

RUTACEAE

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Shrubs or trees, glandular-dotted and often strongly scented. Leaves alternate or opposite, simple or compound, often crowded near the top of the branchlets. Stipules wanting. Inflorescence various. Flowers hermaphrodite or unisexual, actinomorphic. Perianth typically biseriata, imbricate or valvate. Sepals 3—5, free or connate. Petals 3—5 or wanting, free or rarely connate. Stamens 3 to numerous, usually twice as many as the petals, basically in 2 rows, obdiplostemonous, sometimes staminodial; filaments attached at the base or the rim of the disk; anthers 2-celled, introrse, with longitudinal dehiscence; connective often with glandular apex. Disk present between stamens and gynoecium. Ovary superior, 5—4- or 3—1- or many-locular, carpels often free at the base and connate by the style or stigma only; styles as many as the carpels, rarely terminal, usually attached at the base or ventral side of the carpels, free, connate or wanting; stigmas free or connate. Ovules 1 to several in each locule, collateral or superposed. Fruit various. Seeds sessile or pendulous from the funicle. Embryo large, straight or curved. Endosperm present or wanting.

About 1500 species in c. 140 genera in temperate and tropical regions, but mainly in the tropics.

Key to the genera:

1. Leaves simple (unifoliolate)..... 2
Leaves compound..... 4
2. Petiole winged or rarely not winged; stamens 15 or more..... *Citrus*
Petiole not winged; stamens 3—8..... 3
3. Branches and trunk with pyramidal, sharp-pointed prickles, up to 1 cm long;
leafblade cuneate to roundish at the base..... *Zanthoxylum monophylla*
Branches and trunk spineless; leafblade cordate at the base.....
.....*Amyris simplicifolia*
4. Leaves 2-foliolate..... *Pilocarpus*
Leaves 3—many-foliolate..... 5
5. Plants spineless..... 6
Plants provided with spines..... 7

- 6. Flowers unisexual; leaflets (3—) 5—11, obtuse, acutish or retuse at the apex
..... *Zanthoxylum flavum*
Flowers hermaphrodite; leaflets 3—5, acute to long-acuminate at the apex
..... *Amyris elemifera*
- 7. Leaves 3-foliolate; spines 1 or 2 in the axils of the leaves..... *Triphasia*
Leaves many-foliolate..... *Zanthoxylum*

Zanthoxylum Linnaeus, Spec. Plant. 270. 1753

Deciduous or evergreen trees or shrubs; branches and leaves often armed with prickles. Leaves alternate, simple or compound and then the leaflets opposite or alternate. Inflorescence consisting of axillary or terminal cymes, panicles, racemes or clusters. Flowers hermaphrodite or unisexual, dioecious or polygamous. Sepals 3—5 more or less connate, persistent or rarely deciduous, imbricate. Petals 3—5, imbricate or valvate. Male flowers: stamens 3—5, episepalous, hypogynous; filaments subulate; anthers ovate or ovate-oblong; pistil rudimentary. Female flowers: staminodes wanting or scale-like; carpels 1—5; styles sublateral, free or united; stigmas free or capitate and then 2—5-lobed. Ovules 2 in each locule, pendulous from the inner angle of the locule. Carpels separating in fruit, opening by the ventral suture, endocarp loose or adherent. Seed 1 in each locule, pendulous, black. Embryo straight or curved. Endosperm fleshy.

Over 200 species in tropical regions.

Key to the species:

- 1. Leaves uni-foliolate..... *Z. monophyllum*
Leaves compound..... 2
- 2. Petiole and rhachis winged..... *Z. spinifex*
Petiole wingless..... 3
- 3. Plant without spines..... *Z. flavum*
Plant provided with spines..... 4
- 4. Sepals and petals 3; carpels 2..... *Z. punctatum*
Sepals and petals 5; carpels 5..... *Z. martinicensis*

Zanthoxylum monophyllum (Lam.) P. Wilson

P. WILSON, Bull. Torrey Bot. Club 37: 86. 1910; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 450. 1924; WILLIAMS, Fl. Trinidad & Tobago 1: 147. 1929; FOURNET, Fl. Guadeloupe & Martinique 1057, fig. 511. 1978; — *Fagara monophylla* LAMARCK, Tab. Encycl. 1: 334. 1792; URBAN, Symb. Ant. 4: 317. 1905; BOLDINGH, Fl. Ned. W. Ind. Eil. 231. 1913; Fl. D.W. Ind. Isl. 2: 46. 1914; URBAN, Symb. Ant. 8: 320. 1920; WILLIAMS, Fl. Trinidad & Tobago 1: 500. 1947; ARNOLDO, Zakflora 23. 1954; Zakflora 190. 1964; GOODING *et al.*, Fl. Barbados 228. 1965.

