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THE GENUS *CNIDOSCOLUS* IN MEXICO: NEW SPECIES
AND CRITICAL NOTES*

CYRUS LONGWORTH LUNDELL

In carrying out investigations for the Rubber Development Corporation of the United States Government in Mexico in 1943 to determine the sources of chilte gum, collections of *Cnidoscopus* were made in eleven states. The areas in which material was gathered range from seashore, arid and wet lowlands, through wet temperate uplands, to desert and mountainous regions of the high plateau.

Although the genus is of considerable economic importance and abundantly represented throughout Mexico, it has received very little attention from botanical collectors. Considering the investiture of stinging hairs on the plants, those of *C. elasticus* causing persistent sores, this is readily understood. Further, the fleshy nature of the thick twigs demands artificial heating to dry satisfactory specimens. Staminate and pistillate flowers as well as mature seeds are essential for the interpretation of the species, and only by making several trips to each area during the season can such material be obtained. Most of the material in herbaria is grossly inadequate.

In this preliminary study, twelve new species are proposed, all apparently referable to the Section *Calyptrosolen* as delimited by McVaugh (1944). Along with field notes and other observations on various species, the transfer of *Jatropha Jurgensenii* Brig. and *J. Liebmannii* Muell. Arg. is made to the genus *Cnidoscopus*.

CNIDOSCOLUS ACONITIFOLIUS (Mill.) I. M. Johnst. Contr. Gray Herb. **68**: 86. 1923. *Jatropha aconitifolia* Mill. Gard. Dict. ed. 8. *Jatropha* No. 6. 1768.

MEXICO: VERA CRUZ, east of Córdoba, along roadside at base of cliff, October 5, 1943, *C. L. Lundell & Amelia A. Lundell 12530, 12530A*, shrub, 6 ft. high, pith with transverse plates, latex white, calyx greenish outside, white within.

This collection agrees closely with the description of the species by Pax (1910). However, the staminate calyx is minutely puberulent rather than glabrous, and the ovary is only sparsely pubescent at base.

In the interpretation of *C. aconitifolius* by McVaugh (1943), the outer stamens are described as 4-5 mm. long. In *Lundell & Lundell 12530*, the outer stamens do not exceed 3 mm. including the fused basal part (1 mm.) of filaments. The staminate and pistillate flowers are slightly less than 1 cm. in length. The seeds from *Lundell & Lundell 12530A* agree in detail with the illustration by McVaugh (1943, fig. 12) based upon *Rose & Rose 11474*.

C. tenuilobus, described from the Pacific lowlands, approaches *C. aconitifolius*, as herein interpreted, and represents a geographical segregate. The

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androecium of both species is very similar, differing only in the smaller size of the gland in *C. aconitifolius*. In both species the staminate calyx lobes are shorter than the tube.

Cnidoscolus albidus Lundell, sp. nov. Frutex, 1 m. altus, pilosus et dense stimulosus. Folia longe petiolata, petiolo ad 15 cm. longo; lamina late cordata, 7.5–17 cm. longa, 9.5–21 cm. lata, supra pilosa, subtus albidotomentosa, lobis 5, grosse lobulato-dentatis. Flores foeminei 9–11 mm. longi. Calyx utrinque sexus ad medium 5-lobus. Antherae biverticillatae. Ovarium pubescens.

Shrub, 1 m. high; twigs thick, densely pilose, the stinging hairs abundant, up to 5 mm. long; pith drying with transverse walls. Petioles rather stout, costate, up to 15 cm. long, densely pilose, the stinging hairs abundant; gland at apex of petiole large, fleshy, horseshoe-shaped. Leaf-blades broadly cordate, 7.5–17 cm. long, 9.5–21 cm. wide, with 5 primary lobes and veins, openly but narrowly cordate at base, upper surface dark green, densely pilose, bearing scattered stinging hairs along the primary and secondary veins, under surface white-tomentose, the stinging hairs few; the primary lobes extending below the middle of the blade, each conspicuously lobed and coarsely dentate, the secondary lobes and teeth spinescent. Inflorescence 6–15 cm. across; the peduncle 16–27 cm. long, densely pilose, the stinging hairs abundant; the primary branches of the inflorescence 2–6, forked 2–4 times, up to 5.5 cm. long, ascending, densely pilose and conspicuously armed with abundant stinging hairs, the ultimate branchlets bearing staminate flowers. Staminate flowers white; calyx finely tomentose, 15–17 mm. long, the tube slender, contracted at base into a short stipe, expanded above, obscurely costate, lobed to the middle, the lobes elliptic, spreading; staminal column pubescent at base, the stamens exserted; stamens 10 in two whorls; anthers 1.5–2 mm. long, equaling or slightly longer than the free part of filaments; staminodia 3, filiform, erect. Pistillate flowers solitary; calyx finely tomentose, deciduous in one piece, 9–11 mm. long, the tube cylindrical, the lobes oblong-elliptic, armed with a few stinging hairs; ovary finely tomentose; styles 3, dichotomously forked. Immature capsule ellipsoid, tomentose with fine short hairs, not beset with stinging hairs.

MEXICO: HIDALGO, above Jacala, off highway at kilometer 270, in scrub, August 19, 1943, *C. L. Lundell & Amelia A. Lundell 12394* (TYPE in the herbarium of Southern Methodist University).

Since the pistillate calyx is tubular at the base and deciduous as a whole, *C. albidus* is technically near *C. tubulosus* (Muell. Arg.) I. M. Johnst. As usually interpreted, *C. tubulosus* has been a nebulous entity to which most species with pistillate calyx tubular at base have been referred. Since type material is not available for examination, I am uncertain as to the application of the name. Pax (1910) described the staminate calyx of *C. tubulosus* as follows: "Calyx ♂ aperiens pyriformis, 5 mm. longus, deinde 6–8 mm. attingens, extus tomentellus." *C. elasticus*, *C. tepiquensis*, *C. spinosus*, and *C. albidus*, referable to this complex, all have the staminate calyx at least twice as large, and differ broadly in various other significant characteristics.

C. albidus is scarcely to be confused with any other Mexican species. Like *C. armatus*, it is a desert shrub of the high plateau.

Cnidoscolus armatus Lundell, sp. nov. Frutex, ad 1.5 m. altus, armatus. Folia petiolata, petiolo ad 8 cm. longo; lamina parva, rigide chartacea, ad

10.5 cm. longa, 11 cm. lata, ad basim villosa, glabrata, lobis 3 vel 5, lobulatis, remote dentatis. Inflorescentiae 3-7 cm. latae. Capsula ca. 11 mm. longa, glabrata, stimulosus. Caruncula 3-3.6 mm. lata.

