

SIMAROUBACEAE

by

A. L. STOFFERS

(Instituut voor Systematische Plantkunde, Utrecht)

Trees or shrubs. Leaves alternate, pinnately compound or simple, often crowded at the top of the branches, without pellucid dots (but sometimes resin ducts in wood and bark). Stipules usually wanting. Inflorescence consisting of axillary clusters, racemes, panicles or cymose spikes. Flowers actinomorphic, unisexual by abortion and then the plant mostly dioecious or flowers hermaphrodite. Sepals 3—8, connate or sometimes free, imbricate or valvate. Petals 3—8 or rarely absent, free or basally connate. Stamens as many or twice as many as the petals, obdiplostemonous, inserted on or at the base of a disk; filaments distinct, often appendaged by scales at the base; anthers 2-celled, with longitudinal dehiscence. Staminodes often present in the female flowers. Gynoecium of 2—5(—8) unilocular and 1-carpellary pistils, distinct or the pistils basally connate into a lobed, 2—8-locular ovary or apically connate by the styles, rarely completely connate; styles 2—8, distinct or connate or sometimes absent. Ovules 1—2 in each carpel, with axile placentation. Fruit various, a capsule, schizocarp or samara, rarely a berry or a drupe. Seeds usually one. Embryo straight or curved. Endosperm scanty or wanting.

About 200 species in perhaps more than 30 genera in the tropics.

Key to the genera:

1. Leaves simple..... 2
Leaves pinnately compound..... 3
2. Shrub unarmed; flowers yellow, hermaphrodite..... *Suriana*
Shrub armed by skin spines; flowers reddish, unisexual..... *Castela*
3. Carpels united, styles 2—3, spreading; leaflets 5—9; inflorescence opposite the leaves..... *Picramnia*
Carpels free but joined at the top by the connate styles; leaflets 7—13; inflorescence axillary..... *Picrasma*

Suriana Linnaeus, Spec. Plant. 284. 1753

Shrubs; branches terete, covered with simple and capitellate hairs. Leaves alternate, clustered, thick and simple, covered by simple and capitellate hairs. Stipules wanting.

Inflorescence consisting of subterminal or axillary few-flowered racemes or flowers solitary. Bracts and bracteoles large. Flowers hermaphrodite, obdiplostemonous. Sepals 5, basally connate, imbricate, persistent. Petals 5, as long as the sepals, imbricate. Stamens 10, hypogynous, the epipetalous shorter or staminodial; filaments subulate and flattened at the base; anthers versatile, apically and basally emarginate, introrse. Disk inconspicuous. Gynoecium consisting of 5 free carpels, hairy; styles springing from near the base, filiform, glabrous; stigma small, capitate. Ovules 2 in each carpel, ascending from near the base, anatropous. Fruits 3—5, drupaceous, globose or subglobose, hairy, indehiscent, 1-seeded, surrounded by the persistent calyx. Seed ascending; endocarp hard and brittle. Embryo horseshoe-shaped. Endosperm scanty or wanting.

A monotypic genus of tropical seashores.

***Suriana maritima* L.**

LINNAEUS, *Spec. Plant.* 284. 1753; GRISEBACH, *Fl. Br. W. Ind. Isl.* 58. 1859 ['1864']; DUSS, *Fl. phan. Ant. franç.* 48. 1897; URBAN, *Symb. Ant.* 4: 321. 1905; BOLDINGH, *Fl. D.W. Ind. Isl.* 1: 102. 1909; JOHNSTON, *Proc. Bost. Soc. Nat. Hist.* 34(7): 226. 1909; BOLDINGH, *Fl. Ned. W. Ind. Eil.* 234. 1913; *Fl. D.W. Ind. Isl.* 2: 47. 1914; URBAN, *Symb. Ant.* 8: 325. 1920; BRITTON & MILLSAUGH, *Bahama Fl.* 209. 1920; FAWCETT & RENDLE, *Fl. Jamaica* 4(2): 196, fig. 62. 1920; BRITTON & WILSON, *Sci. Surv. Porto Rico & Virgin Isl.* 5: 458. 1924; QUESTEL, *Fl. Isl. St. Bartholomew* 131. 1941; LEON & ALAIN, *Fl. Cuba* 2: 400, fig. 160. 1951; ARNOLDO, *Zakflora* 71, fig. 26. 1954; *Zakflora* 195, fig. 26. 1964; ADAMS, *Flowering plants of Jamaica* 389. 1972; FOURNET, *Fl. Guadeloupe & Martinique* 1072, fig. 519, 519 bis. 1978.