Shrub or tree, up to 8 m tall; bark greyish; stem and branches armed with pyramidal sharp-pointed prickles up to 1 cm long. Leaves alternate, unifoliolate; leaflets elliptic, oval or obovate, acute, acuminate or obtuse at the apex, cuneate or rounded at the base, often somewhat inequilateral, 5—13 × 3—6 cm, on sterile branches often much larger, margin entire or obscurely crenate, green and shining above, paler and rusty-tomentose beneath, pellucid-dotted; petiolule up to 8 mm long, tomentose. Inflorescence con-

sisting of terminal panicles up to 7 cm long, more or less hispidulous. Sepals 5 (or 4), ovate or ovate-oblong, 2—2.5 × 0.7-1.5 mm, white. Male flowers: stamens 5 (—4); filaments broadly subulate, 2 mm long; anthers versatile, ovate, deeply cordate at the base, 1 mm long. Female flowers: carpels 2—3, subsessile; styles short; stigma somewhat capitate. Cocci globose to obovoid-globose, 3.5—6 mm long, black, shining.

Antilles, Costa Rica, and northern South America.

In dry woodlands, especially on limestone.

Vernacular names: bosua, kaubati (Leeward Group).

BONAIRE: Soebi Rincón: (Boldingh 7266, fr.); Rincón (Boldingh 7048, st.); Rooi Sangu near Dos Pos (Arnoldo 448, st. Feb.).

CURAÇAO: Seroe Christoffel at the side of Knip Plantation (Arnoldo 1096, flb. Sept.); St. Hieronymus Berg (Arnoldo s.n., fr. Dec.); hills between St. Hieronymo and Savonet (Boldingh 5078, fr.); hills near Siberië (Boldingh 5189, st.; 5263, fr.); hills from Klein Santa Marta to Dokterstuin (Boldingh 5634, fr.); from Anthony Berg to northern seashore (Boldingh 5118, fr.); Christoffel chiquito (Stoffers 6247, fl. Dec.).

Zanthoxylum spinifex (Jacq.) DC.

DE CANDOLLE, Prodr. 1: 728. 1824; QUESTEL, Fl. Isl. St. Bartholomew 129. 1941; LEON & ALAIN, Fl. Cuba 2: 386. 1951; FOURNET, Fl. Guadeloupe & Martinique 1057, fig. 512. 1978; — *Fagara spinifex* JACQUIN, Fragm. Bot. 10, t. 6, fig. 2. 1800; URBAN, Symb. Ant. 4: 318. 1905; BOLDINGH, Fl. D.W. Ind. Isl. 1: 100. 1909; Fl. Ned. W. Ind. Eil. 232. 1913; URBAN, Symb. Ant. 8: 321. 1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 450. 1924; QUESTEL, Fl. Isl. St. Bartholomew 129. 1941; GOODING *et al.*, Fl. Barbados 228. 1965; ADAMS, Flowering plants of Jamaica 384. 1972.

Deciduous shrub or small tree, up to 5 m tall; bark greyish to greyish-brown; branches flexuous, almost always armed with slender, brownish, stipular spines, 2—5 mm long; young twigs minutely puberulent, glabrescent in age. Leaves alternate, imparipinnate; petiole winged, 1—1.5 cm long; rachis winged, rarely with an occasional spine between the leaflets; leaflets opposite, 3—11, sessile or short-petiolate; blade linear-oblong, ovate, elliptic or obovate, rounded, truncate or emarginate at the apex, cuneate or slightly rounded at the base, 0.4—1.5 × 0.2—0.6 cm, lustrous above, paler beneath, margin obscurely crenate with 2 glands at the base beneath, pellucid dots wanting or sometimes one present at the apex. Inflorescence consisting of axillary, sessile, few-flowered clusters or flowers solitary. Sepals 4, triangular, 0.5 × 0.7 cm. Petals 4, ovate to elliptic, 1.5—2 × 0.7—0.9 mm. Male flowers: stamens 4; filaments longer than the petals, c. 3 mm long; anthers ovate to suborbicular. Female flowers: gynophore entire, short, 4-grooved, semiglobose; carpels 2; styles long-persistent; stigmas connate. Cocci 1—2, sessile or short-stipitate, united below, globose to ovoid-globose, 2.5—3.5 mm in diam., obtusely keeled on one side, mucronate, brownish or blackish. Seeds ovoid or subglobose, 2.5—3 mm long, black, shining.