Shrub, up to 1.5 m. high, the branches viciously armed with persistent rigid stinging hairs up to 1.3 cm. long; twigs stout, reddish, villous at the tips, conspicuously armed; pith with transverse plates. Petioles stout, costate, up to 8 cm. long, brown-villous along the lower side and at apex and base, the stinging hairs few; gland at apex of petiole small and fleshy, or absent. Leaf-blades small, drying stiff and chartaceous, up to 10.5 cm. long (from apex of petiole), up to 11 cm. wide, the basal sinus narrow, the primary lobes and veins 3 or 5, brown-villous at base, essentially glabrous otherwise, the stinging hairs few on both surfaces, appressed along the margin; the lobes extending at least three-fourths to base, narrowed below, the apical largest, the basal reduced and spreading, the apical and lateral usually with a prominent secondary lobe on each side at or above the middle, the margin remotely dentate with sharp teeth, the teeth gland-tipped. Inflorescence (in fruit) small, 3-7 cm. across, the peduncle stout, up to 10 cm. long, short villous-tomentose at first, glabrate, beset with stinging hairs; the primary branches 2 or 3, forked, with indument like that of peduncle. Staminate and pistillate flowers not seen. Capsules oval, about 11 mm. long (almost mature), glabrate, beset with slender stinging hairs. Seeds gray, not mottled, or with a few minute black spots chiefly along the margin, oblong-ellipsoid, somewhat flattened, about 9 mm. long (including the protruding caruncle), 5 mm. wide, slightly emarginate at base, acutish at apex; caruncle large, fleshy, protruding beyond apex of seed, 3-3.6 mm. wide, 1.6-1.9 mm. high, subtruncate and lobed at base, extending below the hilum, the fleshy lobes forming a cavity above the depressed hilum.

MEXICO: PUEBLA, off Tehuacán-Córdoba road, on dry hills east of Garci-Crespo, in desert scrub, October 5, 1943, *C. L. Lundell & Amelia A. Lundell 12525* (TYPE in the herbarium of Southern Methodist University).

In the absence of flowers, the relationship cannot be established; however, the leaf form is suggestive of *C. aconitifolius*. The species is exceptionally well-marked by the abundant long rigid stinging hairs persistent on the branches, by the gland-tipped hairs of the leaf margin, by the small seeds with protruding fleshy caruncle forming a cavity around the hilum, and by the small thick leaf blades. The villous indument usually is reddish. When present, the petiolar gland is small and fleshy.

Growing in the arid Tehuacán plateau region, the species appears to be isolated geographically.

Cnidoscolus Chaya Lundell, sp. nov. Frutex, ca. 3 m. altus, stimulosus, ceterum glaber. Folia petiolata, petiolo 12-15 cm. longo; lamina ad 15 cm. longa, 23 cm. lata, stimulosus, lobis 7, subpinnatifidis. Sepala ♂ 12 mm. longa, ad medium connata, puberula, alba. Stamina 10, biverticillata, 11 mm. longa. Capsula ca. 1 cm. longa, parce stimulosus. Caruncula ca. 1.5 mm. lata.

Arborescent shrub, scarcely 3 m. high; twigs thick, armed with scattered spine-like stinging hairs up to 4 mm. long, glabrous otherwise. Petioles stout, 12-15 cm. long, armed with short scattered stinging hairs, rather sparsely hirtellous at apex and base, otherwise glabrous, costate when dry; glands at apex of petiole suborbicular, fleshy, paired, one above the other. Leaf-blades broader than long, up to 15 cm. long (from apex of petiole), 23 cm. wide,

with deep broad basal sinus, the primary lobes and veins usually 7, with scattered short stinging hairs along the principal veins on both surfaces, pubescent at base, otherwise glabrous; lobed to within 2-3 cm. of base of blade, the lobes pinnatifid, cut at least halfway to their midribs into oblong or triangular secondary lobes as much as 6 cm. long, the apex of lobes and teeth of margin usually triangular, acute, ciliate with short appressed setae. Inflorescence small in flower, about 6 cm. across, the peduncle stout, about 24 cm. long, conspicuously armed with short stinging hairs, hirtellous at apex and base, otherwise glabrous; the primary branches of inflorescence beset with short stinging hairs, pubescent at the nodes. Staminate flowers white; calyx finely puberulent, 12 mm. long, lobed to the middle, the lobes elliptic, the tube narrow, scarcely 2 mm. in diameter, expanded above, the lobes spreading; stamens 10, in two whorls, 11 mm. long, exserted, basal 2 mm. of staminal column pubescent; lower (outer) stamens with filaments fused for 6 mm., free part of filaments 1.5-2 mm. long; upper (inner) stamens with filaments fused for about 8 mm., free part of filaments about 3 mm. long; anthers 1.5 mm. long; staminodia 2 or 3, filiform, about 4 mm. long, the tips often recurved. Pistillate flowers solitary in the forks of the branches; calyx deciduous, not seen. Young capsules glabrous, beset with scattered short stinging hairs. Capsules about 1 cm. long, beset with scattered stinging hairs. Seeds small, ellipsoid, 7 mm. long, 5 mm. wide, somewhat flattened; caruncle about 1.5 mm. wide, shriveled, subcordate at base above the small protruding hilum.

MEXICO: YUCATÁN, kilometer 27, Mérida-Progreso road, abundant in cactus thicket, July 30, 1938, *C. L. Lundell & Amelia A. Lundell 8201* (TYPE in the herbarium of Southern Methodist University); vernacular names, *xtsaa, chaya*.

Like *C. Chayamansa*, this species appears to be allied to *C. aconitifolius*. In its paired petiolar glands it resembles *C. Chayamansa*, but differs notably from that species in the distinctive characteristics of the androecium, abundance of stinging hairs, larger staminate flowers, and spreading primary veins of leaf.

CNIDOSCOLUS CHAYAMANSA McVaugh, Bull. Torrey Club **71**: 466. 1944.

BRITISH HONDURAS: Orange Walk District, Honey Camp, cultivated in the dooryard, September 17, 1929, *C. L. Lundell 494* (TYPE in the United States National Herbarium), a shrub 4 ft. high.

The plant, also known from Yucatan, apparently has not been found in the wild. A closely related native species is *C. Chaya*, described from Yucatan.

CNIDOSCOLUS ELASTICUS Lundell, Field & Lab. **12**: 33. 1944.

