon *et al.*, 2016) to reflect the latest phylogenetic data, but some are still needed in a few genera where species delimitations remain unclear. One of the groups requiring such attention is the genus *Coulteria*, a genus occurring across Central America and México and also indigenous in parts of northern South America.

Currently, there exists no comprehensive account of the whole genus. This is, in part, due to past uncertainty of the taxonomic status of *Coulteria*, which has been resolved in recent molecular phylogenetic studies (Simpson *et al.*, 2003; Bruneau *et al.*, 2008; Manzanilla and Bruneau, 2012; Nores *et al.*, 2012; Gagnon *et al.*, 2013; Gagnon *et al.*, 2016). *Coulteria* forms a well-supported monophyletic group, sister to the genus *Tara*. Such a relationship supports the earlier phytochemical findings of Kite & Lewis (1994) and the reinstatement of *Coulteria* proposed by Lewis (2005). A combination of morphological synapomorphies help diagnose the *Coulteria* clade: all species are dioecious, with flowers that typically have a lower cucullate sepal with a glandular-pectinate margin, suggestive of a pseudo-copulatory insect (probably bee) pollination system, have a flat papyraceous, indehiscent or tardily dehiscent (along one suture) fruit, leaflets which are (sometimes inconspicuously) pellucid-punctate, and a style which has a groove in its adaxial suture from base to stigma (Contreras, 1991). The genus is also characterised by a distinctive seed chemistry (the seeds produce substituted phenylalanines derived via a shikimic acid metabolic pathway; Larsen *et al.*, 1975; Kite and Lewis, 1994) and the presence of prismatic crystals in ray cells and a chambered axial parenchyma in its wood (Gasson *et al.*, 2009). A line drawing showing morphological characters can be seen in Figure 1.

The number of species that have been included within this group has varied amongst different authors. The genus was first described by Kunth (1824), who included three species, but did not designate a type species. Two of the three species, *Coulteria horrida* Kunth and *C. tinctoria* Kunth, have long been considered as synonyms of *Caesalpinia spinosa* (Molina) Kuntze (= *Tara spinosa* (Molina) Britton & Rose). While this species has a lower cucullate sepal with a pectinate margin, it lacks the typical flat, papyraceous fruit that characterises the genus *Coulteria* (Gagnon *et al.* 2013; Gagnon *et al.*, 2016). The third species, *Coulteria mollis* Kunth, becomes the type species of *Coulteria* by default and is formally selected as such by Gagnon *et al.* (2016). Britton and Rose (1930) took up the generic name

Brasilettia (DC.) Kuntze (1891) for the group (originally described as *Caesalpinia* section *Brasilettia* by de Candolle, 1825) and included eight species; they also established a monospecific genus *Guaymasia* based on a species in the *Caesalpinia* group from the Sonoran Desert, that was distinct by its shrubby habit, reduced leaves and suborbicular to oval fruit. Molecular phylogenetic analysis shows that *Guaymasia pumila* belongs in *Coulteria*, a finding supported by the presence of the same diagnostic flower and fruit characters.

While several phylogenetic studies have included a dense taxonomic sampling of *Coulteria*, with multiple specimens per species (Simpson *et al.*, 2003; Nores *et al.*, 2012; Gagnon *et al.*, 2013; Gagnon *et al.*, 2016), no evidence has been found for the monophyly of the species described by Britton and Rose (1930), with the exception of *Guaymasia pumila*. Even after sampling five chloroplast genes and the nuclear ribosomal marker ITS for seven different species, Gagnon *et al.* (2016) found no strong branch support or phylogenetic resolution within the *Coulteria* clade. Their results suggest that species, as currently circumscribed, are either polyphyletic (possibly by reticulate evolution, such as hybridisation, though there is currently no documented evidence of hybrid individuals), or that species are closely-related and need further in-depth phylogenetic studies to clearly recover relationships amongst the different species within the genus.

Notwithstanding the need for further detailed molecular and morphological species-level investigations, there is still good evidence for the existence of seven species of *Coulteria*, based on revision of material in herbaria, as well as on field studies (Contreras 1991). Most species are broadly distributed, tolerate wide geological heterogeneity and display morphological variability in vegetative and floral characters. We present here a short synopsis of the genus, including a key to the seven currently recognised species, five of which are newly proposed combinations.

Taxonomy, including new combinations.

Coulteria Kunth, Nov. Gen. Sp. 6 ed. fol. 258 (1824), 6 ed. qu. 328 (1824), (excluding t. 568 & 569 which = *Tara spinosa* (Molina) Britton & Rose); descr. emend. E. Gagnon, Sotuyo and G.P. Lewis; type species not designated in the protologue; *Coulteria mollis* Kunth designated in Gagnon *et al.* (2016).

Brasilettia sensu Britton & Rose in N. Amer. Fl. 23(5): 320 (1930), non *Brasilettia* (DC.) Kuntze, Rev. Gen. 1: 164 (1891), nec *Caesalpinia* Sect. *Brasilettia* DC., Prodr. 2: 481 (1825).

Guaymasia Britton & Rose in N. Amer. Fl. 23(5): 322 (1930).

Trees or shrubs, dioecious; leaves pari-bipinnate, leaflets pellucid-punctate; abaxial sepal cucullate, glandular-pectinate; male flowers with stamen filaments equal in length to, or slightly longer than, petals, rudimentary ovary short and with sterile ovules, female flowers with ovary and style well developed, longer than stamen filaments, anthers without pollen; legume flat, stipitate, chartaceous to membranaceous, indehiscent or (in some species) opening tardily along one suture, spongy-septate (or not), each chamber with one laterally compressed, transversally orientated seed, this lacking a pleurogram, $2n=24$

Geographical Distribution:—The genus *Coulteria* occurs mainly in México, with two species also occurring elsewhere: *Coulteria cubensis* extends to Belize, Aruba, Cuba, Jamaica and Curaçao, and *Coulteria mollis* reaches Colombia and Venezuela, including Isla Margarita (Figure 3).

