NEW TAXA IN *XIMENIA* (Olacaceae)

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ABSTRACT. — *Ximenia americana* Linnaeus var. *argentinensis* of Argentina, Paraguay and Bolivia and *Ximenia parviflora* Bentham var. *glauca* of Mexico are newly described. *Ximenia coriacea* Engler var. *intermedia* Chodat & Hassler, of Paraguay and Brazil, is elevated to species rank. The new varieties are illustrated.

Ximenia, a member of the arborescent dicotyledonous family Olacaceae, is composed of eight species (totaling twelve taxa) of tropical and subtropical, thorny root-parasites. The two new varieties and one new combination proposed below are the result of a study of specimens from thirty-eight herbaria (DeFilipps, 1968).

Infraspecific categories in *Ximenia* are customarily ranked as varieties, rather than subspecies, and this precedent is followed herein. All collections cited below have been examined by the writer; herbarium abbreviations are those of Lanjouw & Stafleu (1964).

The most widespread species in the genus is *Ximenia americana* Linnaeus, which has differentiated into three well-marked varieties. The typical element of this species, var. *americana,* is found in Florida (where it is known as tallow wood or hog plum), the West Indies, Mexico, Central and South America. In the Old World it is distributed in India, Cambodia, China, numerous island groups throughout the Pacific Ocean, and on the west coast and inland areas of Africa. In Africa this species is also represented by var. *microphylla* Welwitsch ex Oliver, which is restricted to the south-central part of the continent. Variety *microphylla* has glaucous, generally smaller leaves and usually more pronounced thorns than in var. *americana,* perhaps a reflection of the more xeric environmental conditions under which it grows. Examination of South American collections of this species has shown that a previously unrecognized variety occurs in Argentina, Paraguay and Bolivia. This taxon has glaucous, smaller leaves and is very thorny, as in its African counterpart (var. *microphylla*), and also possibly may have originally retained these characters in order to successfully occupy a drier habitat than var. *americana.*

This new element, described below as var. *argentinensis,* is separable from the other varieties as follows:

1. Leaves not glaucous; inflorescence an umbel, subumbel or cyme; sepals ciliate .... var. *americana*

1. Leaves predominantly glaucous; inflorescence a subumbel, or flowers solitary; sepals ciliate or eciliate.
   2. Petals 4.5-6.0 mm long; sepals ciliate or eciliate; style to 1.3