MEXICO: SINALOA, near Chele, Arroyo de la Fresa, Rancho del Pino, altitude 2800 ft., May 9, 1943, *C. L. Lundell 13021* (TYPE in the herbarium of Southern Methodist University), tree, 3 in. diameter, 22 ft. high, bark reddish, flowers white; same locality and date, *Lundell 13020*, tree, 6 in. diameter, 28 ft. high, bark papery and red, flowers white, gland at base of ovary orange; same locality, October, 1943, *C. L. Lundell & Rodolfo Gomez 12613*, tree, 6 in. diameter, 15 ft. high, capsules fleshy, ellipsoid, rostrate; road from Rancho del Pino to Copala, May 28, 1943, *C. L. Lundell & Manuel Itie 12175*, small tree, flowers white. DURANGO, Corral de Piedra, above Tayoltita, Piaxtla River, altitude 5000 ft., April 10, 1943, *Lundell 13001*, tree, 12 in.

diameter, 30 ft. high, bark thin, papery and reddish, staminate flowers white and fragrant; La Joya Mountain (or La Cruz Larga), above Corral de Piedra, Piaxtla River, altitude 5000 ft., April 11, 1943, *Lundell 13008*, tree, 6 in. diameter, 15 ft. high, flowers white; Ojito (or Encinal), above Corral de Piedra, Piaxtla River, altitude 5000 ft., April 12, 1943, *Lundell 13009*, tree, 4 in. diameter, 12 ft. high, flowers white, latex white; Ejido Campanilla, San Felipe de las Minas, near Huajupa, San Lorenzo River watershed, on mountain side, altitude about 5200 ft., April 27, 1943, *Lundell 13012*, tree, 6 in. diameter, flowers white; same locality and date, *Lundell 13013*, small tree, flowers white; below Otaes, on trail to Huajupa, April 26, 1943, *Lundell 13080*, seeds collected in that vicinity by Indians during the previous season; Rancho de la Mina, west of Los Remedios, April 15, 1943, *H. S. Gentry 6820*, reddish barked tree, 18 to 21 ft. high, with blunt twigs, leafless. TEXAS: Dallas County, Agricultural Research Station, near Renner, September 9, 1944, *Lundell 13302*, seedlings six months old grown from seeds obtained in Durango, Mexico.

On March 17, 1944, seeds of *C. elasticus*, obtained at Otaes in the interior mountains of Durango, were planted at the Agricultural Research Station of the Institute of Technology and Plant Industry. In the test plot, the germination of seeds planted in the field was approximately 90 per cent. After a slow start, the seedlings began to grow rapidly in August and September. In September three of the plants flowered. By the middle of November, 1944, at an age of eight months, the seedlings had reached a maximum height of six feet and a diameter up to two inches at the base, a remarkable rate of growth.

The heavy frost of November 27, 1944, at Dallas, when the temperature dropped to 29° F, killed the leaves and tender growth. On the same date there was considerable damage to the cortex for latex oozed out over the stem to coagulate into small scattered lumps. Subsequent temperatures as low as 20° F killed all of the stem except the woody base. Although the roots and base survived a temperature of 20° F, the critical temperature for the species is about 30° F, and no commercial plantings should be made where heavy frosts occur.

The plantation possibilities of *C. elasticus* are the subject of current investigations. The gum from the tree is considered by the chewing gum industry to be a satisfactory substitute for jelutong, formerly imported from the Far East. Intensive exploitation of the wild stand in Durango and Sinaloa is underway.

C. elasticus and the closely related *C. tepiquensis*, the two rubber-yielding species, both have solid pith. In all other members of the Section *Calyptrosolen*, the pith has transverse plates when dry. These differences are of possible subsectional importance.

Cnidoscolus Hernandezii Lundell, sp. nov. Frutex, pilosus et dense stimulosus. Folia petiolata, petiolo ad 16 cm. longo, eglanduloso; lamina ad

13.5 cm. longa, 18 cm. lata, cordata, pilosa, lobis 5, remote dentatis. Inflorescentiae ad 14 cm. latae, pilosae et stimulosae. Capsula ca. 1.2 cm. longa, glabra. Caruncula 2.5–2.8 mm. lata.

Shrub with thick branches; twigs very stout, armed with abundant amber colored stinging hairs up to 6 mm. long, pilose with short hairs; pith drying with transverse plates. Petioles stout, up to 16 cm. long, pilose, armed with scattered stinging hairs; eglandular at apex of petiole. Leaf-blades broader than long, up to 13.5 cm. long, 18 cm. wide, the basal sinus deep, narrow, rounded, the primary lobes and veins usually 5, pilose on both surfaces, the hairs dense along the principal veins, with scattered stinging hairs on upper surface and along margin; the primary lobes extending to middle of blade, oblong-elliptic or obovate-elliptic, the margin of lobes rather remotely dentate with acuminate teeth 2–10 mm. long, the teeth on margin of apical 3 lobes minute below, large above the middle. Inflorescence (in fruit) rather large, up to 14 cm. wide, the peduncle rather slender, up to 23.5 cm. long, densely pilose and conspicuously armed with stinging hairs; the primary branches of the inflorescence usually 2 or 3, forked, covered with indument like that of peduncle. Staminate and pistillate flowers not seen. Ovary pubescent at apex and base, otherwise glabrous; style pubescent. Capsule oval, depressed at apex, about 1.2 cm. long, glabrous. Seeds oblong-ellipsoid, somewhat flattened, 8.5–9 mm. long, about 5.5 mm. wide, mottled at maturity primarily along margin, acutish at apex; caruncle fleshy, yellowish, 2.5–2.8 mm. wide, subtruncate or rounded, with two small fleshy lobes at base on each side of the small hilum, crested medianally above the hilum.

MEXICO: OAXACA, Santa María del Tule, October 17, 1943, *Efraim Hernandez X. s. n.* (TYPE in the herbarium of Southern Methodist University); vernacular name, *mala mujer*.

C. Hernandezii is anomalous in that the petioles are eglandular at apex. The pilose twigs, leaves and inflorescences, abundant short amber colored stinging hairs, essentially glabrous ovary, and distinctive small seeds with crested caruncle bilobulate at the subtruncate base are distinguishing characteristics. In the absence of flowers, its affinities are uncertain.

Cnidoscolus Jurgensenii (Briq.) Lundell, comb. nov. *Jatropha Jurgensenii* Briq. Ann. Cons. Jard. Bot. Genève 4: 229. 1900.

Cnidoscolus Liebmannii (Muell. Arg.) Lundell, comb. nov. *Jatropha Liebmannii* Muell. Arg. Linnaea 34: 212. 1865.

No specimens have been seen which may be referred to this species, and a study of the type is essential to definitely determine its status. As described, the lacinate lobes of the leaves, the glabrous staminal tube, combined with a pistillate calyx tubular to the middle indicate that a distinct species is represented.

Cnidoscolus macrandrus Lundell, sp. nov. Frutex, parce stimulosus. Folia petiolata, petiolo ad 13 cm. longo; lamina membranacea, ad 15 cm. longa, 22 cm. lata, cordata, parce stimulosa, glabrata, lobis 5 vel 7, cuspidato-acuminatis, remote dentatis. Inflorescentiae parvae, ad 8 cm. longae. Sepala ♂ 15–16 mm. longa, ad medium connata. Stamina 10, biverticillata, 8 mm. longa. Antherae 3 mm. longae, 2 mm. latae.