Cuba, Jamaica, Puerto Rico to Barbados, and Venezuela.

In woodlands and forests.

ST. MARTIN: Mount Paradise, 100—200 m (Boldingh 3296, st. Sept.); between Mount Vernon and Orient Bay (Boldingh 2928, st. Aug.); from Belvedere to Oyster Pond (Boldingh 3062, st. Aug.); gut from Bethlehem to Cul de Sac, 100—200 m (Boldingh 3425, fr. Sept.); Vineyard Hill (Stoffers 4512, st. Aug.); Prince Quarter (Suringar s.n., fl. May [L]).

Zanthoxylum flavum Vahl

VAHL, *Eclog. Amer.* 3: 48. 1807; DUSS, *Fl. phan. Ant. franç.* 140. 1897; BRITTON & MILLSAUGH, *Bahama Fl.* 207. 1920; BRITTON & WILSON, *Sci. Surv. Porto Rico & Virgin Isl.* 5: 452. 1924; LEON & ALAIN, *Fl. Cuba* 2: 387, fig. 156. 1951; FOURNET, *Fl. Guadeloupe & Martinique* 1058. 1978; — *Fagara flava* (VAHL) KRUG & URBAN in ENGLER, *Bot. Jahrb.* 21: 571. 1896; URBAN, *Symb. Ant.* 4: 317. 1905; BOLDINGH, *Fl. D.W. Ind. Isl.* 1: 100. 1909; *Fl. Ned. W. Ind. Eil.* 231. 1913; *Fl. D.W. Ind. Isl.* 2: 46. 1914; URBAN, *Symb. Ant.* 8: 320. 1920; FAWCETT & RENDLE, *Fl. Jamaica* 4(2): 173, fig. 56. 1920; ARNOLDO, *Zakflora* 26. 1954; *Zakflora* 190. 1964; ADAMS, *Flowering plants of Jamaica* 385. 1972.

Evergreen, unarmed, dioecious tree or shrub, up to 13 m high; bark smooth, grey; twigs finely stellate-pubescent, becoming glabrous. Leaves alternate, crowded at the top of the twigs, imparipinnate, stellate-pubescent when young; petiole 4—8 cm; leaflets (3—) 5—11, opposite, sessile or nearly so; blade oblong, ovate, lanceolate or elliptic-oblong, obtuse, acutish or retuse at the apex, roundish, subtruncate or acutish at the base, 3—10 × 2—5.5 cm, inequilateral, margin crenate or entire, slightly recurved, pellucid-dotted. Inflorescence consisting of terminal, many-flowered panicles, up to 15 cm long; pedicels and rachis stellate-pubescent; pedicels 1—4 mm long. Sepals 4—5, triangular, 0.5 mm long, open in the bud, stellate-pubescent. Petals 4—5, elliptic-lanceolate or oblong-ovate, 2.5—4 × 1—2 mm, greenish-white, reflexed in age, glandular. Male flowers: stamens 4—5; filaments subulate-filiform, 3 mm long; anthers versatile, ovate to ovate-oblong, cordate at the base. Female flowers: carpels 1—3; style short. Cocci obovoid to globose, 5—9 mm long, brown. Seeds obovoid, 4—5 × 3—4 mm, black, shining.

Florida, Bermuda, and West Indies south to St. Lucia.

Rare; mainly in the calcareous area.

Vernacular names: kalabari (Leeward Group)
yellow saunder (Windward Group).

BONAIRE: Seroe Largoe (Arnoldo 354, fr. Jan.); calcareous plateau of Klein Bonaire (Boldingh 7487, st. Feb.; 7494, male fl. Feb.; 7495, st. Feb.); without loc. (Boldingh 7328, fr.; 7324, st.).

ST. MARTIN: Tintamarre (Boldingh 3376, fr. Sept.).