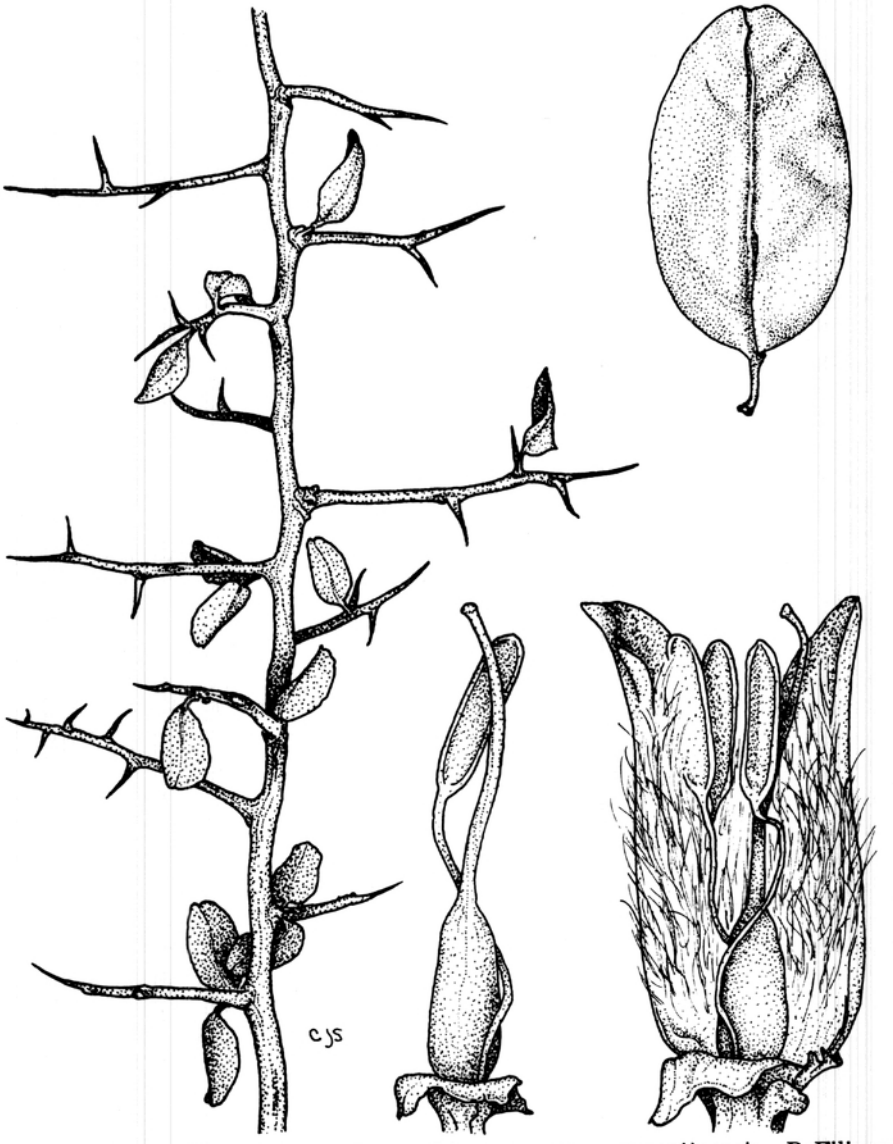

FIGURE 1. *Ximenia americana* Linnaeus var. *argentinensis* DeFilipps. Branch: XI, *Cocucci, DiFulvio & Artico 370* (SIU). Leaf: X4, *Cocucci, DiFulvio & Artico 370* (SIU). Flowers: X7, *Hunziker 8504* (SIU). Drawn by C. Seliger.

mm long ....var. *microphylla*

2. Petals 6.4-11.0 mm long; sepals eciliate; style 4.2-7.0 mm long .....var. *argentinensis*

1. *Ximenia americana* Linnaeus var. *argentinensis* DeFilipps, var. nov. (Figure 1).

Glabri saepe glauci arbores vel frutices; inflorescentiae subumbellae

vel flores solitarii; sepala eciliata, petala (6.4-) 7.0-11.0 mm longa; styli (4.2-) 4.5-7.0 mm longi; differt a varietate americana et varietate microphylla longis stylis.

Glabrous, predominantly glaucous shrubs or trees 1-8 m; thorns to 5 cm long; lamine elliptic or orbiculate, retuse or obtuse, emucronulate or mucronulate, 1.3-3.0 (-4.1) cm long, 0.8-1.6 (-3.0) cm wide, membranous, often glaucous, petioles 2-4 (-6) mm long; inflorescences subumbels of 2-3 flowers, or flowers solitary, peduncles to 8 mm long, pedicels to 8 mm long, 2-bracteolate at 3 mm from base when solitary, or ebracteolate; flowers functionally bisexual, sepals (3-) 4 (-5), 1-2 (-4) mm long, eciliate, petals 4 (-5), (6.4-) 7-11 mm long, inner surfaces white-bearded to within 2 mm of apex, white or whitish-yellow; stamens 8, filaments 3.5-4.5 (-6.0) mm long, anthers (3.2-) 4.0-4.5 mm long; ovary lanceoloid, 2.5-3.0 (-4.0) mm long, style (4.2-) 4.5-7.0 mm long; drupe broadly ellipsoid, 1.6-2.3 cm long, 1.1-2.0 cm in diameter; seed ellipsoid, 1.4 cm long, 1 cm in diameter.

TYPE: ARGENTINA: Catamarca: Andalgala: Andalgala, 1910. *Jorgensen 1140.* (HOLOTYPE: US 921775; ISOTYPES: GH, MO, UC).

This variety occurs in monte vegetation in lowlands and mountainous areas in Argentina and in the Chaco of Paraguay and Bolivia. In Argentina the plants are locally called "pata" (*Luna 350; Venturi 282, 7208; Schreiter 4460*) or "albaricoque de campo" (*Hicken s.n.*).