Shrub; twigs stout, with a few short stinging hairs at apex only, sparsely pubescent at the nodes, glabrate; pith with transverse plates. Petioles cos-

tate, up to 13 cm. long, sparsely pubescent at first with subappressed hairs, glabrate, unarmed or beset with few short stinging hairs; gland at apex of petiole fleshy, slightly elevated. Leaf-blades very thin, broader than long, up to 15 cm. long (from apex of petiole), up to 22 cm. wide, the basal sinus open and rounded, the primary lobes and veins 5 or 7, with scattered small stinging hairs on upper surface and along margin at first, pubescent at base on both surfaces, glabrate, the margin ciliate with appressed hairs, otherwise glabrous; lobed at least three-fourths to base of blade, the lobes oblanceolate, cuspidate-acuminate, the margin of lobes dentate with small acute and larger acuminate teeth, without conspicuous secondary lobes. Inflorescence small, up to 8 cm. long, 4–5 cm. wide, the peduncle slender, up to 6 cm. long, sparsely pubescent, beset above middle with short stinging hairs; the primary branches of inflorescence 2 or 3, forked, pubescent and beset with scattered stinging hairs. Pistillate flowers and fruits not seen. Staminate flowers white; calyx sparsely pubescent, the buds obovate, the mature calyx 15–16 mm. long, short-stipitate at base, campanulate, the tube wide, lobed to the middle, the lobes up to 7 mm. long, 6 mm. wide, elliptic. Stamens 10, in two whorls, 8 mm. long, villous at base of staminal column; the gland lobed, thick; lower (outer) stamens with filaments fused 2–2.5 mm., free part of filaments about 3 mm. long; upper (inner) stamens with filaments fused for about 4 mm., free part of filaments about 3 mm. long; anthers 3 mm. long, 2 mm. wide; staminodia 3, filiform, about 4 mm. long.

MEXICO: VERA CRUZ, between Jesus Carranza and Suchilapan, altitude 200 ft., along edge of trail in wet lowland forest, January 24, 1943, *C. L. Gilly, Sr. 4713* (TYPE in the herbarium of Southern Methodist University).

The reduced inflorescence, small leaves, large staminate flowers, large anthers, and the peculiarities of the staminal column set this species apart.

CNIDOSCOLUS MULTILOBUS (Pax) I. M. Johnst. Contr. Gray Herb. 68: 86. 1923. *Jatropha multiloba* Pax, Pflanzenreich IV. 147: 107. 1910.

MEXICO: SAN LUIS POTOSÍ, El Banito, near Valles, July 14, 1943, *C. L. Lundell & Amelia A. Lundell 12244*, a shrub or tree, up to 6 in. diameter, 20 ft. high, latex white, calyx white; Tamazunchale, along rocky ravine off highway to Chapulhuacan, July 15, 1943, *Lundell & Lundell 12260*, low shrub, almost glabrous, viscid; same locality and date, *Lundell & Lundell 12261*, arborescent shrub, calyx white.

The type of *C. multilobus*, *Bourgeau 2231* from Orizaba, Vera Cruz, is not available, and no authentic specimens of the species have been seen. That collections representing a series of closely related species are now being pigeon-holed under this name appears probable.

The collections from San Luis Potosí are being referred to *C. multilobus* tentatively. The seeds of *Lundell & Lundell 12244* have the same caruncle as illustrated by McVaugh (1943, fig. 13). *Lundell & Lundell 12260* is anomalous in that the leaves are viscid when fresh, a condition not noted in any other collection. The leaf-blades of *Lundell & Lundell 12244* and *12261* are velutinous. In all three collections, the apex of the petiole bears two mammae-form fleshy glands.

Of the new species proposed, *C. macrandrus*, *C. parviflorus*, and *C. velutinus* belong to the *C. multilobus* complex.

Cnidocolus orbiculatus Lundell, sp. nov. Herbacea, ad 1 m. alta, caulis dense stimulosus. Folia petiolata, petiolo 1.5–8.5 cm. longo, stimulosus, supra

villosa; lamina orbiculata, ad 9 cm. longa, 14.5 cm. lata, profunde cordata, stimulosa, supra parce villosa, subtus parce hispida, lobis 3, grosse sinuato-dentatis. Inflorescentiae foliis breviores, 1.5-3, raro ad 5 cm. longae, stimulosae. Sepala ♂ stimulosa, 12-13 mm. longa, ad medium connata. Stamina 10, biverticillata. Sepala ♀ 9-11 mm. longa, stimulosa. Capsula ca. 1.4 cm. longa, rostrata. Caruncula 3 mm. lata.

Perennial herb up to 1 m. high, bushy; stems stout, densely armed with slender stinging hairs up to 11 mm. long; twigs comparatively slender, densely covered with stinging hairs of various lengths, pubescent at the nodes, glabrous otherwise. Petioles rather slender, costate, 1.5-8.5 cm. long, beset with slender stinging hairs, short villous on upper surface, otherwise glabrous; gland at apex of petiole suborbicular, large, fleshy. Leaf-blades broader than long, orbicular in outline, up to 9 cm. long (from apex of petiole), up to 14.5 cm. wide, cordate with deep open basal sinus, the primary veins usually 7, shallowly 3-lobed at apex, beset with slender stinging hairs on both surfaces, short villous at base and along primary veins on upper surface, sparsely hispid over the entire lower surface; the margin appressed hispid, coarsely sinuate-dentate, the teeth up to 1.5 cm. long, broad at base, acuminate, spinescent but not hair-like at tips. Flowers in small cymes hidden at the ends of leafy branches; inflorescence usually 1.5-3 cm. long including peduncle, rarely up to 5 cm. long with mature fruits; the peduncle and branches short villous in a single line, beset with stinging hairs. Staminate flowers white; calyx lobes beset with stinging hairs, the calyx otherwise entirely glabrous, 12-13 mm. long, the tube slender at base, gradually expanded upward, the lobes extending to the middle, elliptic; stamens 10, in two whorls, 9 mm. long, not stipitate above the gland, the basal 0.5 mm. of staminal column pubescent; lower (outer) stamens with filaments fused for 3.5 mm., free part of filaments about 1.5 mm. long, anthers about 1.5 mm. long; upper (inner) stamens with filaments fused for about 6 mm., free part of filaments about 2 mm. long, anthers about 1.5 mm. long; staminodia 1-3, about 2 mm. long, filiform. Pistillate flowers solitary in the forks of the branches; calyx 5-lobed to base, 9-11 mm. long, the lobes oblanceolate-linear, rounded at apex, beset above middle with stinging hairs, otherwise entirely glabrous. Ovary with a ring of hairs at base, otherwise glabrous, rostrate at apex, the base of style fused, styles 3, glabrous, forked. Capsules broadly oval, about 1.4 cm. long including abruptly narrowed rostrate apex, beset with scattered stinging hairs, pubescent at base, glabrous otherwise. Seeds mottled brown, oblong, 8 mm. long (including the protruding caruncle), 5 mm. wide, apex and base subtruncate; caruncle fleshy, 3 mm. wide, extending below the hilum, base broadly rounded, 2-lobed, the small hilum seated between the protruding lobes.