Zanthoxylum punctatum Vahl

VAHL in WEST, *Bidr. St. Croix* 310. 1793; BRITTON & WILSON, *Sci. Surv. Porto Rico & Virgin Isl.* 5: 449. 1924; QUESTEL, *Fl. Isl. St. Bartholomew* 128. 1941; FOURNET, *Fl. Guadeloupe & Martinique* 1057, fig. 513, 1978; — *Fagara trifoliata* SWARTZ, *Prodr.* 33. 1788; URBAN, *Symb. Ant.* 4: 318. 1905; BOLDINGH, *Fl. D.W. Ind. Isl.* 1: 101. 1909; *Fl. Ned. W. Ind. Eil.* 232. 1913; URBAN, *Symb. Ant.* 8: 321. 1920; GOODING *et al.*, *Fl. Barbados* 229. 1965; WILLIAMS, *Fl. Trinidad & Tobago* 1: 500. 1947; ADAMS, *Flowering plants of Jamaica* 386. 1972; — *Zanthoxylum trifoliatum* WRIGHT, *Mem.* 240. 1828 non L.; FAWCETT & RENDLE, *Fl. Jamaica* 4(2): 177. 1920.

Deciduous shrub or small tree, up to 6 m tall; flowering branches and their leaves usually without prickles, sterile branches with petioles, rhachis and midrib of leaflets armed with slender, straight, brown prickles beneath. Leaves alternate, imparipinnate or rarely paripinnate; leaflets opposite, (2—) 3 (—7) or on sterile branches up to 21, obovate-elliptic to elliptic-lanceolate, rounded, acute, short-acuminate, retuse or emarginate at the apex, acute to cuneate and inequilateral at the base, 2.5—8 × 1—4 cm, lustrous above, paler beneath, margin obscurely crenulate; with black glandular dots and sometimes with pellucid dots beneath; rhachis grooved; petiolules 2—3 mm long; petioles up to 6 cm long, grooved. Inflorescence consisting of short, axillary clusters, racemes or panicles; pedicels short. Sepals 3, triangular-ovate to semi-orbicular, 0.4—0.6 mm long, entire or denticulate. Petals 3, elliptic to orbicular-ovate, 1.7—2.5 × 1.0—1.9 mm, white or yellowish-white. Male flowers: stamens 3; filaments slightly longer than the petals; anthers ovate to orbicular. Female flowers: carpels 2, partly united at the base; style short; stigma small. Cocci 2—1, globose or subglobose, 3.5—4.5 × 3—4 mm, apiculate, surface more or less glandular-tuberculate or glandular-impressed. Seeds 1 in each coccus, globose to reniform, 3—3.5 × 2—2.5 mm, black, shiny.

Antilles excepted Cuba.

In woodlands.

ST. MARTIN: lower part of the hills between Mont Chambord and Mont Vernon (Boldingh 2953, st. Aug.); Point Blanche (George s.n. sub Boldingh 2492, st. Aug.); between Belvedere and Oyster Pond (Boldingh 3082, fr. Aug.; 3074, fl. Aug.; 3081, fr. Aug.; 3056, st. Aug.); Naked Boy Hill, 50—200 m (Boldingh 2708, st. Aug.); hills along northern side of Cul de Sac, 75—100 m (Stoffers 2605, st. March; 2622, st. March).

ST. EUSTATIUS: top of The Quill, 400 m (Boldingh 204, st. June; Stoffers 3925, st. July).

Zanthoxylum martinicensis (Lam.) DC.

DECADOLLE, Prodr. 1: 726. 1824; DUSS, Fl. phan. Ant. franç. 141. 1897; WILLIAMS, Fl. Trinidad & Tobago 1: 148. 1929; LEON & ALAIN, Fl. Cuba 2: 383. 1951; FOURNET, Fl. Guadeloupe & Martinique 1061. 1978; — *Fagara martinicense* LAMARCK, Tab. Encycl. 1: 334. 1792; URBAN, Symb. Ant. 4: 316. 1905; BOLDINGH, Fl. D.W. Ind. Isl. 1: 100. 1909; Fl. Ned. W. Ind. Eil. 231. 1913; URBAN, Symb. Ant. 8: 320. 1920; FAWCETT & RENDLE, Fl. Jamaica 4(2): 172. 1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 451. 1924; WILLIAMS, Fl. Trinidad & Tobago 1: 500. 1947; ADAMS, Flowering plants of Jamaica 385. 1972.