Shrub, up to 2 (—2.5) m high; branches covered with greyish-brown to blackish-brown hairs. Leaves alternate and clustered especially near the top of the branches, subsessile or petiolate; blade linear-spathulate, acutish at the apex, tapering at the base, 1—3.5 × 0.3—0.7 cm; petioles up to 2.5 mm long. Flowers solitary or in short axillary racemes, more or less hidden by the leaves. Bracts and bracteoles linear-lanceolate, 3—4 mm long. Sepals ovate-lanceolate, acute and often mucronate at the apex, 7—9 × 2.5 mm. Petals rectangular-oblong to broadly obovate, erose at the apex, unguiculate at the base, 6—8 × 3—5 mm, yellow. Stamens 10; filaments up to 5 mm long, villose at the base; anthers 0.7—0.8 × 0.5—0.7 mm. Carpels ovate, villose with long hairs. Styles 5 mm long; stigma small. Ripe carpels globose to broadly obovoid, 4—5 mm long, densely brownish-pubescent.

Tropics.

Plants of salty habitats, along seashores and on saltflats.

ARUBA: calcareous seashore near Manshebo (Boldingh 6286, fl. & fr. Dec.); Boca Grandi (Stoffers 1390, fl. & fr. Jan.); Palm Beach (Stoffers 1793, fl. & fr. Jan.); Pova Beach (Stoffers 1412, fl. & fr. Jan.).

BONAIRE: neighbourhood of Rincón (Boldingh 7182, fr. Jan.); near Willemstoren (Stoffers 471, fl. & fr. Oct.); Lac (Stoffers 940, fl. & fr. Dec.); dunes south of Lac (Stoffers 982, fl. Dec.); between Witte Pan and Blauwe Pan (Burgers 522, fl. & fr. March); road to salt-pans near Pekelmeer (Stoffers 722, fl. Nov.).

CURAÇAO: coral seabeach near Willemstad (Britton & Shafer 2931, fl. March; Heldring - Talma s.n., fr.); Rif (Arnoldo 1990, fr. March); seashore near salt-pans near St. Willebrordus (Stoffers 358, fl. & fr. Oct.).

ST. EUSTATIUS: without loc. (Boldingh 379, fl. & fr. June).

ST. MARTIN: Point at Simson Bay (Arnoldo 1278, fl. & fr. March); without loc. (Boldingh 3043, st. Aug.; 1643, fl. & fr.).

Castela Turpin, Ann. Mus. Natl. Hist. Nat. Paris 7: 78, t. 5. 1806 nom. cons. 4118

Strongly branched shrubs; branches often spiny. Leaves alternate, small, simple, entire, thick. Flowers small, solitary or in few-flowered clusters in the leaf-axils, polygamous and the plant monoecious or dioecious. Sepals 4, small, basally connate, persistent. Petals 4, much larger than the sepals, deciduous. Male flowers: stamens 8, equaling the petals in length; filaments subulate or stout; anthers oblong to ovoid. Female flowers: staminodes 8; ovary 4-carpellary, cohering at the apex; styles wanting, short or elongate, free or united; stigma capitate or elongate; ovules one in each carpel. Drupes 1—4, small, more or less compressed, obovate, slightly oblique. Endocarp hard and brittle. Endosperm scanty or wanting.

About 12 species in warm-temperate and tropical America.

Castela erecta Turp.

TURPIN, Ann. Mus. Hist. Nat. Paris 7: 80, t. 5B. 1806; ARNOLDO, Zakflora 49. 1954; Zakflora 195. 1964; — *Castela nicholsoni* HOOKER, in Nicholson, Bot. Misc. 1: 271. 1830; — *Castelaria nicholsoni* SMALL, N. Amer. Fl. 25: 231. 1911.

Strongly branched, small shrub, provided with stemspines; twigs conspicuously white or grey-tomentose. Leaves sessile or subsessile; blades elliptic-oblong, slightly ovate or obovate, acute, obtuse or rounded at the apex and often mucronate, cuneate or rounded at the base, 0.5—1.5 × 0.2—0.5 mm, coriaceous, shiny above, white or grey-tomentose beneath, veins rather evident beneath, tomentose. Flowers solitary or in few-flowered clusters; pedicels short. Sepals ovate-triangular, about 1 × 1 mm, connate at the base. Petals broadly ovate to obovate, 2.5—3 × 2—5 mm, reddish, purplish or yellow. Male flowers: stamens 8; filaments stout, 1—1.3 mm long, villose at the base; anthers minute, oblong, cordate at the base, 1.5—1.7 mm long. Disk 8-lobed. Female flowers: staminodes 1 mm long; gynoeceium 4-carpellary, cohering at the apex; style wanting; stigmas elongate, 1 mm long. Drupes red, up to 1 cm long, compressed, slightly reticulate.