Additional specimens examined: *ARGENTINA*: BUENOS AIRES: Without locality, *Bacle s.n.* (G). CATAMARCA: El Alto: Balcogna, *Venturi 7208* (F), La Paz: Palo Cruz las Cefas, *Brizuela 396* (LIL), San Lorenzo, *Brizuela 94* (LIL), San Jose, *Brizuela 45* (LIL). CORDOBA: Cordoba, *Stuckert 3759* (G), Punilla: Los Cocos, *Stuckert 19628* (G), Sobremonte: Cerro Colorado, *Hunziker 8504* (SIU), Tulumba: Dean Funes a Sauce Punco, *Meyer 13237* (LIL). CORRIENTES: Empedrado: Arroyo Peguaho, *Pedersen 1182* (BR, S, U, US). ENTRE RIOS: Parana: La Toma, *Burkart, Troncoso & Bacigalupo 23645* (SI). JUJUY: Jujuy: 40 km S of Jujuy, *Eyerdam & Beetle 22430* (G,GH,UC), San Pedro: San Pedro de Jujuy, *Venturi 10537* (SI). LA RIOJA: General Belgrano: Olta, *Cocucci, DiFulvio & Artico 370* (SIU), General Roca: Chepu, *Cuezzo 993* (S), Independencia: Guayapas, *Hayward & Legname 3203* (LIL). MENDOZA: Maipu: Rio Mendoza, *Bartlett 19367* (GH,SI, US). SALTA: Anta: 5 km from Apolinario Saravia, *Morello, Legname & Cuezzo 905* (LIL), Campo Santo: Yaquiasme, *Meyer s.n.* (LIL), Chicoana: El Carril, *Burkart 17576* (SI), La Candelaria: Unquillo, *Schreiter 6640* (LIL,U), Oran: Rio Pedros, *Rodriguez 1105* (SI). SAN JUAN: Ullun: Rio San Juan, *Rodrigo 2820* (LIL). SAN LUIS: *Hicken s.n.* (SI). SANTA FE: Malabrigo, *Parodi 11267* (F,GH). SANTIAGO DEL ESTERO: Copo: Matoque, *Luna 338* (BR,LIL), Jiminez: El Charco, *Schreiter 5949* (U), *Venturi 9696* (A,MO,US), La Banda: Desmonte, *Luna 1282* (LIL), Ojo de Agua: Ojo de Agua, *Baleguo 1378* (LIL), Pellegrini: Algarrobal Viejo, *Luna 350* (LIL), El Tigre, *Luna 18* (LIL,

MO), Sarmiento: Garza, *Huidobro 3098* (LIL). TUCUMAN: Burruyacu: Burruyacu, *Stuckert 9295* (G), Trancas: Vipos, *Vervoorst 3350* (LIL), Tapia, *Venturi 1058* (US).

PARAGUAY: Alto Paraguay, Chaco, *Fiebrig 1360* (G,S,Z), Gran Chaco, Loma Clavel, *Hassler 2568* (BM,G).

BOLIVIA: Santa Cruz: Boyuibe, *Troll 436* (B).

2. *Ximenia parviflora* Bentham var. *glauca* DeFilipps, var. nov. (Figure 2).

   Differt haec varietate a varietate parviflora glaucis caulibus et foliis, foliis obovatis vel orbiculatis.

Glaucous, glabrous or puberulent, divaricately branched shrubs 0.5-2.5 m; thorns to 1.5 cm long; laminae obovate or orbiculate, retuse or obtuse, emucronulate or with mucro to 0.4 mm long, 1.2-2.0 cm long, 0.9-1.5 cm wide, subcoriaceous, glabrous or puberulent, petioles 2.5-4.0 mm long; inflorescences subumbels of 2-3 flowers, or flowers solitary, peduncles 1.5 mm long, pedicels of solitary flowers 3.5-7.5 mm long, 2-4-bracteolate at 0.5-2.0 mm from base; flowers functionally bisexual or unisexual, sepals 4, 1 mm long, sparsely ciliate, petals 4, 5.5-6.0 mm long, inner surfaces white-bearded to within 1.5-2.0 mm of apex, maroon; stamens 8, filaments 1.8-3.0 mm long, anthers 1.8-2.8 mm long; functional ovary lanceoloid, (2.2-) 2.6-3.0 mm long, style (0.3-) 0.5-1.5 mm long; ovary of functionally male flowers lanceoloid, 2.0-2.5 mm long, style absent; drupe globoid, 1.3 cm long, 1.1 cm in diameter; seed globoid, 1.3 cm long, 1.1 cm in diameter.

