

TRAGIA L.

Reference: Urtecho, R. J. A Taxonomic Study of the Mexican Species of Tragia (Euphorbiaceae). Ph.D. Dissertation, University of California, Davis. 1996.

Monoecious herbs, subshrubs, or vines; indumentum of leaves and stems partly of stinging hairs, sometimes also glandular; leaves alternate, entire or dentate (rarely lobed), petiolate or sessile, stipulate; inflorescences bisexual, racemiform, terminal or opposite leaves, female flowers solitary at proximal 1-several nodes, male flowers solitary at distal nodes; bracts persistent; flowers apetalous, disk absent; male flowers with articulate pedicels; sepals 3-6, valvate; stamens 2-5 [-50 in extralimital taxa], filaments connate at least at base; pistillode minute or absent; female flowers pedicellate; sepals usually 6, imbricate, entire; ovary 3-locular, usually hispid-stimulose; ovules 1 per locule, anatropous; fruit capsular; columella persistent; seeds smooth, ecarunculate; endosperm copious; embryo straight.

This large genus of ca 100 species is distributed widely in tropical to warm temperate regions; at least 5 species are represented in our area. Tragia carteri Urtecho, included in the key, has not yet been confirmed for our area, but may occur in Nayarit.

Plukenetieae--Tragiinae.

1. Ovary covered with glandular branched processes; inflorescence glandular; stamens 3; leaves ovate-cordate. Tragia pacifica

1. Ovary with urticant hairs, lacking glandular trichomes.

2. Styles 4-6 mm long; stamens 10 or more; inflorescences not glandular; leaves ovate-cordate, 2.5-7 cm long.

Tragia affinis

2. Styles 2-3.5 mm (at anthesis); stamens 2-3; inflorescences glandular or eglandular; leaves ovate to linear, 1-10 cm long.

3. Fruiting pedicels 2-4.5 cm long; ovary in some flowers 2-horned on each locule; stigmas smooth; seeds reticulate-alveolate. Tragia volubilis

3. Fruiting pedicels less than 2 cm long; ovary never horned; stigmas smooth or papillate; seeds not reticulate-alveolate.

4. Inflorescences lacking stipitate glands; stigmas

papillate.

T. nepetifolia

4. Inflorescences stipitate-glandular; stigmas smooth to subpapillate.

5. Petioles of larger leaves mostly 10-30 mm long; _ pedicels 2-6 mm long in fruit. T. mcvaughii

5. Petioles mostly 3-9 mm long; _ pedicels 7-11 mm long in fruit. [T. carteri]

Tragia affinis Rob. & Greenm. Proc. Amer. Acad. Sci. 29: 393. 1894.

Oak and pine forests or temperate deciduous forests, 1000-1700 m.

Jal. (Barranca of Guadalajara, Pringle 5474, GH, the holotype), Mich., Méx., Mor.

Jal., Mpio. Autlán, Las Juntas (Cuevas 1472, IBUG; Cuevas 1584, WIS); El Maloaste (Machuca 4328, GUADA); Cerro Alto Las Yeguas, 1 km S of Manantlán (Cochrane 10802, WIS); Mpio. Tecalitlán, Puente San Pedro (McVaugh 18104); Mich., Mpio. Uruapan, Cerro de Carboneras,

22 km S of Uruapan (King & Soderstrom 4912, TEX).

Twining vine from woody taproot, to 1.5-2 m high; leaves broadly ovate to reniform, 2-14.5 cm long, 1-9 cm broad, acute to acuminate at the tip, cordate at base, with simple hairs on both faces and stinging hairs mainly on veins; margins serrate to crenate; petioles 0.5-3 cm long; stipules lanceolate, 3-4 mm long; inflorescence 7.5-12 cm long, eglandular, villose, female flowers 1 (2) at base, bracts trifid, lanceolate, 2.5-3.2 mm long, 15-20 male flowers distal, bracts narrowly lanceolate, 2-2.5 mm long; male pedicels 2-2.5 mm long, persistent base 0.5-3 mm long, sepals 3-4, lanceolate to ovate, 2-3 mm long, stamens 10-14, filaments fleshy, 0.5-1.2 mm long, connate at base; female pedicels 2-8 mm long becoming 6-14 mm long in fruit, sepals lanceolate, 2.5-4 mm long, styles united one half to two thirds, stigma smooth; fruit 10-14 mm long and 5-12 mm broad, columella 4-5 mm long; seeds ovoid, ca 5 mm long, mottled.