The species grow in a range of dry vegetation types, including seasonally dry tropical forest, semi-deciduous tropical forest and xerophytic scrub forest, at elevations from 0–1200 meters above sea level, although most species are found in coastal areas below 200 meters elevation and some occur inland in ravines and gullies. They grow in sandy, calcareous or metamorphic substrates, some species are endemic on limestone. There are four principal regions where the species are located 1) the occidental coast of México, from southern Sonora to the Isthmus of Tehuantepec in Oaxaca, 2) the dry eastern limestone slopes of the Sierra Madre Oriental in Guanajuato, Hidalgo, Querétaro, San Luis Potosí and Tamaulipas, 3) the Río Balsas Depression/Tehuacán-Cuicatlán valley, with two distinct subregions: a) Lower basin, including Infiernillo and the Tepalcatepec basin river and b) High basin, from Cañón del Zopilote to the Tehuacán-Cuicatlán valley border, between 800–1200 m, and 4) the Caribbean region, northern South America and the dry valleys of Guatemala and Nicaragua.

Key to species of *Couleria*

1. Legume 4–7 × 1.3–3 cm, oblong, elliptic, suborbicular to broadly oval; shrubs or small trees up to 3 m in height2
- Legume 7–15 × 2.5–5 cm, oblong to elliptic; medium to large trees, more than 3 m in height3
2. Shrubs; leaflets glabrous, suborbicular, 0.6–2.5 × 0.5–2.5 cm; legume 4–4.5 × 1.3–2.3 cm, suborbicular to broadly ovate, apiculate, 1–2-seeded; endemic along coastal plains and on rocky hills in Sonora, México *C. pumila*
- Shrubs or small trees; leaflets densely pubescent below, obovate, 1.7–8.5 × 1.2–4.5 cm; legume 5–7 × 2.5–3 cm, oblong to elliptic, mucronate, densely pubescent on both surfaces, 1–3-seeded; in dry forest and bushland, in Hidalgo, Querétaro, San Luis Potosí, Tamaulipas and Guanajuato, México *C. pringlei*
3. Legume borne on a stout stipe, 3–4 mm long, legume pedicel about 1 cm long, this pubescent or tomentose, leaflets pilose to glabrate on the adaxial surface and pubescent to glabrate on the abaxial surface4
- Legume stipe slender, 6–10 mm long or longer, legume pedicel 1.3–1.7 cm long, leaflets and fruits with a diverse range of indumentata5
4. Young branchlets and inflorescences sericeous or pubescent; legume oblong, 7–14 × 3–4 cm, glabrous; leaflets oblong-lanceolate, 3–6 × 1.5–3 cm, glabrous *C. glabra*
- Young branchlets and inflorescences ferrugineous-tomentose; legume tomentose, oblong-elliptic, 9–11 × 2.8–4 cm; leaflets pilose except along the midvein below, ovate, 2–6.2 × 1–2.5 cm *C. platyloba*
5. Legume 10–15 × 2.5–5 cm, borne on a 10–15 mm long stipe, legume velvety, pilose or glabrate at maturity; leaflets densely short-pubescent, elliptic, apex acute or rounded *C. velutina*
- Legume 6–13.5 × 2.5–4 cm, borne on stipe 7–10 mm long, or as long as the pedicel, legume, tomentose to puberulent when mature; leaflets elliptic-lanceolate to ovate-lanceolate, apex acute6
6. Leaflets elliptic-lanceolate, glabrous and shiny above, the lateral veins elevated above the blade surface, the margin thick, pubescent, or glabrous below; legume 4–15 × 2.5–4 cm, glabrate, stipe plus pedicel 16–20 mm long *C. cubensis*
- Leaflets ovate-lanceolate, densely pilose, to glabrate, dull above, lateral veins not elevated above the blade surface, the margin thin; fruit 6–10 × 2.5–3 cm, densely pilose to glabrate, stipe plus pedicel more than 20 mm long *C. mollis*

Couleria cubensis (Greenm.) S. Sotuyo & G.P. Lewis **comb. nov.**

Caesalpinia cubensis Greenm., Trans. Acad. Sci. St. Louis 7: 416, pl. 32 (1897). Type: Cuba, Cienfuegos, Castillo de Jagua, *R. Combs* 571 (holotype MO; isotypes F, GH, K!, MO, P, US).

Peltophorum brasiliense Urb., nom. superfl. as *Caesalpinia cubensis* Greenm. is cited in synonymy., not *C. brasiliensis* L.

Baryxylum brasiliense Pierre, nom. superfl. based on the above name.

Couleria linnaei Acev.-Rodr., in Cat. Seed Pl. West Indies, Smithsonian Contr. Bot. 98: 419 (2012), nom. superfl., based on the misapplied name *Peltophorum linnaei* Griseb. in Fl. Brit. W. Indian Islands: 206 (1860) but superfluous as *Caesalpinia cubensis* Greenm. is cited in synonymy.

Robinia violacea Mill., in Gard. Dict. (ed. 8): without page number, no. 8 (1768), Type: México, Veracruz, *Houston* s.n. (lectotype BM), nom. illeg., non Jacq. (1760).

Brasilettia violacea Britton & Rose in N. Amer. Fl. 23(5): 321 (1930), nom. nov. for *Robinia violacea* Mill., but nom. illeg. This name was based on *Robinia violacea* Mill., an illegitimate later homonym of *Robinia violacea* Jacq.