TYPE: MEXICO: Baja California Sur: Sierra de la Giganta, arroyo in the vicinity of Rancho Naucajoa, W of Llanos de San Juan, with *Olneya tesota, Cercidium microphyllum, Lysiloma candida, Bursera epinnata, Lemaireocereus thurberi,* and *Pachycereus pringlei,* altitude ca. 120-200m, May 31, 1963. *Carter & Reese 4534.* (HOLOTYPE: UC; ISOTYPE: SIU).

Ximenia parviflora var. *parviflora,* the typical element of this species, occurs on mainland Mexico in the States of Chiapas, Guanajuato, Hidalgo, Jalisco, Michoacan, Nayarit, San Luis Potosi and Sinaloa. It is characterized by elliptic, oblong or spatulate leaves which are not glaucous. In contrast to this, the stems and leaves of var. *glauca* are conspicuously glaucous, and the leaves are obovate or orbiculate. These features, in addition to its geographical confinement to the peninsula of Baja California, serve to separate var. *glauca* from the mainland variety.

Variety *glauca* appears to be limited to the inland northeastern flanks of the Sierra de la Giganta (essentially glabrous specimens) and the adjacent coastal arroyos of the Gulf of California (densely puberulent specimens, as *Carter & Ferris 4702* and *Johnston 3718*). When present, pubescence is usually confined to stems and leaves, however *Johnston 3718* has densely puberulent stems, leaves, petioles, pedicels and calyces. This condition suggests a relationship to *Ximenia pubescens* Standley, an incompletely-known species of Oaxaca, Mexico, although the latter has non-glaucous foliage and the