Dioecious tree, up to 20 m tall; bark greyish; stems bearing stout pyramidal or conical, corky spiny knobs up to 5 cm long and wide; branches and twigs hispidulous, with or without straight or slightly curved, brown-yellowish, 2—5 mm long prickles. Leaves alternate, imparipinnate or rarely paripinnate, up to 35 cm long; petioles 5—10 cm long; petiole and rhachis with or without brown prickles, hispidulous, terete or somewhat angled; leaflets 5—13 (—29), opposite or alternate, sessile or subsessile, oblong, oblong-lanceolate, obovate or elliptic, rounded, obtuse, acute or emarginate at the apex, obliquely rounded or acute at the base, 3—13 × 1.5—5 cm, inequilateral, mem-

branaceous, glossy and hispidulous especially on the midvein above, paler and hispidulous on the veins beneath; the midvein with or without prickles. Inflorescence consisting of terminal and axillary panicles up to 15 cm long. Flowers subsessile. Sepals 5, triangular to triangular-ovate, rounded or acute at the apex, 0.5 mm long, open in the bud, membranaceous. Petals 5, ovate or elliptic-ovate, 1.5—3 × 1—1.5 mm, white. Male flowers: stamens 5; filaments slender, 2—4 mm long; anthers ovate. Female flowers: carpels 5; style very short; stigma peltate, usually 5-lobed. Cocci 2—5, more or less united below, sessile, 4—5 mm long, obliquely ovate to orbicular, glandular-dotted. Seeds ovoid, 3—4 mm long, black, shiny.

Antilles and tropical South America.

Vernacular name: yellow prickle (Windward Group).

SABA: Windwardside (Boldingh 1942, st. July); The Mountain near Hellsgate, 600 m (Boldingh 2279, st. July); id., near Windwardside, 400—475 m (Stoffers 3343, st. May).

ST. EUSTATIUS: top of The Quill, 400 m (Boldingh 190, st., seedling); The Quill (Boldingh 461, st.); slope of The Quill, near Glass Bottle, 275-340 m (Stoffers 3835, st. July).

ST. MARTIN: along road in Cul de Sac (Boldingh 2989, fr. Aug.).

Pilocarpus Vahl, *Eclog.* 1: 29, t. 10. [1797] 1796

Shrubs or small trees. Leaves alternate to verticillate by crowding at the top of the branches, simple or compound. Inflorescence consisting of terminal or axillary, elongated racemes; pedicels spreading in flower, ascending in fruit. Bracts and bracteoles present. Flowers hermaphrodite, 5-merous. Calyx short, 5-lobed or -toothed. Petals reflexed, deciduous when flowering, coriaceous, valvate or slightly imbricate. Stamens 5; filaments deciduous, accumbent in shallow grooves of the disk; anthers dorsifixed, versatile. Disk annular to somewhat cup-shaped, completely adnate to the ovary. Carpels 5, not immersed, frequently borne on a globose gynophore, connate at the base, free in the upper part; style short; stigma 5-lobed. Ovules 1 or 2 per carpel. Fruit divided into 5 mericarps of which 1—4 often rudimentary, united at the base only, mussel-shaped, concentrically ridged, splitting above the middle into 2 valves. Seeds solitary in each mericarp, kidney-shaped.

Thirteen species, from Mexico to Argentine.

Pilocarpus goudotianus Tulasne

TULASNE, *Ann. Sci. Nat. Bot. Sér.* 3. 7: 284. 1847 (as "goudotiana"); KAASTRA, *Fl. Neotropica* 33: 160. 1982.

Small shrub or treelet, up to 4 m tall; branchlets dull-greyish or reddish-brown. Leaves alternate, usually crowded at the top of the branchlets, 5—1-foliolate; petiole strongly ribbed, slightly winged or wingless, (2—) 4—6 cm long; leaflets elliptic, subovate, oblong or rarely obovate, rounded or obtuse at the apex, with the very top emarginate, rounded to cuneate at the base, lateral leaflets inequilateral at the base, 4—12 × 1—4 cm, coriaceous, pellucid-dotted; petiolules up to 3 mm long. Inflorescence consisting

of many-flowered, subterminal racemes, up to 30 cm long and 3—6 cm wide, peduncle wanting or obsolete; rhachis densely pubescent with thin spreading hairs. Bracts broadly triangular, 0.7—1 × 1 mm; pedicels inserted at 60—90 degrees; bracteoles 2, inserted just below the calyx. Calyx 5-toothed or -lobed, its tube 0.5 mm long; lobes ovate, nearly 1 mm long. Petals 5, oblong to oblong-ovate, 3.5—5 × 2—3 mm, coriaceous, keeled, apex acute and curved-inwards. Stamens 5; filaments adnate to the base of the disk, subulate, 3—3.5 mm long, glabrous; anthers ovoid, c. 1.5 mm long, pale yellowish. Disk glabrous. Carpels adnate to the disk, 1 mm high, punctate; style inserted among the tips of the carpels; stigma capitate. Mericarps obovate or subelliptic, 9—13 × 17—20 mm, glabrous or short-hairy near the tip, the sterile mericarps usually hairy at the tip. Seeds one per mericarp, kidney-shaped, 5—8 mm long, rounded and slightly keeled on the back, black-brown, shining.