Known from northern Colombia and Venezuela, Marguerita, Antigua, St. Croix, Anguilla, Aruba, and Curaçao.

In Aruba and Curaçao known from calcareous plateaus only.

ARUBA: along road in Oranjestad (Stoffers 2117, st. Feb.).

CURAÇAO: road to Soto (Stoffers 125, fr. Sept.); Kleine Berg (Arnoldo 1191, fr. Oct.; id. 1117, fl. & fr. Aug.).

Picrasma Blume, Bijdr. Fl. Ned. Ind. 247. 1825

Trees, containing a bitter sap; branches spreading. Leaves alternate, crowded at the end of the branches, imparipinnate; leaflets few to several, opposite, entire or rarely toothed, short-petiolate. Inflorescence consisting of many-flowered, axillary corymbs. Flowers polygamous. Sepals 4—5, small, nearly free, imbricate. Petals 4—5, much longer

than the sepals, in the female flowers larger than in the male flowers, free, imbricate, at length deciduous. Stamens 4—5, episealous, inserted at the base of the disk; filaments slender, pubescent; anthers short, with longitudinal dehiscence by lateral slits. Gynoecium of 2—5 free ovaries; styles more or less united; stigmas free, introrse. Ovules solitary in each carpel, basal, nearly sessile. Drupes 1—5, globose or obovoid, 1-seeded. Endocarp hard and brittle. Endosperm wanting.

Five species, natives of tropical America

Picrasma antillana (Eggers) Urban

URBAN, *Symb. Ant.* 5: 378. 1908; BOLDINGH, *Fl. D.W. Ind. Isl.* 1: 102. 1909; *Fl. Ned. W. Ind. Eil.* 234. 1913; GOODING *et al.*, *Fl. Barbados* 231. 1965; FOURNET, *Fl. Guadeloupe & Martinique* 1068. 1978; — *Rhus antillana* EGGERS, *Bull. U.S. Nat. Mus.* 13: 41. 1879; — *Aeschrion antillana* (EGGERS) SMALL, *N. Amer. Fl.* 25: 233. 1911; BRITTON & WILSON, *Sci. Surv. Porto Rico & Virgin Isl.* 5: 460. 1924.

Evergreen tree, up to 10 m high; bark and sap bitter; twigs minutely pubescent, light brown with white lenticels. Leaves alternate, pinnate, 15—40 cm long; rachis sparingly pubescent; leaflets 7—13, oblong to ovate-oblong, 6.5—12 × 2.5—4.5 cm or ovate and smaller in the lower portion of the rachis, acuminate at the apex with a blunt tip, obtuse or rounded at the base, sparingly pubescent on the veins below and glabrous on the upper surface; petiolules 3—6 mm long; petiole 4.5—6 cm long. Inflorescence consisting of widely forking clusters, axillary; peduncle about 1.5 cm, pubescent. Flowers yellowish-green; pedicels 2 mm long, pubescent. Sepals 5, ovate, 1 × 0.5 mm, pubescent. Male flowers: petals 5, elliptic or slightly obovate, 2.3—3 × 1—1.3 mm, obtuse or acute and ciliate at the apex, slightly unguiculate at the base; stamens 5; filaments subulate, 3—3.5 mm long, villose in the lower half; anthers roundish, innate, cordate at the base, 0.7—0.9 mm long. Disk 5-lobed, fleshy. Female flowers: petals smaller than in the male flowers, minute; petals elliptic, 3 mm long; ovary 2—3-locular and -lobed; styles united; stigma 2—3-lobed. Drupes 1—3 in a flower, short-stipitate above the persistent petals and sepals, globose to globose-obovoid, 10—12 mm in diam., slightly fleshy, red, 1-seeded.

Virgin Islands and Lesser Antilles from St. Martin to St. Vincent and Barbados.

Rare tree in forests and woodlands above c. 200 m altitude.

Vernacular name: bitter ash (Windward Group).

SABA: Hellsgate (Boldingh 1687, st.); The Bottom (Boldingh 1849, st.); road from The Bottom to Mary's Point, 100—200 m (Boldingh 1465a, st.); near Hellsgate (Boldingh 1697a, fr.).

ST. EUSTATIUS: slope of The Quill, 400 m (Boldingh 279, st.); The Quill (Boldingh 461a, st.; 488 st.); near Bengalen (Boldingh 1189, st.); without loc. (van Groll-Meyer 210a, st.).

ST. MARTIN: Mount Paradise (Boldingh 3219, st.; 3327, st.).