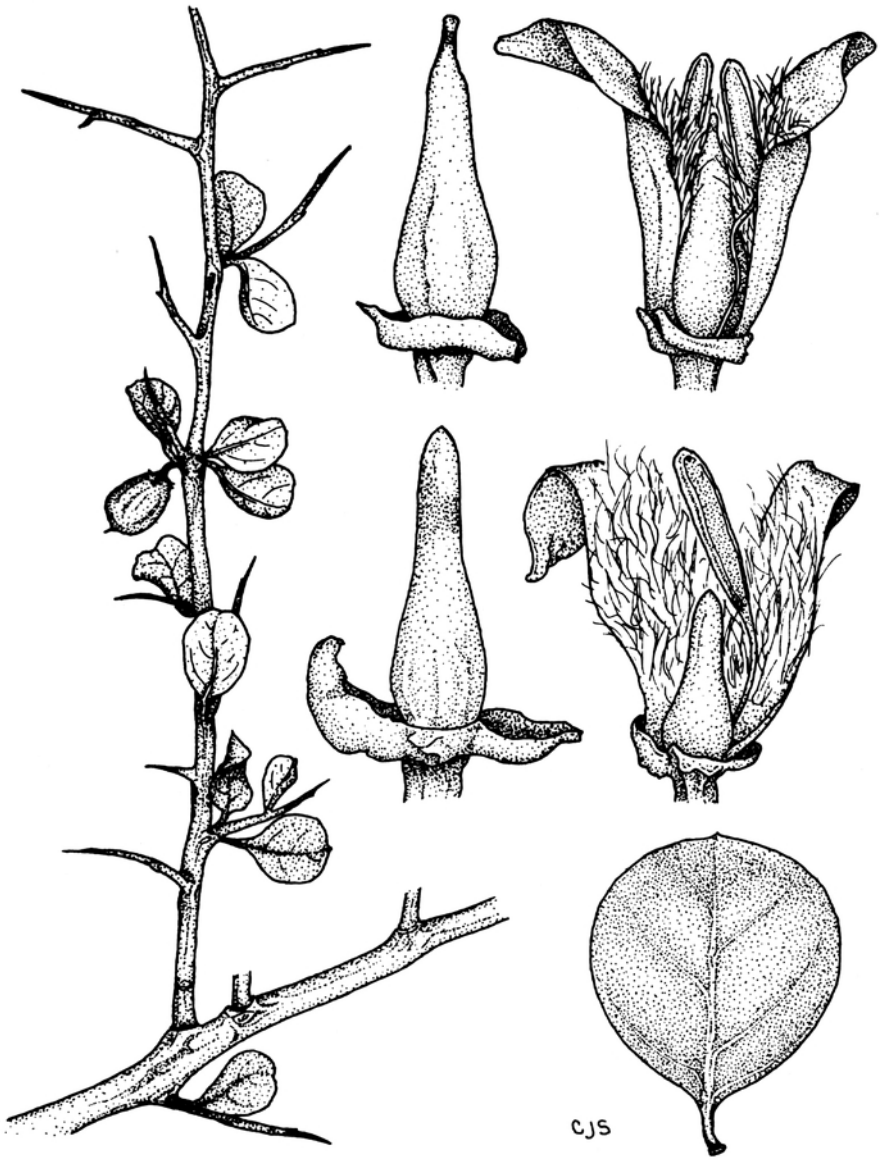

FIGURE 2. *Ximenia parviflora* Bentham var. *glauca* DeFilipps. Branch: X1, *Carter & Reese 4532* (SIU). Leaf: X2, *Carter & Reese 4532* (SIU). Functionally bisexual flowers at upper right: flower (at right) X8, pistil (at left) X12, *Carter & Reese 4534* (SIU, isotype). Functionally male flowers at center right: flower (at right) X10, pistil (at left) X16, *Carter & Reese 4532* (SIU). Drawn by C. Seliger.

exterior surfaces of the petals are also puberulent.

The local name recorded for var. *glauca* is "bachata" (*Carter 4469*).

Additional specimens examined:

MEXICO: Baja California Sur: Sierra de la Giganta, Cuesta de Naucajoa, W of Llanos de San Juan, *Carter & Reese 4532* (SIU,UC), *Carter 4469* (UC), Arroyo de Gua, NW of Loreto, *Carter & Ferris 3973* (UC), Mouth of arroyo entering Gulf S of Punta San Basilio, *Carter & Ferris 4702* (UC), San Nicholas Bay, *Johnston 3718* (CAS 84631, UC).

3. *Ximenia intermedia* (Chodat & Hassler) DeFilipps, comb. nov. and stat. nov.

Ximenia coriacea Engler var. *intermedia* Chodat & Hassler, Bull. Herb. Boiss. Ser. 2. 4: 64. 1903.

Shrubs 1-4 m; thorns 1.2-2.3 cm long; laminae elliptic to ovate, obtuse or retuse, with mucro to 0.5 mm long, 3.2-5.5 cm long, 1.9-2.6 (-3.6) cm wide, membranous to coriaceous, glabrous, petioles 3.0-4.5 mm long, glabrous to puberulent; inflorescences subumbels or umbels of 2-4 flowers, peduncles 1.5-4.5 mm long, puberulent, pedicels 2-3 mm long, glabrous to puberulent; flowers functionally bisexual, sepals 4 (-5), 0.3-0.6 mm long, glabrous to puberulent, ciliate at apex, petals 4 (-5), 4.5-6.0 mm long, inner surfaces white-bearded to within 0.5-2.0 mm of apex, ciliate, white or yellow-green; stamens 8, filaments 2.0-4.2 mm long, anthers 1.7-2.5 mm long; ovary lanceoloid, 1.8-3.0 mm long, style 1.4-1.5 (-2.0) mm long; drupe ellipsoid, 1.5 cm long, 1.3 cm in diameter, seed 1.2-1.3 cm long, 0.9-1.0 cm in diameter.

TYPE: PARAGUAY: In regione cursus superioris fluminis Apa, Jan. 1901-1902. *Hassler 8408*. (HOLOTYPE: G; ISOTYPES: A,BM,F, MO,UC).

The 2- to 4-flowered inflorescences, puberulent peduncles, and often puberulent pedicels and sepals characterize this species. The short style indicates a relationship to glabrous *Ximenia coriacea* Engler of the States of Minas Gerais and Bahia, Brazil, which has solitary flowers and styles 1.5-1.7 mm long.

This species occurs in the cerrados of Paraguay and Brazil. In Brazil the plants are locally called "limão-sinho" (*Macedo 1180*).

Additional specimens examined:

PARAGUAY: Apa River, *Hassler 8404* (S), Sierra de Amambay, Esperanza, *Hassler 10613* (A,B,G), *10613a* (A,G,MICH,MO,S,SI,UC, US).

BRAZIL: MINAS GERAIS: Ituiutaba, *Macedo 1180* (S,US), *2584* (S), Without locality, *Claussen s.n.* (G). BRASILIA D.F.: *Barroro 650* (SIU). MATO GROSSO: Pantanal de Rio Negro, Fazenda São Sebastião, *Castellanos & Strang 22523* (R).

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