Caesalpinia violacea (Britton & Rose) Standl., Publ. Carnegie Inst. Wash. 461: 61 (1935).

Distribution:—Antilles: Aruba, Cuba, Curaçao, Jamaica; México: Yucatán, Quintana Roo; Belize.

Habitat:—Seasonally dry and deciduous forests on upper slope limestone ridges and knolls.

Selected specimens:—ARUBA. 1909–1910, *I. Bolding* 6479 (NY). CURAÇAO. roadside rift, 20–27 March 1913, *N.L. Britton & J.A. Shafer* 3084 (NY); Groot Sint Joris, 21 March 1917, *H.M. Curran & M. Haman* 381 (NY). JAMAICA. Thicket road to Postdam, 6–8 September 1907, *N.L. Britton* 1257 (NY); Little Goat Island, Old Harbour Bay, 3 March 1908, *N.L. Britton & A. Hollick* 1842 (NY). CUBA. Pinar del Río: 18 March 1924, *E.L. Ekman* 18782 (NY); Cienfuegos Soledad, 15 February 1927, *J.G. Jack* 4742 (NY); Santa Clara, Milpa, Cienfuegos Bay region, June 1941, *R.A. Howard* 5424 (NY 2610). MÉXICO. Quintana Roo: 5 km al sur de Akumal, carretera Cancún Tulum, 27 June 1984, *E. Cabrera y H. de Cabrera* 6506 (NY); Carrillo Puerto 5 km al Noroeste, 8 September 1986, *R. Duran & I. Olmstead* 482 (NY); Isla Mujeres, [21° 15' N 86° 45' O], 5 December 1981, *J.S. Flores & E. Ucan* 8383 (F 1948982); [21° 15' N 86° 45' O], 13 May 1981, *J.S. Flores & E. Ucan* 1031 (F 1950062); [21° 15' N 86° 45' O], 4 August 1981, *J.S. Flores & E. Ucan* 8822 (F 1950205); Cobá east of ruins, 2 July 1938, *C.L. Lundell & A.A. Lundell* 7757 (F 1305834). Yucatán: Thien-Welden Dzibilchaltun Survey site X, 5 July 1979, *Bradburn & S. Darwin* 1382 (NY); Hoxo, April 1917, *G.F. Gaumer* 23791 (NY); Near Piste, May–August 1938, *C.L. Lundell & A.A. Lundell* 7346, (F 1309017, NY); Chichen Itzá, 6 June 1938, *C.L. Lundell & A.A. Lundell* 7405 (F 1308818, NY); Izamal, without date, *G.F. Gaumer* 4141, (US 571648); Kancab, May 1917, *G.F. Gaumer & sons* 23898, 23866 (F 466384, 466332); Las Bocas de Silam, May 1916, *G.F. Gaumer & sons* 23337 (F 446833, 446834); Izamal, without date, *G.F. Gaumer*

s.n. (F); without locality, 1917–1921, *G.F. Gaumer 24101* (F 552105, NY); Izamal, without date, *G.F. Gaumer 461* (F 58559, 438097); without locality, 1937, *M. Stegerda s.n.* (F 890403); Tunkas, 4 Abril 1956, *O.G. Enriquez 541* (F 1761530). BELIZE. Orange walk district. Rio Bravo conservation and management area, 24 July 1988, *B.L. Nicholas 282, 283* (NY).

Coulteria glabra (Britton & Rose) J.L. Contreras, S. Sotuyo & G.P. Lewis, **comb. nov.**

Brasilettia glabra Britton & Rose, N. Amer. Fl. 23(5): 321 (1930). Type:—México, Colima *E. Palmer 1010* (holotype NY, photos K!, FCME!; isotypes K!, MICH, photo MEXU!).

Caesalpinia colimensis F. J. Herm., J. Wash. Acad. Sci. 38(7): 237 (1948). Type as for *Brasilettia glabra* Britton & Rose. Hermann (1948), when transferring *Brasilettia glabra* Britton & Rose to the genus *Caesalpinia*, was obliged to provide a new species epithet because the binomial *Caesalpinia glabra* (Mill.) Merrill (1910) already existed.

Distribution:—México, known from Sinaloa, Colima, Michoacán, Guerrero and Oaxaca along the Pacific coast.

Habitat:—Tropical deciduous forest, thorn forest, in woodland on rocky bluffs near the Pacific Ocean.

Selected specimens:—MÉXICO. Sinaloa: Los Mochis 22.5 km al noroeste, 10 December 1997, *R. Grether & H. Quero s.n.* (MEXU 20927). Colima: Manzanillo, Laguna de Cuyutlan 25 mi southeast of Manzanillo, 22 July 1957, *R. McVaugh 15622* (NY); Los Tepames-Las Tinajas, 7 November 1977, *R.J. Hill et al. 1825* (NY). Michoacán: Apatzingan 4 mi west, 8 August 1941, *W.M.C. Leavenworth & H. Hoogstraal 1380* (F 1218802); Apatzingan hacienda California, 12 August 1941, *W.M.C. Leavenworth 1466* (F, MO, NY). Guerrero: Acapulco, October 1894 to March 1895, *E. Palmer 385* (F 265635, 265636, NY); Acapulco Playa Hornitos, 5 January 1944, *F.A. Barclay 14141* (F 1409098). Oaxaca: Villa de Tututepec de Melchor Ocampo, San José del Progreso, a 5 km al S, en el camino a Las Lagunas de Chacahua 27 June 1977, *M. Sousa S. et al. 7659* (MEXU); Armenta, 4 km al Oeste de Mancuernas, 10 February 1976, *M. Sousa S. et al. 235* (US 2790019).