According to Urtecho (1996), Tragia affinis, by virtue of its large stamen number, is an isolated species within the Mexican species of sect. Tragia. Although the stamen number suggests a relationship with T. bailloniana Müll. Arg. in sect. Zuckertia, leaf and seed characters are closer with T. mexicana and (within our area) T. pacifica.

Tragia mcvaughii Urtecho, sp. nov.

Tropical deciduous forest, 100-900 m.

Son., Sin., Nay., Jal. (1 mi S Autlán, Wilbur & Wilbur 2477, MICH, the holotype), Mich., Mex., Gro., Pue., Oax.

Nay., Mpio. Nayar, 1-2 km NW of Jesús María (Flores 1746); Jal., Mpio. La Huerta, Rancho Cuixmala (Guadalupe Ayala 572, UCR; Lott 3654), Juan Gil (Lott & Atkinson 2639); Estación Chamela (Lott 514, 2179, 2325, 2690); Mpio. Tuxcacuesco, s of Zenzontla (Santana 3869, IBUG); Mpio. Tolimán, Barranca el Huizichi (Cházaro 7013, WIS).

Erect, decumbent, or twining from a woody taproot, stems with sparse simple and urticant hairs; leaves lanceolate to triangular-ovate, 1.7-8.5 cm long, 1-3.5 cm broad, acute at the apex, truncate to cordate at base, with scattered stinging hairs on upper surface and adaxial veins; margins serrate; petioles 0.7-3 cm long; stipules lanceolate, 2.5-3 mm long, densely pubescent with simple hairs and scattered stinging hairs; inflorescence 1-2 cm long, rachis with stipitate and sessile glands and long stinging hairs, female flower solitary at base, male flowers solitary at 3-60 distal nodes; bracts of female flowers lanceolate, 1-2 mm long, pubescent; bracts

of male flowers lanceolate, somewhat cucullate, 0.8-1 mm long; male pedicels 1-2.5 mm long, with spreading simple hairs, persistent base 0.25-1 mm long; sepals 3, reddish-green, lanceolate, ciliate, 0.7-1.5 mm long; stamens 3, introrse; filaments fleshy, 0.2-0.8 mm long; female pedicels 2-6 mm long in fruit; sepals ovate to lanceolate, ciliate, 0.8-2 mm long; styles united halfway, stigma undulate to subpapillose; capsule 3-4 mm long, 3-6 mm broad, occasionally monocarpic; columella 2-2.5 mm long; seeds subglobose, 2-2.5 mm in diameter, mottled, with ridge cells in pairs.

The type collection of this species was noted by McVaugh (1961) as distinctive and somewhat resembling Tragia yucatanensis Millsp. According to Urtecho (1996), T. mcvaughii is best characterized by the combination of the unusual seed coat microsculpturing and the petiolar glands.

Tragia nepetifolia Cav. Icon. 6: 37, t. 557 fig. 1. 1801.

This is the most widespread and variable species of Tragia in Mexico. As treated by Urtecho (1996), there are four varieties, of which two (possibly three) occur in our area. The typical variety nepetifolia, reported from Guanajuato, may be found within our area.

Stems erect, decumbent, or twining; leaves ovate to linear, 1-8

cm long, 0.3-2 cm broad, acute to acuminate, subcordate to distinctly cordate and sometimes somewhat hastate, with stinging hairs on abaxial face; margins dentate to serrate; petioles mostly 1-15 (-35) mm long; stipules lanceolate, 2-5 mm long; inflorescences 1-2 (-3) cm long, rachis villose, sometimes with stinging hairs, lacking stipitate glands, female flower solitary, bracts lanceolate (sometimes somewhat lobed), 1-3 mm long, 10-20 male flowers with bracts lanceolate, subcucullate, 1-2 mm long; male pedicels 0.2-1.5 mm long, persistent base 0.1-0.5 mm long; sepals 3 (4), ovate or obovate, 1-2 mm long, stamens 3 (4), filaments fleshy, 0.2-0.5 (-0.7) mm long, connate at base; female pedicels 0.5-2 mm long in flower, 1.5-3.3 mm long in fruit, sepals 6, lanceolate to oblanceolate, sometimes gland-tipped, 1.5-3.5 mm long, styles united one third to one half, distinctly papillate; fruit ca 6-9 mm broad, columella 2-3 mm long; seeds subglobose, 2-2.5 mm long, brown and often mottled.