Picramnia Swartz, *Prodr.* 2, 27. 1788 nom. cons. 4131

Trees or shrubs often containing a bitter sap. Leaves alternate, petiolate, imparipinnate; leaflets few, alternate or opposite, entire, petiolulate. Inflorescence consisting of

spreading or drooping spike-like or raceme-like panicles, opposite the leaves. Flowers unisexual, dioecious, small. Sepals 3—5, united at the very base, imbricate. Petals 3—5 or rarely wanting, imbricate. Male flowers: stamens 3—5, epipetalous, inserted between the lobes of the disk; filaments subulate, slender, without appendages; anthers broad, introrse; ovary wanting. Female flowers: staminodes 3—5, epipetalous; ovary 2—5-locular, sessile; styles wanting; stigmas 2 or 3, spreading; ovules 2 in each locule, pendulous. Fruit a berry, 1—2-locular, ovoid or globose, 1—2-seeded. Endosperm wanting.

About 40 species in tropical continental America and the West Indies.

***Picramnia pentandra* Sw.**

SWARTZ, Fl. Ind. Occ. 1: 220. 1797; GRISEBACH, Fl. Br. W. Ind. Isl. 140. 1859 [1864]; DUSS, Fl. phan. Ant. franç. 142. 1897; URBAN, Symb. Ant. 4: 322. 1905; BOLDINGH, Fl. D.W. Ind. Isl. 1: 103. 1909; Fl. Ned. W. Ind. Eil. 234. 1913; URBAN, Symb. Ant. 8: 327. 1920; FAWCETT & RENDLE, Fl. Jamaica 4(2): 203. 1920; BRITTON & MILLSPAUGH, Bahama Fl. 210. 1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 461. 1924; QUESTEL, Fl. Isl. St. Bartholomew 132. 1941; LEON & ALAIN, Fl. Cuba 2: 404. 1951; ADAMS, Flowering plants of Jamaica 391. 1972; FOURNET, Fl. Guadeloupe & Martinique 1069, fig. 517. 1978.

Evergreen, dioecious, small, slender tree or shrub, up to 6 m high; bark grey and smooth; twigs finely appressed-pubescent by greyish hairs. Leaves alternate, up to 30 cm long, the rachis green and reddish tinged, pubescent; petiole 4—6 cm long, pubescent; leaflets 5—9, ovate, oblong or elliptic, slightly inequilateral, acuminate, acute or obtuse at the apex, rounded or cuneate at the base, 3—12 × 1.5—6 cm, membranaceous to subcoriaceous, shiny above, finely appressed-pubescent when young; petiolules 2—3 mm long. Inflorescence consisting of clusters arranged into pendulous, loosely branched, yellow-pubescent panicles, up to 30 cm long. Male flowers: sepals 5, narrow to triangular-ovate; petals 5, linear-lanceolate, about as long as the sepals; stamens 5, about 3 mm long, anthers broad, less than 0.5 mm long. Female flowers: sepals ovate, acute at the apex, 1 mm long; petals 5, linear, somewhat longer than the sepals; staminodes present, minute; ovary 2—3-locular, styles and stigmas 2—3. Berries globose to oblong, ovoid or obovoid, 8—13 (—15) × 6—10 mm, reddish-brown, shining, smooth.

Southern Florida, Colombia and Venezuela; West Indies.

In forests and woodlands.

ST. MARTIN: Milldrum Hill, 300—400 m (Boldingh 3184, fl. & fr. Sept.); lower part of the hills between Mont Chambord and Mont Vernon (Boldingh 2956, fl. Aug.; 2962, fl. Aug.); mountain between Mont des Accords and Sentry Hill, 200—300 m (Boldingh 2878, fl. Aug.); Mount Paradise, 150—400 m (Boldingh 3197, fr. Sept.; 3345, fr. Sept.); id., 100—200 m (Boldingh 3299, fl. Sept.; Le Gallo 897, fl. July); Naked Boy Hill, 50—200 m (Boldingh 2714, st. Aug.; 2690, st. Aug.; 2697, fl. Aug.); top of the hills along northern side of Cul de Sac, 200—300 m (Boldingh 3010, fr. Aug.); Fort St. Louis (Le Gallo 928, fr. July; 977, fr. July; 903, fr. July); hills along the western side of Cul de Sac, north of Sentry Hill (Stoffers 2591, fl. March); Marigot Hill to Marigot, 200—0 m (Boldingh 2639, fl. Aug.); Sentry Hill, 200 m (Stoffers 4533, st. Aug.; 4537, st. Aug.); without loc. (Boldingh 2690, fr.; 3621, fr.).