Coulteria mollis Kunth, Nov. Gen. Sp. 6: 330 (1824). Type:—Colombia, Sta. Martha, *C.L.G. Bertero s.n.* (holotype P, P02428241, P02428242). (Figs. 1 & 2)

Caesalpinia mollis (Kunth) Spreng., Syst. Veg. 4, 2: 169 (1827).

Brasilettia mollis (Kunth) Britton & Killip, Ann. New York Acad. Sci. 35: 189 (1936).

Moldenhawera mollis Benth. Fl. Bras. 15(2): 77 (1870). Type:—Venezuela, Fendler 1864 (holotype K![K000264570]; isotype K![K000264571]).

Caesalpinia acutifolia J.R. Johnston, Proc. Amer. Acad. Arts 40: 686 (1905). Type:—Venezuela, El Valle, Isla Margarita, *J.R. Johnston 33* (holotype GH; isotype K!).

Distribution:—México (Campeche, Chiapas, Quintana Roo, Veracruz, Yucatán), Guatemala, El Salvador, Honduras, Nicaragua, Colombia and Venezuela.

Habitat:—Seasonally dry tropical forest along the coast, on sandy soil.

Selected specimens:—COLOMBIA. El Cerrajón, botadero, La Estrella, 22 July 2010, *D. Molina et al. 2309* (HUA); Zona de estudio El Cerrajón, 17 November 2009, *P. Trujillo et al. 4387* (HUA); Región del futuro Nueva Población, al este de Pozo Hondo, 28 February 1980, *R. Fonnegra 1410* (HUA). Santa Martha near Matatoca, 23 September 1898–1899, *H.H. Smith 705* (NY); El Cerrajón road from La Granja to Yaguaro off the main road from Barranca to Fonseca; 8 July 1980; *P. Bunch s.n.* (NY); Barranquilla Santa Rosa, 12–19 November 1932, *A. Dugand G. 234* (F 685462). VENEZUELA. Guanta, 1 July 1917, *H.M. Curran & M. Haman 1210* (F 1574419, NY); Mérida, Isla Margarita, San Francisco de Macaira, August 1955; *Bernardi 2403* (NY); El Valle, Isla Margarita, 3 August 1903, *J.R. Johnston 33* (F 174465, NY) type of *C. acutifolia*; Merida, Isla Margarita, El Valle, 15 August 1901, *O.O. Miller & J.O. Johnston 200* (F 126779, NY); Lara El Tocuyo La Cantera, August 1937, *Tamayo 264* (NY); Entre El Sombrero y Pariaguán vía Ciudad Bolívar, June 1961, *L. Aristeguieta 4684* (F 1847651, 1847649); Puerto La Cruz Ansoátegui, campamento Guaraguao, 29 June 1941, *H. Pittier 14920* (US 1876676); Lara entre La Piedad y Sarare, April 1930, *J. Sauer 394* (F 694182); Sucre Península de Paria ensenada de Patao, 24 June 1962, *J.A. Steyermark & G. Agostini 91314* (US 2450308); Libertador, entre Chichiriviche y Urica, 11 October 1976, *J. Steyermark & V.C. Espinosa 112761* (US 2450308). EL SALVADOR. Km 106 carretera Santa Ana a Metapán, 21 August 2004, *J.L. Linares 7912* (MEXU 1175789). HONDURAS. Camayagua San Ignacio cementerio del caserío El Pedernal, 12 December 1996; *J.L. Linares 4143* (MEXU 1059279). NICARAGUA. Granada 3 km al Este de Casa de Tejas camino a Charco Muerto, 5 June 1980,



FIGURE 1. *Coulteria mollis* showing many of the important features of the genus. **A.** part of a bipinnate leaf; **B** bark detail; **C** racemose inflorescence; **D** flower lateral view; **E** calyx opened out, inner surface, with lower cucullate sepal reflexed; **F** detail of the glandular-pectinate margin of the lower cucullate sepal; **G** median petal; **H** upper lateral petal; **I** lower lateral petal; **J** stamen of a male flower; **K** laterally compressed fruit; **L** seed; **M** seedling, first leaf pinnate, subsequent leaves bipinnate. **A & J** from Lewis & Hughes 1714; **B, C, E–K, L & M** from Lewis & Hughes 1713; **D** from photo of *C.E. Hughes* 324. Drawn by Eleanor Catherine.

M. Araquistain & P. Moreno 2830 (MEXU 678535); Matagalpa, SW slopes of cerro El Pílon and laguna Tecomapa, 20 July 1978, *W.D. Stevens 9455* (MEXU 363004); Carazo Río Grande camino a la Hacienda La Rosa, 12 June 1983, *A. Grijalva 2649* (MEXU 931226). GUATEMALA. El Peten, Lake Yaxha, 18 Jun 1973, *A. Gentry 8285* (NY); El Petén, 21 April 1931, *H.H. Bartlett 12678* (NY); Chiquimula límite con Mazapa, 14 November 1986, *E. Martínez S & D.M. Kaerns 19216* (MEXU 526186); El Progreso cementerio del poblado de El Rancho, 6 January 1983, *C.E. Hughes 255* (MEXU 346184); Progreso Creca de El Rancho, 4 March 1992, *C.E. Hughes et al. 1702* (MEXU 580054); Zacapa Motagua Valley 1 km W of San José de Zacapa, 12 February 1988, *G.P. Lewis & C.E. Hughes 1713* (MEXU 506685). MÉXICO. Campeche: 7.5 km del cruce de Río Lagartos rumbo a Las Coloradas, 1 July 1999, *R. Durán et al. 3379* (MO); A 4 km al N de Zoh-Laguna, camino a La Nueva Vida, 30 April 1997, *E. Martínez-Salas et al. 27079* (MO); Solidaridad, 3 km al S de Akumal, 6 July 1990, *P. Sima Polanco 1266* (MO). Quintana Roo: 5 km al N de Xel-Há, 1 September 1979, *R. Grether & E. Quero 1328* (MEXU 245045); 6 km al N de Xel-Há, 3 September 1980, *O. Téllez & E. Cabrera 3291* (MEXU 277017); 23 km al N de Cobá, 11 June 1980, *O. Téllez & E. Cabrera 2524* (MEXU 278640); Xel-Há, August 1983, *S. Escalante 133* (MEXU 399486); Solidaridad X'cacel-X'cacelito, 13 km al N de Tulum, 15 June 1989, *C. Gallardo et al. 2245* (MEXU 936336).