MEXICO: MORELOS, about 9 kilometers beyond Alpuyecá on Cacahuamilpa road, in fallow field and along roadside, July 31, 1943, *C. L. Lundell & Amelia A. Lundell 12312* (TYPE in the herbarium of Southern Methodist University).

C. orbiculatus has affinity to *C. calyculatus* (Pax & Hoffm.) I. M. Johnst., *C. angustidens* Torr., and *C. Pringlei* I. M. Johnst. These herbaceous species are very closely allied, and additional field work will be necessary to obtain adequate specimens for the delimitation of the entities. In many respects, *C. orbiculatus* agrees with the description of *C. calyculatus*, but differs at

once in having fused rather than free filaments in the lower (outer) staminal series, and longer calyces glabrous except for the stinging hairs. In *C. angustidens* the inflorescence is comparatively large, the teeth of the leaves are long and slender, the seeds are larger, and the leaves are conspicuously lobed. *C. Pringlei*, known only from description, has smaller more conspicuously lobed leaves, a laxly flowered inflorescence, puberulent calyces, and smaller capsules. Noteworthy in *C. orbiculatus* is the small congested inflorescence almost concealed by the leaves.

Cnidoscolus parviflorus Lundell, sp. nov. Frutex, 2 m. altus, parce stimulosus, glabratus. Folia longe petiolata, petiolo ad 21 cm. longo; lamina ad 18 cm. longa, 22 cm. lata, profunde cordata, pilosa, lobis 3 vel 5, supra dentatis. Sepala ♂ 6.5–9 mm. longa, ad medium connata. Stamina 10, raro 6 vel 9, biverticillata, ca. 6 mm. longa. Sepala ♀ 4–4.5 mm. longa. Ovarium pubescens. Capsula 12 mm. longa. Caruncula parva, ca. 1 mm. lata.

Shrub, 2 m. high, practically unarmed; twigs rather slender, beset with scattered ascending stinging hairs scarcely 2 mm. long, short pilose, glabrate with age; pith with transverse plates. Petioles densely short pilose, usually unarmed, up to 21 cm. long; glands at apex fleshy, entire or shallowly lobed, slightly elevated. Leaf-blades slightly broader than long, up to 18 cm. long (from apex of petiole), up to 22 cm. wide, deeply cordate at base, the sinus open and rounded, the primary lobes 3 or 5, pilose on both surfaces, the hairs thinner and shorter on upper side, beset with a few small subappressed stinging hairs along margin and primary veins, otherwise unarmed; lobed to below the middle of blade, the apical lobes obovate-oblong, acuminate, the sinuses open and rounded, the margin of lobes conspicuously dentate above the middle with few acute or acuminate teeth up to 1.2 cm. long. Inflorescence small and flat, up to 6.5 cm. wide, the peduncle up to 22 cm. long, the peduncle and branches densely pubescent with soft short somewhat matted hairs, unarmed or beset with very few small stinging hairs. Staminate flowers white; calyx finely tomentose, 6.5–9 mm. long, tube subcampanulate, lobed to the middle, the lobes elliptic or suborbicular, up to 4 mm. wide, cordate at base; stamens usually 10, sometimes reduced to 6 or 9, in two whorls, about 6 mm. long, basal 1 mm. of staminal column pubescent; the staminal column 2 mm. high; lower (outer) stamens with filaments free for about 2 mm.; upper (inner) stamens with filaments free for 3.5–4 mm.; the free part of both whorls attached to staminal column at same point; anthers about 1.5 mm. long; staminodia 1–3, filiform, up to 5.5 mm. long. Pistillate flowers solitary in the forks of the branches; calyx finely tomentose, lobed to the base, the lobes oblong, 4–4.5 mm. long; ovary densely pubescent with short hairs; styles sparsely pubescent, sessile. Capsules subglobose, about 12 mm. long, sparsely pubescent and beset with short stinging hairs, warty over the entire surface. Seeds brown, oblong-ellipsoid, slightly compressed, about 9 mm. long, 5.5 mm. wide; caruncle small, scarcely 1 mm. wide, narrowed to base above hilum, the margin curled.

MEXICO: SAN LUIS POTOSÍ, off Xilitla road, on mountain side above the Axtla River, August 21, 1943, *C. L. Lundell & Amelia A. Lundell 12427* (TYPE in the herbarium of Southern Methodist University).

C. parviflorus is near *C. multilobus*, but the smaller flowers, smaller anthers, distinctive caruncle scarcely 1 mm. wide, persistently pubescent leaves, and the almost complete absence of stinging hairs distinguish it. The

short staminal column with free filaments of both whorls attached at the same point at apex is noteworthy. In some staminate flowers there are as few as six stamens, an aberrant condition not noted among other Mexican species.

Cnidocolus rostratus Lundell, sp. nov. Frutex, 1–2 m. altus, stimulosus et dense pilosus. Folia longe petiolata, petiolo ad 14 cm. longo; lamina cordata, 8–17 cm. longa, 6.8–17 cm. lata, velutina, lobis 3, raro 5, dentatis. Inflorescentiae parvae, pilosae et parce stimulosae. Sepala ♂ ca. 13 mm. longa, ad medium connata. Stamina 10, biverticillata. Sepala ♀ lineari-oblonga, ca. 9 mm. longa. Ovarium tomentosum, rostratum. Capsula rostrata.

Shrub, 1–2 m. high; branches thick, tuberculate, the tubercles covered with coarse stinging hairs; twigs stout, densely pilose and covered with coarse subappressed stinging hairs up to 7.5 mm. long; pith continuous, without dissepiments before drying. Petioles rather stout, up to 14 cm. long, densely pilose, the stinging hairs few and scattered; gland at apex of petiole large, fleshy, suborbicular to reniform. Leaf-blades cordate, 8–17 cm. long, 6.8–17 cm. wide, usually with 3, rarely 5 primary lobes and veins, the basal sinus open, subtruncate or rounded, both surfaces densely pilose (velutinous), the stinging hairs small, few and scattered on upper surface, often absent from lower surface; the primary lobes extending to the middle of the blade, the terminal one obovate, each acuminate and spinescent, the margin coarsely toothed with few acuminate spinescent teeth, these terminating the secondary veins. Inflorescence small, 3–4 cm. wide, the peduncle stout, up to 14 cm. long, densely short pilose and armed with scattered stinging hairs; the primary branches of the inflorescence usually 2 or 3, forked 1 or 2 times, densely short pilose and armed with scattered small stinging hairs. Staminate flowers white (only 1 lodged in inflorescence seen); calyx pubescent, about 13 mm. long, lobed to the middle, the lobes oblong-elliptic, spreading; staminal column stipitate above the annular gland, pubescent at base; lower stamens included, the filaments united into a tube only about 1.5 mm. long; stamens 10 in two whorls; anthers of lower (outer) ones subsessile, 2.2 mm. long; anthers of upper ones slightly smaller, exerted, the free part of filaments about 2.5 mm. long; staminodia 2, less than 1 mm. long. Pistillate flowers solitary in the forks of the branches; calyx pubescent, the lobes splitting almost to the base, about 9 mm. long, linear-oblong, beset with a few stinging hairs. Ovary tomentose, rostrate at apex, the thick base of style persistent. Immature capsules ovoid-ellipsoid, costate, conspicuously rostrate, pubescent, not armed with stinging hairs.