1. Upper leaves very long and narrow (linear); fruits 7-9 mm broad; seeds 2.8-3.5 mm broad. var. setosa

1. Upper leaves triangular to lanceolate or ovate; fruits 6-7 mm broad; seeds 2-2.5 mm broad.

2. Petioles 9-36 mm long; plants erect with flexuous tips, leaves pale green; oak woodlands. var. virens

2. Petioles 1-17 mm long; plants erect and microphyllous or twining; leaves dark green tinted red, densely urticating; cactus scrub and deciduous forest. [var. nepetifolia]

Tragia nepetifolia var. **nepetifolia**. Tragia nepetifolia var. genuina Müll. Arg., DC. Prodr. 15(2): 933. 1866.

Dry woodland or cactus scrub, Nuevo León and Coahuila south to Puebla, type from Hidalgo ("inter Ixmiquilpan et Cimpan", Nee, MA, photograph). This variety has not yet been recorded from our area; however, since it has been collected in the vicinity of the city of Guanajuato, it may well be encountered in adjacent Jalisco or Zacatecas.

Tragia nepetifolia var. **setosa** S. Wats. Proc. Amer. Acad. 22: 451. 1887.

Oak woods and deciduous woods, sometimes in barrancas, 750-1400 m.

Sin., Nay., Jal. (Río Blanco, Palmer 65, GH, the lectotype), Mich., Gro., Méx, S.L.P.; Guatemala.

Nay., Mpio. Acaponeta, 2-3 km from Mesa de Pedro y Pablo towards

San Blasito (Téllez & Salinas 12074, DAV); Mpio. Nayar, Mesa del Nayar to Santa Teresa (Breedlove & Almeda 45477, CAS), 4 mi E of La Ciénaga (Norris & Taranto 14265); Mpio. Jalisco, 15 km SE of Tepic (Urtecho & Biele 1050, DAV); Mpio. Compostela, 4-5 mi N of Compostela (McVaugh 19343); Mpio. Santa Maria del Oro, 22-23 mi SE of Tepic (McVaugh 18690), 35 km SE of Tepic (Rzedowski 14301, MEXU); Jal., Mpio. Zapopan, 17 km Guadalajara towards San Cristóbal de la Barranca (Santana 2736, XAL, WIS); Mpio. Autlán, 13 mi SSW of Autlán (Wilbur & Wilbur 2353); Mpio. Cuautitlán (1-2 km NE of Cuautitlán, Guzman & Santana 752, IBUG); Mpio. Tecalitlán, Puente San Pedro (McVaugh 16018); Mich., Mpio. Los Reyes, "Encinar Atapan" (Labat 936, P).

Stems 2-5 dm high, flexuous but never twining; leaves (upper) linear to narrowly ovate or (lower) triangular-ovate, 2.5-6 cm long, 0.4-1 cm broad; petioles 1-4 mm long; stipules lanceolate, 2.2-4 mm long, hirsute; inflorescence with 15-20 male flowers; male pedicel 0.8-1.5 mm long, persistent base 0.1-0.4 mm long; female pedicel 0.9-1.2 mm long in flower, 2-3 mm long in fruit; sepals 6, ovate, 2-2.5 mm long; styles united halfway; seeds subglobose, 2.8-3.5 mm long.

Most of the Nueva Galicia records of Tragia nepetifolia represent var. setosa. Variety setosa differs from the other varieties recognized by Urtecho (1996) in the character combination

of greenish or yellowish _ flowers, linear upper leaves, and larger seeds.

Tragia nepetifolia var. **virens** Urtecho, ined.

Oak-pine forests or transition zones with matorral, 1800-2500 m.

Chih., Zac., Gto., Ags., Jal., Mich., Méx. (oak grassland 0.7 mi E of Nicolás Romero (Urtecho 1015, DAV, the holotype), Qro., D.F., Hgo., S.L.P., Coah.

Ags., Mpio. Rincón de Romos, 4 km E of San José de Gracia (Rzedowski & McVaugh 727); Mpio. Calvillo, 40 km W of Aguascalientes (McVaugh 18305); Zac., 18 mi S of Valparaíso (McVaugh 17685).

Stems to 0.5 m high, decumbent to erect but never twining; leaves ovate to triangular or reniform, 1-4.5 cm long, 0.6-3 cm broad; petioles 9-36 mm long; stipules lanceolate, 2-5 mm long, ciliate; inflorescence with 10-25 male flowers; female pedicels 0.5-2 mm long in flower, 1.5-3.3 mm long in fruit; sepals oblanceolate, 2-3.5 mm long; styles united ca one third, stigma very papillate; seeds subglobose, ca 2-2.5 mm long.