FIGURE 2. **A** Inflorescence and **B** Infructescence of *Coulteria mollis* (*Lewis & Hughes 1713* and *1714* respectively) collected in Guatemala, 12 February 1989. Photos: G.P. Lewis.

Coulteria platyloba (S. Watson) N. Zamora, in *Monogr. Syst. Bot. Missouri Bot. Gard.* 119: 485 (2010)

Caesalpinia (?) *platyloba* S. Watson, *Proc. Am. Acad.* 21: 425 (1886). Type:—México, Chihuahua, *E. Palmer* s.n. (1885), (holotype GH!, photos FCME!, K!; isotypes F, K!, MEXU!, NY, photos FCME!, K!).

Brasilettia platyloba (S. Watson) Britton & Rose, in *N. Amer. Fl.* 23(5): 321 (1930).

Brasilettia blasiana (M.E. Jones) Britton in *N. Amer. Fl.* 23(5): 321. (1930).

Caesalpinia blasiana M.E. Jones, *Contrib. West. Bot.* 15: 141 (1929). Type:—México, Sinaloa, San Blas, *M.E. Jones 22987* (holotype NY, photo K!, isotypes GH, RM, RS, TEX).

Brasilettia pilosa Britton & Rose, in *N. Amer. Fl.* 23(5): 322 (1930). Type:—México, Sinaloa, *E. Palmer 1682* (holotype NY, photo K!; isotype F).

Brasilettia pubescens Britton, in N. Amer. Fl. 23(5): 322 (1930). Type:—México, Sinaloa, vicinity of Guadalupe, *Rose, Standley & Russell* 14763 (holotype NY, photo K!).

Distribution:—México on the Pacific coast and in foothills of Sierra Madre Occidental and Sierra Madre del Sur from Chihuahua to Guerrero.

Habitat:—Hillsides, dry wooded slopes including thorn forest, and tropical deciduous forest; in the Pacific lowlands.

Selected specimens:—MÉXICO. Sonora: San Javier, 6.6 km west of Río Yaqui on Méx. [16° 28'33.37"N, 109° 36'04"W], 20 September 1997, *A.L. Reina et al.* 97-931 (MEXU 860975); Near Tres Mariás, road from Navojoa-Álamos, 5 November 1939, *H.S. Gentry* 4876 (MEXU 788017); Microwave hill east of Navojoa, 8 June 1983, *B. Perrill* 5423 (MEXU 393451); Al Sur de Cajeme, 21 February 1959, *F. Miranda* 8959 (MEXU 91315); Cerros del Fuerte, ca. 15 miles NO of Los Mochis, 8 September 1974, *H.S. Gentry & McClure* 23443 (MEXU 359938); Navojoa, Cerro Prieto 15 km, al NE de Navojoa hacia Álamos, 1 October 1983, *P. Tenorio L. et al.* 4640 (MEXU, 749536); Álamos, 5.2 mi NE of La Higuera between Álamos and San Bernardo, 27 August 1985, *M. Luckow et al.* 2816 (MEXU 417422); Between Navajoa and Álamos, 5 December 1968, *V. E. Rudd et al.* 2091 (MEXU 151606); San Bernardo Río Mayo, 12 July 1935, *H.S. Gentry* 1482 (MEXU 3559, 787818); 1.5 km al sur del retorno a Nuri; [28° 5'47"N 109° 19'25"W], 22 July 2005, *A.L. Reina G. & T.R. Van Devender* 2005-1099 (MEXU 1193521). Chihuahua: Batopilas, between La Bufa and Quirare, 3 July 1977, *R. Bye* 7524 (MEXU 272734); Batopilas, between La Bufa and Arroyo Basaseachi, 31 May 1980, *R. Bye* 9710 (MEXU 321410); Batopilas, on La Bufa-Quirare road, base of Buenos Aires falls, 30 July 1977, *R. Bye* 7555 (MEXU 256818); Batopilas, 19 September 1957, *I. Knobloch* 540 (MEXU 57456); Batopilas, Arroyo Guimivo, between Batopilas and Guimivo, 24 March 1979, *R. Bye et al.* 9222 (MEXU 720429); Batopilas, S side of Barranca Batopilas, N of La Bufa, 10 October 1991, *R. Bye et al.* 18293 (MEXU 837312, 827313); Batopilas, Arroyo Guimivo between La Bufa y Batopilas, 16 August 1971, *R. Bye* 1896 (MEXU 837222); Batopilas ca. 2.45 km E of Batopilas, 12 September 1994, *R. Bye et al.* 19234 (MEXU 837363); Batopilas, La Cueva Larga 4 km al Noreste de Batopilas, 16 September 1983, *P. Tenorio L. & R. Torres C.* 4442 (MEXU 749537); Batopilas, La Bufa, 18 July 1984, *P. Tenorio L. & C. Romero de T.* 6614 (MEXU 749535); Batopilas, November 1980, *Fierros* 920 (MEXU 112553). Sinaloa: Angostura Tachillere, without data, *J. González Ortega* 1030 (MEXU); El Fuerte, without data, *Fierro-Velarde* 85 (MEXU 1125120); El Fuerte, Ejido Macoyahui, 14 September 1985, *J.A. Beltrán M. et al.* 644 (MEXU 499512); Imala, 29 November 1939, *H.S. Gentry* 5101 (MEXU 787774). Guerrero: Municipio de la Unión; Camino La Margarita a las Trancas, *M.G. Campos* 22190 (FCME); 3 km al E de la Unión, *J.L. Contreras* 2753; Municipio de José Azueta. Isla Ixtapa, al O de Zihuatanejo, *M. Sousa* 6163 (MEXU); Municipio de Acapulco de Juárez. Puerto Márquez, 5 January 1944, *F. Chiang* 777 et al. (MEXU), *F.A. Barkley* 14 M141 (MO); Tepecoacuilco, 18 October 1977, *M. Ladd O., J.C. Soto Núñez & C.H. Ramos* 88 (MEXU, MO).