MEXICO: OAXACA, north of Huajuápam, on black arid limestone hills of high plateau, July 26, 1943, *C. L. Lundell 12304* (TYPE in the herbarium of Southern Methodist University).

The pistillate calyx is lobed almost to the base as evidenced by the fragmentary flowers available. Although of doubtful relationship, the species is very distinct.

Among arborescent members of the genus in Mexico, only *C. elasticus* has a rostrate capsule similar to that of *C. rostratus*. Another peculiarity of the species is the presence on older wood of tubercles densely covered with stinging hairs.

CNIDOSCOLUS SOUZAЕ McVaugh, Bull. Torrey Club 71: 468. 1944.

MEXICO: CAMPECHE, Tuxpeña, in secondary growth, January 15, 1932, *C. L. Lundell 1189* (TYPE in the Gray Herbarium), a shrub. YUCATAN, near

Piste, abundant in low thicket, June 14, 1938, *C. L. Lundell & Amelia A. Lundell 7549*, a shrub, 6–12 ft. high, flowers white.

The 1938 collection from Yucatan differs slightly in having staminate flowers up to 12 mm. long, but agrees rather closely in other characteristics, notably in having the filiform stipitate glands at the apex of the petiole and the gland-tipped setae of the leaf margin.

The stipitate petiolar glands of *C. Souzae* and the substipitate mammaeform glands in *Lundell & Lundell 12244* from San Luis Potosí, referred tentatively to *C. multilobus*, suggest a relationship. Further, the leaves of *C. Souzae* are similar in form to those of *C. multilobus* and allied species. There is considerable justification for the reference of this well-marked species to the Section *Calyptosolen*.

Cnidoscolus spinosus Lundell, sp. nov. Arbor parva ad 5 m. alta; rami crassi, stimulosi, ceterum glabri. Folia longe petiolata, petiolo ad 22.5 cm. longo; lamina 9–20 cm. longa, 12–29 cm. lata, ad basim cordata, parce stimulosa, glabrata, lobis 3 vel 5, apice rotundatis, dentatis. Inflorescentiae ad 25 cm. latae, longe pedunculatae. Sepala ♂ puberula, ca. 13 mm. longa, ad medium connata. Stamina 10, biverticillata. Sepala ♀ ca. 8 mm. longa, ad medium connata. Capsula 1 cm. longa, stimulosa. Caruncula 2.5 mm. lata, basi cordata.

Arborescent shrub or small tree up to 5 m. high; pith with transverse plates; twigs thick, armed with rigid spine-like stinging hairs up to 1.3 cm. long, glabrous otherwise. Petioles thick, up to 22.5 cm. long, puberulent at apex and base, the stinging hairs few, scattered, glabrous otherwise, drying costate; gland at apex of petiole large, fleshy, suborbicular. Leaf-blades cordate or cordate-orbicular, 9–20 cm. long, 12–29 cm. wide, with 3 or 5 primary lobes and veins, the basal sinus narrow and deep, upper surface covered at first with stinging hairs, these scattered and inconspicuous or absent at maturity, otherwise glabrous, undersurface puberulent along primary veins at base, otherwise glabrous, the stinging hairs persistent along margin of basal sinus; the primary lobes extending almost to middle of blade, the terminal and two lateral ones (in 5-lobed leaves) obovate-orbicular, the margin of lobes dentate, the teeth triangular-acuminate, up to 1 cm. long. Inflorescence large, standing out above the leaves, up to 25 cm. across, the peduncle thick, up to 45 cm. long, puberulent at apex and base, armed with long stinging hairs, otherwise glabrous; the primary branches of the inflorescence usually 3 or 4, forked up to 6 times, armed with stinging hairs. Staminate flowers white; calyx finely puberulent, about 13 mm. long including a short basal stipe, lobed to the middle, the lobes elliptic, spreading; staminal column pubescent at base, short stipitate above gland; stamens 10, in two whorls; lower stamens included in tube, the united filaments about 2 mm. long, subequal, anthers about 2.3 mm. long; upper (inner) stamens exerted, the free part of filaments about 2.5 mm. long, the anthers 2 mm. long; staminodia 3, filiform, equaling the upper stamens, about 3.5 mm. long. Pistillate flowers solitary in the forks of the branches; calyx deciduous in one piece, finely pubescent, about 8 mm. long, 5-lobed to the middle or lower, the lobes elliptic. Ovary hirtellous at apex and base, otherwise glabrous; styles 3, hirtellous, forked 3 times, spreading. Capsules broadly ellipsoid, 1 cm. long (almost mature), armed with stinging hairs, otherwise glabrous. Immature seeds oblong-ellipsoid, 8.5 mm. long, 6 mm. wide, somewhat flattened; caruncle 2.5 mm. wide, flat, cordate at base.

MEXICO: JALISCO, Municipio Puerto Vallarta, Chimo, along seashore, altitude 6-30 ft., June 8, 1943, *C. L. Lundell 13028, 13029* (TYPE in the herbarium of Southern Methodist University); vernacular name, *hiedra*.

C. spinosus is abundant along the seashore at Chimo, growing where salt spray often covers the plants. It is evidently a local endemic easily recognized by the dense investiture of stiff stinging hairs, essentially glabrous leaves with rounded lobes, and exceptionally large inflorescences. The pistillate calyx, united at base and deciduous in one piece, is typical of the small complex of species which includes *C. tepiquensis* of the same region.

From tapping cuts in the cortex of *C. spinosus*, latex oozes out in quantity but does not flow sufficiently to permit collection.

Cnidoscolus tenuilobus Lundell, sp. nov. Frutex, 1-2 m. altus, fere estimulosus. Folia petiolata, petiolo ad 21 cm. longo, parce setuloso; lamina ad 20 cm. longa, 30 cm. lata, ad basim cordata, adpresso-setulosa, lobis 5, pinnatifidis, acuminatis. Sepala ♂ puberula, 9-10.5 mm. longa. Stamina 10, 6.5-7.5 mm. longa, biverticillata. Sepala ♀ libera, ca. 7 mm. longa, puberula, stimulosa. Capsula ca. 8 mm. longa, stimulosa. Caruncula 3 mm. lata, basi cordata.