subsp. *goudotianus*
var. *goudotianus*

KAASTRA, Fl. Neotropica 33: 161, fig. 52 A-D. 1982; — *Pilocarpus racemosus* Auct. non Vahl; BOLDINGH, Fl. Ned. W. Ind. Eil. 232. 1913; Fl. D.W. Ind. Isl. 2: 46. 1914; ARNOLDO, Zakflora 58. 1954; Zakflora 190, 1964.

Leaflets subcoriaceous, pubescent on both sides with spreading thin hairs 0.2—0.4 mm long, more densely pubescent at the base and on the midvein or becoming subglabrous. Racemes 3—3.5 (—4) cm wide; pedicels (3—) 10—16 mm long, in fruit ascending and 12—25 mm long; petals 3.5—4.5 × 2—2.7 mm.

Colombia, Venezuela, Aruba, and Curaçao.

Rare; in shrub-vegetations especially in limestone area.

Vernacular names: burachi, palu cayente (Leeward Group).

ARUBA: calcareous rocks near Fontein (Arnoldo 231, fl. & fr. Dec.; Boldingh 6481, st. Jan.; Stoffers 6259, fl. & fr. Feb.); Palu Marca (Stoffers 1745, fl. & fr. Jan.).

CURAÇAO: without loc. (Arnoldo 97, st. March).

Amyris P. Browne, Civ. Nat. Hist. Jamaica 208. 1756

Resinous trees or shrubs, glabrous or nearly so. Leaves alternate or opposite, imparipinnate; leaflets 1—3 or more, with numerous pellucid dots. Inflorescence consisting of axillary or terminal, many-flowered panicles; pedicels bibracteolate. Flowers small, often 3 together, hermaphrodite or unisexual, polygamous or dioecious. Calyx urceolate, (3—) 4-toothed, persistent. Petals (3—) 4, spreading, imbricate. Stamens twice as many as the petals, inserted at the base of the disk; filaments filiform; anthers with longitudinal dehiscence. Ovary unilocular, sessile or stipitate; style short or wanting; stigma capitate or flat. Ovules 2, pendulous. Drupe small, globose or ellipsoid; exocarp fleshy; endocarp chartaceous, 1-seeded. Seed pendulous; seedcoat membranaceous. Endosperm wanting.

About 20 species in the West Indies and tropical continental America from Texas to Colombia and Ecuador.

Key to the species:

1. Leaves 3—5-foliolate..... *A. elemifera*
Leaves unifoliolate..... *A. simplicifolia*

***Amyris elemifera* L.**

LINNAEUS, Syst. Nat. ed. 10. 1000. 1759; URBAN, Symb. Ant. 4: 319. 1905; BOLDINGH, Fl. D.W. Ind. Isl. 1: 101. 1909; Fl. Ned. W. Ind. Eil. 232. 1913; URBAN, Symb. Ant. 8: 233. 1920; BRITTON & MILLSAUGH, Bahama Fl. 208. 1920; FAWCETT & RENDLE, Fl. Jamaica 4(2): 191, fig. 60. 1920; BRITTON & WILSON, Sci. Surv. Porto Rico & Virgin Isl. 5: 453. 1924; WILLIAMS, Fl. Trinidad & Tobago 1: 150. 1929; QUESTEL, Fl. Isl. St. Bartholomew 129. 1941; LEON & ALAIN, Fl. Cuba 2: 393. 1951; ADAMS, Flowering plants of Jamaica 388. 1972; FOURNET, Fl. Guadeloupe & Martinique 1062. 1978.

Evergreen shrub or tree, up to 5 m tall with a dense rounded crown of compact pale green foliage; trunk to 12 cm in diam.; bark smooth, grey, becoming rough with deep furrows and rectangular plates. Leaves opposite or subopposite, 3—5-foliolate; leaflets lanceolate to broadly ovate, roundish or rhombic-ovate, acute to long-acuminate at the apex, cuneate, rounded or subtruncate at the base, usually 3—6 × 1.5—4 cm, coriaceous, margin crenulate or entire; petiolules of the terminal leaflets up to 1.5 cm long, those of the lateral ones about 0.5 cm long; petioles 1.5—4 cm long. Flowers hermaphrodite, usually 3 together. Calyx 0.5 mm long, its lobes ovate to triangular, 0.5 mm long. Petals 4, obovate to obovate-elliptic, 1.2—3.5 × 1.5—2.5 mm, glandular-dotted. Stamens 8; filaments 1 mm long; anthers 0.7 mm long, sagittate at the base. Gynophore wanting. Ovary 1-locular, glabrous; style wanting; stigma broad-capitate. Drupe globose or occasionally ovoid or obovoid, 5—8 (—10) mm long, covered with a bloom, glandular-dotted, with thin flesh. Seed 1, brown.