Coulteria pringlei (Britton & Rose) J.L. Contreras, S. Sotuyo & G.P. Lewis.

Brasilettia pringlei Britton & Rose, in N. Amer. Fl. 23(5): 322 (1930). Type:—México, San Luis Potosí, Las Palmas, *C. G. Pringle* 6356. (lectotype US 304075, designated here; isolectotypes K!, MO, photo K!, NDG, NY, photo K!, P).

No material bearing a type label annotated by Britton and Rose has been found. The original material housed in the US Herbarium consists of two specimens from the type locality. The specimen bearing US catalogue number 304075 is here designated as the lectotype, with isolectotype fragments known to exist in five herbaria.

Caesalpinia pringlei (Britton & Rose) Standl., in Trop. Woods 34: 40 (1933).

Distribution:—México: Hidalgo, Querétaro and San Luis Potosí.

Habitat:—Seasonally dry forest with columnar cacti on limestone hills.

Selected specimens:—MÉXICO. San Luis Potosí: El Abra, 10 km al E de Cd. Valles. 17 June 1956, *J. Rzedowski* 7771 (MEXU 94639). Tamaulipas: Los Coyotes, 14 February 1939, *H. Le Sueur* 202 (US 1929783, F 1000919), Sierra de San Carlos, Cañón N of San Nicolás, 15 August 1930, *H.H. Bartlett* 10964 (F 704799); 4 km al E de Rivereño, 25 December 1964, *F.G. Medrano* 975 (F 1743757); Rancho los Alacranes, 20 km al E de Casas, 1 September 1968, *F.G. Medrano & A. Gómez P.* 1816 (MEXU 288514); 30 km al N.E. de Soto la Marina, December 1964, *F.G. Medrano* 1012 (MEXU 127768); 40 km al S.E. de San Fernando, December 1964, *F.G. Medrano* 795 (MEXU 127801); Entre San Nicolás y Rancho El Lantrisco, 2 March 1970, *F.G. Medrano & V.M. Toledo* 2798 (MEXU 312461); Abasolo, Ejido Morales, 25 January 1985, *L. Hernández* 1389 (MEXU 419105); 11 mi N of Soto la Marina on the road to Jiménez,

12 December 1959, *M.C. Johnston & J. Crutchfield* 4985 (MEXU 987912); 9 km al O del rancho el Lucero, 12 March 1985, *P. Hiriart, et al.* 622 (MEXU 485065). Hidalgo: Eloxochitlán, Camino Almolón-San Juan Ajamac, [20° 43'16"N, 98° 56'38"O], 14 October 2000, *A.G. Miranda M. & E. Guizar N.* 1007 (MEXU 1001334); Cardonal, Barranca Tolantongo, 2 May 1980, *P. Hiriart et al.* 103 (MEXU 298234). Querétaro: Jalpan, N de las Flores, camino a San Antonio Tancoyol, 31 May 1989, *E. Carranza* 1763 (MEXU 1125126); Jalpan, 3 km al N de Ayutla [21° 24'N, 99° 35'O], 6 August 1992, *I. Trejo* 2379 (MEXU 1087021); Arroyo Seco, 12 km al SW del Trapiche, 29 April 1982, *P. Tenorio L y R. Hernández M.* 296 (MEXU, SR); San Joaquín, Cañada La Culebra, 1 km al NE de La Tinaja, 27 August 1978, *S. Zamudio* 3217 (MEXU 983694); San Joaquín Cañada La Culebra, 1 km al NE de La Tinaja, 18 November 1978, *S. Zamudio* 3547 (MEXU 917237); Jalpan, 7 km al S.E. de Tancoyol, 10 June 1986, *R. Fernández Nava* 3484 (MEXU 696379); 4 km al S de Arroyo Seco, carretera a Jalpan, 4 July 1992, *J. Rzedowski* 51499 (MEXU 615045); Arroyo Seco, 2 km al S de Ayutla, 1 July 1985, *R. Fernández Nava* 2956 (MEXU 412295); San Joaquín, 5 km al NE de La Tinaja, 20 October 1994, *S. Zamudio y E. Pérez C.* 9409 (MEXU 753203); Landa 4.5 km al S de Landa, 7 July 1998, *A. Herrera* 249 (MEXU 753325); San Joaquín, El Platano, Rives et alentours du río Estorax [20° 58'N, 99° 37'W], 3 October 1994, *J.-N. Labat & E. Carranza González* 2592 (MEXU 629639); Landa, 1km al Sur de Puerto Blanco, 13 February 1988, *A. Herrera* 111 (MEXU 718215); Arroyo Seco, El Arroyo de la Cuesta de los Santos, 29 April 1982, *P. Tenorio y R. Hernández* 303 (MEXU 300407, 340280); Jalpan, Al NE de Tanchanaquito, 30 April 1996, *L. López Ch.* 577 (MEXU 717613).