In contrast to the other varieties of Tragia nepetifolia, var. virens is found in relatively mesic habitats at higher elevations, and is less pubescent.

Tragia pacifica McVaugh, Brittonia 13: 203, fig. 35. 1961.

Deciduous forest, palm forest, 0-1000 m.

Sin., Nay., Jal., Col. (15 mi SE of Manzanillo, McVaugh & Koelz 1624, MICH, the holotype), Mich., Oax., Chis.

Jal., Mpio. Tomatlán, 10 km S of Tomatlán (Urtecho 1053, DAV); 20 km SE of Tomatlán (McVaugh 25259, 25315); Mpio. Cihuatlán, 10 mi W of Cihuatlán (Webster & Breckon 16068, DAV); between Barra Navidad and Tenacatita (McVaugh 21006); Col., 15 mi SE of Manzanillo (McVaugh & Koelz 1624); Col., Mpio. Manzanillo, 15 mi SE of Manzanillo (McVaugh & Koelz 1624); Mich., Mpio. Aquila, La Ticula (Guerrero 606, XAL).

Twining vine to 2.5 m long; stems pubescent and with urticant hairs; leaves ovate or triangular-ovate, 4-8 (-13) cm long, 2-5 (-8) cm broad, acute or often acuminate at the apex, cordate at base, margins dentate; petioles 1.5-4 (-7) cm long; stipules triangular, to 1 mm long; inflorescences slender, 3-7 cm long, rachis densely

covered with stinging hairs and stipitate glands, female flower solitary at base, male flowers 15-50; male pedicels 3-4 mm long, articulated in the middle; sepals 3; stamens 3; female pedicel 1.5-2.5 mm long, becoming 3-4 mm long in fruit; sepals linear-lanceolate, 1.5-2.5 mm long (to 3 mm in fruit); styles connate into a column 1.5 mm long, branches ca 1 mm long, recurved, scarcely papillose; capsules 3-lobed, 7-8 mm broad, aculeate with glandular projections; columella 2 mm long; seeds globose, ca 2.8 mm broad, mottled.

As noted by Urtecho (1996), Tragia pacifica is unique among the Mexican species in its complex glandular ovarian trichomes. It resembles T. mcvaughii in its petiolar glands and glandular inflorescences.

Tragia volubilis L. Sp. Pl. 2: 980. 1753.

Semievergreen to evergreen forest, 0-1200 m.

Nay., Jal., Col., Tmps., VC., Tab., Chis., Yuc., Q.R.; C. Amer.; W. Ind. (Jamaica, Herb. Linn. 1103-1 (LINN), the lectotype); S. Amer. to Argentina.

Nay., 2 mi E of San Blas (Ferris 5508, CAS); Jal., Mpio. Talpa

de Allende, 2.5-4 mi N of La Cuesta (McVaugh 21189); Col., Manzanillo (Ferris 6221, CAS).

Climbing or trailing vine to 4 m; stem tips hirsute; leaves oblong to triangular-ovate, 1.5-10 cm long, 0.5-4 cm broad, acute to acuminate at the tip, acute to truncate or shallowly cordate at base, with simple hairs above and urticant hairs on abaxial veins; margins serrate; petiole 0.5-4 cm long; stipules narrowly lanceolate, 2-4.5 mm long, ciliate; inflorescences 1-2.5 cm long, puberulent, without stipitate glands, with a single basal female flower, male flowers 15-25; female bracts lanceolate, 3-lobed, 1-1.8 mm long; male bracts ovate, subcucullate, 1-2 mm long; male pedicels 1.5-4 mm long, persistent base 0.5-1.2 mm long; sepals 3, obovate, 0.9-1.5 mm long; stamens 2 (3), filaments fleshy, 0.3-0.8 mm long, connate at base, pistillode present; female pedicels 1.5-3.5 mm, increasing to 20-45 mm long in fruit; sepals 6, lanceolate, 2-2.5 mm long; ovary 2-horned on each locule; styles united up to halfway, stigmas undulate; capsules 7-8 mm broad, densely covered with urticant hairs; columella ca 2 mm long; seeds subglobose, 2.2-3 mm in diameter, with dark ridge cells.

Among our species, Tragia volubilis is easily identified by its very long female pedicel and its lack of glandular pubescence; the seeds also have a distinctive microsculpturing. There are some

rather striking differences in leaf shape, but Urtecho (1996) regards these as without taxonomic significance. It is striking that this widespread species is so uncommon and sporadic in Nueva Galicia.