Florida, West Indies, and Central America.

In woodlands.

ST. MARTIN: Mount William, 100 m (Stoffers 2537, fl. March); Tintamarre (Boldingh 3391, st. Sept.; 3395, st. Sept.); Low Lands (Arnoldo 3432, fl. & fr. Jan.).

***Amyris simplicifolia* Karst.**

KARSTEN, Fl. Columbiae 2: 109. 1865; BOLDINGH, Fl. Ned. W. Ind. Eil. 233. 1913; Fl. D.W. Ind. Isl. 2: 46. 1914; WILLIAMS, Fl. Trinidad & Tobago 1: 149. 1929; ARNOLDO, Zakflora 80. 1954; Zakflora 190. 1964.

High shrub, often tree-like. Leaves alternate, the upper ones sometimes subopposite, unifoliolate; leaflet ovate to narrowly ovate or elliptic, 2—9 × 1.6—6 cm, obtusely and shortly acuminate at the apex, subtruncate, roundish or cuneate at the base, margin very slightly crenulate, with pellucid dots; petiolule 1—3 mm long; petiole 1—1.5 cm long. Inflorescence consisting of terminal and axillary, many-flowered panicles. Calyx tube 0.5 mm long, the lobes 0.5 mm long, triangular to orbicular. Petals 4, white, oblong

to obovate, 3 × 2 mm, glandular-dotted. Stamens 8; filaments of the outer row 2 mm long, those of the inner row 1—1.5 mm long, filiform to subulate; anthers 1 mm long, sagittate at the base. Gynophore well-developed. Ovary ovoid, glabrous; style short; stigma capitate. Drupe globose, 5 mm in diam.

Northern South America, Trinidad, Curaçao, and Bonaire.

Mainly in the calcareous area.

BONAIRE: calcareous plateau of Montagne (Boldingh 7390, fl. buds. Feb.; Stoffers 880, fl. buds, Dec.).

CURAÇAO: hills near Rooi Behoenda (Boldingh 5523, st. Nov.); calcareous rocks near Siberië (Arnoldo 1064, fl. buds, June).

Triphasia Loureiro, Fl. Cochinchina 152. 1790

Evergreen shrubs; branches mostly spiny. Leaves alternate, 3- to 1-foliolate, coriaceous, pellucid-dotted; lateral leaflets smaller than the terminal one. Inflorescence consisting of few-flowered cymes or flowers solitary. Flowers hermaphrodite. Calyx cup-shaped, 3—4-lobed. Petals 3 or 4, imbricate. Stamens 6, inserted at the base of a fleshy disk; filaments free, subulate, dilated to the base; anthers linear to oblong, with longitudinal dehiscence. Ovary sessile, obovate, 3(—4)-celled; style slender, deciduous; stigma obtuse or capitate, 3—4-lobed. Ovules solitary in each locule. Fruit a berry, 1—3-locular. Seeds 1—3, oval or subglobose; testa fleshy. Embryo straight. Endosperm wanting.

Two species, native of Asia; one species cultivated and naturalized in all tropical regions.

Triphasia trifolia (Burm. f.) P. Wilson

P. WILSON, *Torreyia* 9: 33. 1909; URBAN, *Symb. Ant.* 8: 324. 1920; FAWCETT & RENDLE, *Fl. Jamaica* 4(2): 183. 1920; BRITTON & WILSON, *Sci. Surv. Porto Rico & Virgin Isl.* 5: 454. 1924; QUESTEL, *Fl. Isl. St. Bartholomew* 130. 1941; LEON & ALAIN, *Fl. Cuba* 2: 395. 1951; ARNOLDO, *Gekw. en nutt. pl. Ned. Ant.* 135, fig. 205. 1954; *Gekw. en nutt. pl. Ned. Ant.* 231. 1971; GOODING *et al.*, *Fl. Barbados* 230. 1965; ADAMS, *Flowering plants of Jamaica* 383. 1972; FOURNET, *Fl. Guadeloupe & Martinique* 1062, fig. 515. 1978; — *Triphasia trifoliata* (L.) DE CANDOLLE, *Prodr.* 1: 536. 1824; GRISEBACH, *Fl. Br. W. Ind. Isl.* 132. 1859 [‘1864’]; BOLDINGH, *Fl. D.W. Ind. Isl.* 1: 101. 1909; *Fl. Ned. W. Ind. Eil.* 233. 1913; *Fl. D.W. Ind. Isl.* 2: 47. 1914.