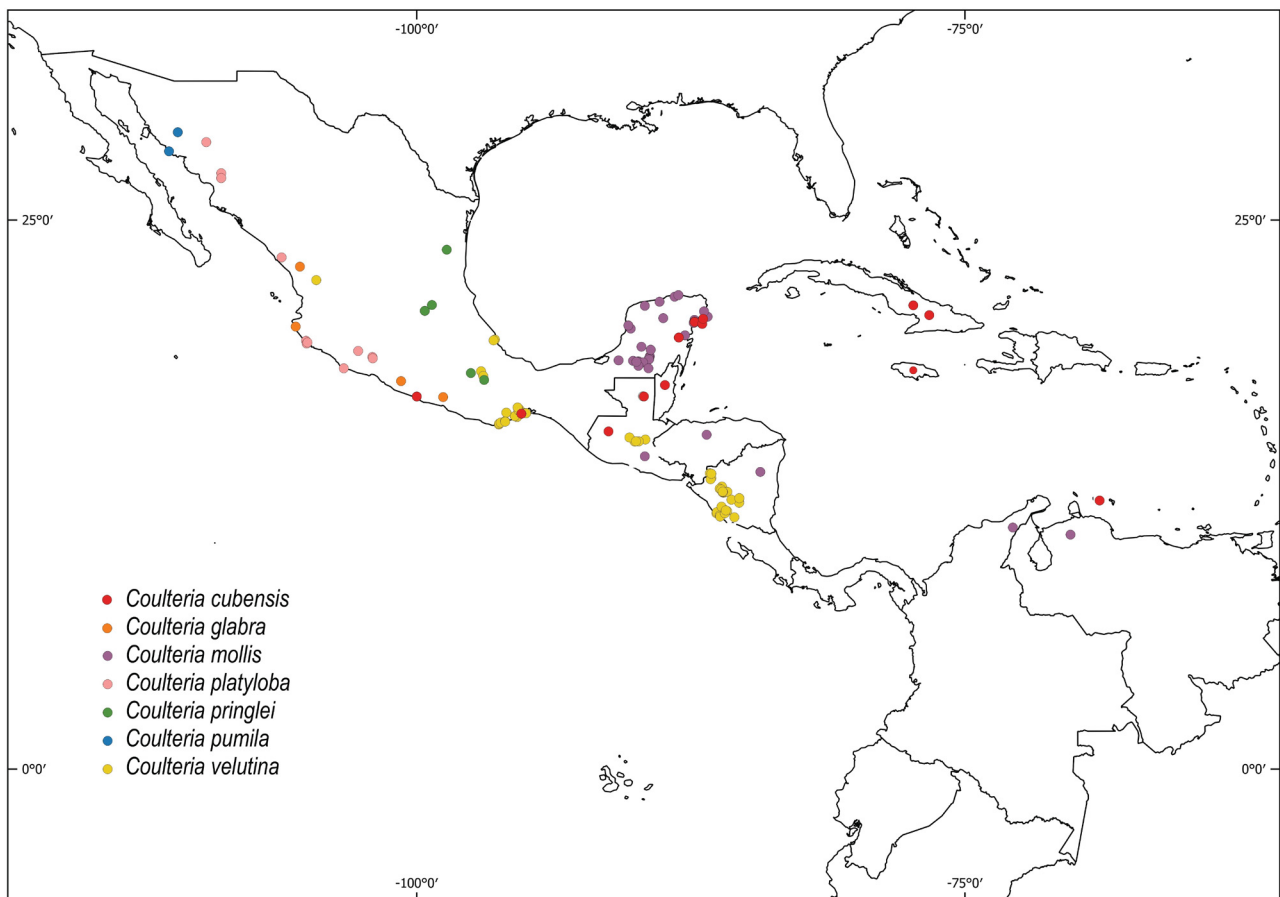


FIGURE 3. Distribution map of *Coulteria* species. Based only on GBIF georeferenced data. The identifications of all specimens plotted on the map have been checked by the first two authors.

Coulteria pumila* (Britton & Rose) S. Sotuyo & G.P. Lewis, *comb. nov.

Guaymasia pumila Britton & Rose, in *N. Amer. Fl.* 23(5): 322 (1930). Type:—México, Sonora Alta, without collector or number, although *Caesalpinia gracilis* Benth. ex Hemsl. was given as a synonym (see below).

Caesalpinia pumila (Britton & Rose) F.J. Herm., in *J. Wash. Acad. Sci.* 38(7): 237 (1948).

Caesalpinia gracilis Benth. ex Hemsl., in *Diagn. Pl. Nov. Mexic.* 1: 9 (1878), non Miquel (1855). Type:—*Coulter* 485 (holotype K!), *Coulter s.n.* (presumed isotype K!).

Caesalpinia gracilis Benth. ex Hemsl. is an illegitimate name because it is a later homonym of *Caesalpinia gracilis* Miq. (1855); Britton & Rose proposed *Guaymasia pumila* Britton & Rose (1930) as a replacement name for *Caesalpinia gracilis* Benth. ex Hemsl. (1878), non Miq. (1855). Thus the earliest legitimately published name for the taxon carries the species epithet *pumila*.

Distribution:—México: Sonora.

Habitat:—Tropical deciduous forest, thorn scrub, desert rocky hillsides near the ocean.