Slender shrub, 1-2 m. high; twigs densely puberulent, practically unarmed, the stinging hairs less than 2 mm. long; pith with transverse plates. Petioles slender, up to 21 cm. long, sparsely setulose with short recurved hairs, densely puberulent at base, glabrous otherwise; gland at apex of petiole fleshy, large, reniform. Leaf-blades broader than long, up to 20 cm. long (from apex of petiole), 30 cm. wide, with broad open round sinus at base, the primary lobes and veins usually 5, sometimes with 2 additional smaller lobes at base, setulose over the entire upper surface with short appressed hairs, setulose along the principal veins on undersurface, sparsely pubescent at base, the margin appressed-setulose, otherwise glabrous; lobes slender, 5-12 mm. wide, cut almost to the base of blade, pinnatifid, the secondary lobes slender, less than 15 mm. wide, the primary and secondary lobes with few triangular teeth up to 15 mm. long, the lobes and teeth acute or acuminate. Inflorescence comparatively small, up to 8 cm. across top, the peduncle slender but erect, up to 40 cm. long, puberulent, sparsely but persistently setulose; the primary branches of inflorescence 2 or 3, forked, densely puberulent and setulose. Staminate flowers with greenish calyx, minutely puberulent, 9-10.5 mm. long, the lobes 3-3.5 mm. long, broadly elliptic or ovate-elliptic, the tube large, about 2.5 mm. in diameter at base, gradually expanded above; stamens 10, in two whorls, 6.5-7.5 mm. long; the gland at base shallowly lobed, 1.5 mm. in diameter; lower (outer) stamens with filaments fused scarcely 1 mm. at base, free part of filaments 1.5-2 mm. long, the base of column densely villous for at least 1 mm.; upper (inner) stamens with filaments fused 4-5 mm., free part of filaments 1.5-2 mm. long; anthers up to 1.5 mm. long, the upper slightly smaller; staminodia 3, filiform, up to 4 mm. long. Pistillate flowers solitary in the forks of the branches, pedicellate; calyx 5-lobed to base, greenish, about 7 mm. long, the lobes finely puberulent, setulose with short stinging hairs, linear-oblong, 1.8-2.5 mm. wide; ovary sparsely appressed hairy at base, otherwise glabrous; styles 3, thick, spreading, glabrous, multi-lobed. Capsules subglobose-ellipsoid, about 8 mm. long, beset with short stinging hairs. Seeds gray, inconspicuously mottled with black, obovoid-ellipsoid, about 7 mm. long, 5 mm. wide, base

slightly emarginate, rounded, apex acutish; caruncle fleshy, up to 3 mm. wide, with thick rounded smooth edges, cordate at base, the broad basal lobes extending slightly below the small protruding hilum.

MEXICO: GUERRERO, near Acapulco, kilometer 417 along highway, on roadside ledges, October 20, 1943, *C. L. Lundell & Amelia A. Lundell 12583* (TYPE in the herbarium of Southern Methodist University).

From *C. aconitifolius*, which it approaches, *C. tenuilobus* is distinguished by narrowly lobed pinnatifid leaves, appressed setulose upper surface of the leaf blades, setulose calyx lobes of the pistillate flowers, gland at base of androecium 1.5 mm. in diameter (less than 1 mm. wide in *C. aconitifolius*), and by a flat cordate caruncle with rounded smooth edges.

CNIDOSCOLUS TEPIQUENSIS (Cost. & Gall.) McVaugh, Bull. Torrey Club **71**: 466. 1944. *Cnidocolus tepiquensis* (Cost. & Gall.) Lundell, Field & Lab. **12**: 36. 1944. *Jatropha tepiquensis* Cost. & Gall. Rev. Gen. Bot. **18**: 391. 1906.

MEXICO: NAYARIT, Municipio San Blas, Ejido La Palma, June 14, 1943, *C. L. Lundell & Manuel Itie 12171*, tree, branches verticillate, flowers white; Municipio San Blas, Ejido Aticama, June 15, 1943, *Lundell & Itie 12172*, tree, flowers white; Acaponeta, Ejido San Jose de Gracia, September 21, 1943, *Efraim Hernandez X. s. n.*, tree in fruit. SINALOA, Hacienda Chele, Rancho del Pino, on mountain side, altitude 1500 ft., June, 1943, *Lundell & Itie 12174*, small tree, flowers white. JALISCO, Municipio Puerto Vallarta, on hills above Chimo, in coquital, June 9, 1943, *C. L. Lundell 13035*, tree, 3 in. diameter, 30 ft. high, branches verticillate in threes, bark white, pith solid and continuous in twigs, flowers white, latex white; same locality and date, *Lundell 13036*, tree, 8 in. diameter, 35 ft. high, branches verticillate in threes, pith solid and continuous, flowers white, latex white; Municipio Puerto Vallarta, Arroyo de las Amapas, June 20, 1943, *C. L. Lundell & Rodolfo Gomez s. n.*, flowers white.

C. tepiquensis, of importance as the source of lowland chilte gum, is perhaps the largest tree in the genus, reaching a measured size of 18 inches in diameter and 80 feet high. Trees up to 3 feet in diameter and 100 feet high have been reported from Jalisco. The species has been found as far north as Concordia, Sinaloa, and it ranges through Nayarit into northern Jalisco as far south as Tomatlan. The best stands are in Municipio Puerto Vallarta, Jalisco.

In southern Sinaloa no stands of commercial importance have been located; the trees are found there principally along banks of arroyos and creeks. In Nayarit, approximately 125,000 acres were surveyed in the districts of Ixcuintla, San Blas, and Compostela. In this region, 2 to 2.5 per cent of the area is covered with chilte stands averaging about 40 trees per acre. In the coastal area of Nayarit, the tree is an associate of the *coquito* palm, a species of *Orbignya*. Inland the clearing for agriculture has destroyed most of the virgin forest, so that the species is found chiefly in secondary growth.

In the Municipio Puerto Vallarta, Jalisco, where the *coquito* palm forest has been protected, chilte is one of the dominant elements of the vegetation.

On the seaward slopes of the mountains from Puerto Vallarta to Corrales, there is a continuous belt of the *coquito* palm and *C. tepiquensis*.

C. tepiquensis is the source of all the chilte gum from the Pacific lowlands. It is known as chilte, chilte blanco, and chiele. Although locally exploited over a period of years for use in the manufacture of novelties, commercial exploitation on a large scale did not get underway until 1942. The dry gum has an average rubber content of approximately 30 per cent.

In Sinaloa and Nayarit exploitation has been carried out on a very limited scale, and the stands in Nayarit are practically virgin. The principal source of lowland chilte has been the Municipio Puerto Vallarta in Jalisco; here a production up to 13 tons per week was reached during the 1942-1943 season.

The most accessible stands of Municipio Puerto Vallarta have been excessively tapped. Protuberances cover the trunks where cuts have penetrated through the cambium. Some trees have died and others have sections of the trunk in various stages of decay, but a remarkably large percentage of those severely tapped are healing up.

Tapping has been done in a haphazard manner with various tools. Usually alternate diagonals are slashed on the sides of the tree. The space between these varies greatly depending upon the condition of the trunk. The diagonals usually are not joined, and the latex flows from one to another until it reaches the base of the tree where it is collected in bamboo containers. Tappers have no regular schedule or assigned stands. Inquiries indicate that the trees are retapped at two-week intervals.