Selected specimens:—MÉXICO. Sonora: 12 km al E de San Carlos, 16 July 1996, *A. Flores M. y M. Ortega M. 4526* (MEXU 855757); 7 mi E of Cachivi, [28° 50'N, 110° 22.5'W], 2 September 1988, *G. Nabham et al. 5192* (MEXU 472501); 2 km south Cañon Nacapule, 11 August 1985, *R.S. Felger & M. A. Dimmit 85-871B* (MEXU 611313); Sur de Hermosillo, 20 February 1959, *F. Miranda 8932* (MEXU 66729); New Year Mine, 20 miles SW of Hermosillo, 28 October 1926, *M.E. Jones 22433* (MEXU 457944, F 701352); 4 km al E de Guaymas road to Cd. Obregón, [27° 56' N, 110° 49' W], 27 January 1992, *G.P. Lewis et al. 2062* (K, MEXU 543647); 67 km al S de Hermosillo [28° 27' N 111° 02' W], 28 January 1992, *G.P. Lewis et al. 2066* (K, MEXU 543639); 15 km from Hermosillo on road to Sahuaripa [29° 04'N, 110° 41'W], 28 January 1992, *G.P. Lewis et al. 2067* (K, MEXU 543640); 20 km al S de Vicam carretera México-Nogales, 8 December 1986, *J.M. Aguilar, et al. 2089* (MEXU 646814); 17 mi by México hwy 15 north of junction to Bahía San Carlos, 8 September 1980, *R.S. Felger & R. Schmalzel 80-63* (MEXU 487037, 787037); Guaymas, calcareous adobe soil in valley, 24 October 1939, *H.S. Gentry 4701* (MEXU 787773); Between Hermosillo and Guaymas, 4 December 1968, *V.E. Rudd 2089* (MEXU 151601, US 2574727); 14 km on road to Alamo from Navojoa, 8 July 1971, *D. Ducote et al. 3042* (NY); Guaymas, 1887, *E. Palmer 147* (NY 49627); 20 mi S Hermosillo road to Guaymas, 1 September 1941, *I.L. Wiggins & R.C. Rollins 210* (US 1892787); Miramar, West of Guaymas, 28 July 1935, *F.W. Pennell 19444* (US 1641936).

Coulteria velutina (Britton & Rose) S. Sotuyo & G.P. Lewis, **comb. nov.**

Brasilettia velutina Britton & Rose, in *N. Amer. Fl.* 23(5): 322 (1930). Type:—Guatemala, *W.A. Kellerman 7044* (holotype US, photo FCME!; isotypes F, LL, MEXU!, US, photo MEXU!).

Caesalpinia velutina (Britton & Rose) Standl., in *Trop. Woods* 34: 40 (1933).

Distribution:—México, from Jalisco to Chiapas (Guerrero, Jalisco, Michoacán, Oaxaca, Chiapas, and Veracruz) and from Guatemala to Nicaragua, along the Pacific coast.

Habitat:—Thorn scrub, seasonally dry tropical forest.

Selected specimens:—GUATEMALA. Zacapa at West of La Fragua, 9 May 1985, *C.E. Hughes 710* (MEXU 403755); Jalapa, El Rancho, 6 January 1906, *W.A. Kellerman 5718* (MEXU 49455); Retalhuleu San Felipe, 4 February 1906, *W.A. Kellerman 5566* (MEXU); W of the Fragua, 2.5 km S of Río Magdalena, 14 February 1993, *J.A. Hawkins & C.E. Hughes 16* (MEXU 594187); Baja Verapaz at W of Salamá Puente Barranca, 24 July 1988; *P. Tenorio et al. 14748* (MEXU 526187, 749605, 654918); Zacapa [14° 90'N, 89° 60'W], 14 February 1993, *J.A. Hawkins & C.E. Hughes 15* (MEXU 595199); Huehuetenango, above Democracia to Jutal, 23 August 1942, *J. A. Steyermark 51065* (F 1196996); Chiquimula on road from Zacapa, 9 October 1940, *P.C. Standley 73749* (F 1091208); Zacapa near La Fragua, 14 October 1940, *P.C. Standley 74788* (F 1191310); Chontales Puente Buenos Aires, 12 June 1982, *W.D. Stevens et al. 21565* (NY). MÉXICO. Veracruz: Zempoala, Tierra Caliente camino Zempoala Actopan, 29 April 1976, *C. Hernández Aponte et al. 242* (F 1931784). Oaxaca: Puerto Angel, 12 April 1933, *C.V. Morton & E. Makrinius 2609* (F 823499, US 1585601, 1585602); Playa de San Agustín en Mar Pacífico, 1841–1843, *Liebmman 5059* (F 662708); 1841–1843, *Liebmman 4516* (F 662247); Puerto de Santa Cruz, October 1842, *Liebmman 5057* (F 662248); Estación Almoloyas Cañon del Tomellín; 29 September 1907, *C. Conzatti 2043* (F 225811); 8 km al NE de Teotitlán del Camino hacia Huautla, 17 February 1976, *M. Sousa Sánchez et al. 5400* (US 2790752); Tehuantepec Paso Alicia Guingola, 6 April 1969, *T. MacDougall s.n.* (NY). Guerrero: 5.5 km de Cieneguillas, 27 May 1976, *A. Delgado S. et al. 130* (US 2790132); La Unión El Pantano, *E. Langlasse 252* (MEXU). Michoacán: Apatzingán 15 km al SW Rancho el Capire, 2 August 1940, *W.M.C. Leavenworth 424* (F 1076130).

Excluded names

Coulteria horrida Kunth = *Tara spinosa* (Molina) Britton & Rose

Coulteria africana Guill. & Perr. = *Prosopis africana* Taub.

Coulleria chilensis DC. = *Tara spinosa* (Molina) Britton & Rose
Coulleria mexicana DC. = *Tara vesicaria* (L.) Molinari, Sánchez Och. & Mayta
Coulleria tinctoria Kunth = *Tara spinosa* (Molina) Britton & Rose

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