The trees give an estimated average yield of about 200 cc. of latex per tapping. The latex coagulates naturally overnight, or immediately upon the addition of water. Gum is prepared for market both in sheet and block form. For the preparation of sheets, blocks are chopped up, the gum pieces placed in hot water until soft, and then laminated. Sheets are shade dried for about three days before packing in henequen sacks.

The stands in the Municipio Puerto Vallarta could yield an estimated 700 tons of gum annually if fully exploited with a rational tapping system. A production of at least 200 tons annually should be possible from the stands in Nayarit and Sinaloa.

With continued unregulated exploitation, the wild stand of *C. tepiquensis* will be decimated within a decade.

Cnidoscolus tomentosus Lundell, sp. nov. Frutex, hirtellus et stimulosus. Folia petiolata, petiolo ad 9.5 cm. longo; lamina ad 12 cm. longa, 16 cm. lata, cordata, supra pilosa, subtus tomentosa, lobis 3 vel 5, paucidentatis. Inflorescentiae parvae. Capsula 1.6 cm. longa, stimulosa. Semina 10.5-11.5 mm. longa, 7-8 mm. lata. Caruncula 3.5-4.5 mm. lata.

Shrub; twigs stout, densely hirtellous at first, armed with stinging hairs up to 5 mm. long; pith with transverse plates. Petioles stout, costate, shorter

than the blade, up to 9.5 cm. long; the gland at apex of petiole fleshy, conspicuous, suborbicular. Leaf-blades broader than long, up to 12 cm. long (from apex of petiole), 16 cm. wide, the basal sinus rounded, open, the primary lobes and veins 3 or 5, usually 5, densely pilose on upper surface, tomentose on lower surface, with scattered short stinging hairs on upper surface and along margin, the stinging hairs absent on undersurface at maturity; the lobes extending to middle of blade, oblong or obovate-oblong, the margin of lobes subentire or dentate with 1-several remote acuminate teeth, the teeth up to 1 cm. long, mostly above middle of lobes, and at base of blade. Inflorescence (in fruit) small, 6 cm. wide, the peduncle thick, 11 cm. long, densely hirtellous, the short stinging hairs few and scattered; the primary branches 2, forked, with indument like that of peduncle. Staminate and pistillate flowers not seen. Capsules about 1.6 cm. long, sparsely pubescent, beset with short stinging hairs. Seeds oblong-ellipsoid, somewhat flattened, 10.5-11.5 mm. long, 7-8 mm. wide, conspicuously mottled at first, nearly black at maturity, truncate and slightly emarginate at base, acutish at apex; caruncle fleshy, large, 3.5-4.5 mm. wide, with two triangular wings, cordate at base, extending to below the small depressed hilum.

MEXICO: OAXACA, Santa María del Tule, October 17, 1943, *Efraim Hernandez X. s. n.* (TYPE in the herbarium of Southern Methodist University); vernacular name, *mala mujer*.

C. tomentosus was collected in the same locality as *C. Hernandezii*, and bears a resemblance to that species. It differs at once in having petioles glandular at apex, larger seeds with dissimilar caruncle, and sparsely pubescent capsules.

Cnidoscolus velutinus Lundell, sp. nov. Frutex, ca. 4 m. altus, pilosus et stimulosus. Folia longe petiolata, petiolo ad 37 cm. longo, stimulosus; lamina cordata, ad 28 cm. longa, 43 cm. lata, velutina, lobis 5, obovatis, remote dentatis. Sepala ♂ velutina, alba, 14-17 mm. longa. Stamina 10, 9-11 mm. longa, biverticillata. Sepala ♀ velutina, libera, 8-12 mm. longa, ad 5 mm. lata. Ovarium pubescens. Capsula ca. 12 mm. longa. Semina oblongo-ellipsoidea, ca. 9 mm. longa, 5.5 mm. lata. Caruncula 3 mm. lata, basi cordata.

Shrub, about 4 m. high; twigs thick, short pilose and beset with slender stinging hairs up to 5 mm. long; pith with transverse plates. Petioles stout, costate, pilose with rather firm hairs, beset with stinging hairs, up to 37 cm. long; gland at apex fleshy, shallowly lobed. Leaf-blades up to 28 cm. long (from apex of petiole), up to 43 cm. wide, deeply cordate at base, the sinus broad and rounded, the primary lobes 5, persistently velutinous on both surfaces with soft short hairs, the indument dense on lower surface, beset with few scattered hairs on upper surface and along margin; lobed to below the middle of blade, the apical lobes obovate, cuspidate, the sinuses narrow but rounded and open, the margin of upper two-thirds of lobes cuspidate-dentate with rather remote conspicuous teeth, the base of lobes dentate with smaller remote acute teeth. Inflorescence 4-13 cm. wide, the peduncle stout, 7.5-21 cm. long, the peduncle and branches densely velutinous, beset with few scattered stinging hairs or unarmed. Staminate flowers white; calyx velutinous, 14-17 mm. long, the tube comparatively slender, lobes short, broadly ovate-elliptic; stamens 10, in two whorls, 9-11 mm. long, basal 1.5 mm. of staminal column pubescent; lower (outer) stamens with filaments fused for 4 mm., free part of filaments about 2.5 mm. long; upper (inner)

stamens with filaments fused for 6 mm., free part of filaments about 3 mm. long; anthers 2.2–4 mm. long; staminodia 3, filiform, 4.5 mm. long. Pistillate flowers solitary in the forks of the branches, rarely geminate, pedicellate; calyx velutinous, lobed to the base, the lobes oblong or oblong-elliptic, 8–12 mm. long, up to 5 mm. wide; ovary yellow, pubescent; styles united at base, multilobed, sparsely hirtellous. Capsules broadly ellipsoid, about 12 mm. long, pubescent and beset with stinging hairs. Seeds brown, oblong-ellipsoid, slightly wider above center, about 9 mm. long, 5.5 mm. wide, with a narrow but conspicuous dorsal ridge, apex acutish; caruncle fleshy, 3 mm. wide, cordate at base, the lobes extending to or below hilum, the margin thick and smooth.

MEXICO: GUERRERO, near Xaltianguis, kilometer 407 of highway, on mountain side, October 20, 1943, *C. L. Lundell & Amelia A. Lundell 12592* (TYPE in the herbarium of Southern Methodist University).

Lundell & Lundell 12592 agrees rather closely with the brief original description of *C. multilobus*, but differs significantly in technical details from the interpretation of the species by McVaugh (1943). Since the more detailed study of McVaugh presumably is based upon a reinterpretation of type material, there is ample reason for considering that an undescribed species is represented.

The caruncle of *C. velutinus*, cordate at base and with thick rounded edges, is altogether different from the caruncle described and figured by McVaugh (1943, fig. 13) for *C. multilobus*.

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