Evergreen shrub or small tree, up to 5 m tall; branches puberulent when young; spines in pairs in the axils of the leaves, up to 2 cm long, slender, straight. Leaves petiolate, 3-foliolate; terminal leaflet ovate to oval, obtuse or rounded and emarginate at the apex, cuneate at the base, 2—5 × 1—4 cm, margin crenulate; petiolule 2—4 mm long; lateral leaflets ovate to oval or suborbicular, obtuse or rounded and emarginate at the apex, rounded or cuneate at the base, 1—3.5 × 1—2.5 cm, margin crenulate; petiolules 1 mm long; petiole 2—5 mm long, puberulent. Inflorescence consisting of few-flowered cymes; peduncle short. Flowers white, fragrant. Calyx puberulent, its tube 0.5 mm long, its lobes broadly triangular, 1 × 1.5 mm, ciliate. Petals linear-oblong, 1—1.5 × 0.5 cm. Stamens 6; filaments 4 mm long; anthers 3 × 1 mm, cordate at the base. Disk

0.5—0.75 mm high. Ovary obovoid; style stout, 3—4 mm long; stigma capitate, 3-lobed. Berry ovoid to globose, 1—1.5 cm in diam., red, aromatic, marked with glandular pits. Seeds blackish.

Native of Asia; cultivated and naturalised in all tropical countries.

Cultivated in Aruba, Bonaire and Curaçao, also naturalized in Saba, St. Eustatius, and St. Martin.

Vernacular names: lamunchi surinam, lamunchi shimarón (Leeward Group)
myrtle lemon, sweet lemon (Windward Group).

ARUBA: Fontein Plantation (Suringar s.n., flb. & fr. Feb. [L]).

CURAÇAO: Groot Kwartier (Suringar s.n., flb. & fr. Feb. [L]); Brakkeput (Suringar s.n., fl. & fr. Jan. [L]); Veeris Berg (Suringar s.n., fr. Jan. [L]).

SABA: The Bottom (Boldingh 1856, fr. July; Arnoldo 910, fr. Aug.; Stoffers 2912, fr. Ap.; 3285, fr. May).

ST. EUSTATIUS: in garden in Oranjestad (Boldingh 538, fl. June); Bengalen (Boldingh 613, fr. June); along road from Oranjestad to Fort de Windt (Stoffers 3489, st. July); without loc. (van Groll-Meyer 226, st.).

ST. MARTIN: hills along eastern side of Cul de Sac (Boldingh 3447, st. Sept.); Cul de Sac to Marigot Hill, 0—200 m (Boldingh 2622, st. Aug.); road to Pointe Blanche (Arnoldo 1224, fr. March); hills along the northern side of Cul de Sac, 0—50 m (Stoffers 2643, fr. Ap.).

Citrus Linnaeus, Spec. Plant. 782. 1753

Evergreen shrubs or small trees with distinctive spicy odour and taste of crushed parts; twigs green, mostly with sharp brown-tipped, green spines, 0.5—2.5 cm long. Leaves alternate, uni-foliolate, petiolate; blades mostly elliptic with numerous tiny gland-dots, visible against the light, margin with minute, rounded teeth; petioles usually winged. Flowers solitary or in few-flowered clusters. Sepals 4—6. Petals 4—6, white, somewhat fleshy, gland-dotted. Stamens 15 or more. Ovary 8—15-locular. Ovules 1—several in each locule. Fruit a berry or hesperidium, green when young, becoming yellow or orange-coloured, composed of an aromatic peel enclosing 8—15 locules (“sections”) with large juicy vesicular cells and few to many whitish seeds.

Tropics; several species native of southern Asia are grown in our islands.

Key to the species:

1. Petioles wingless, not apparently articulated with the blade. Spiny shrub or treelet; leaf-blades 8—20 × 3—9 cm; flowers 5-merous; petals pinkish; stamens 30—40; fruit oblong, 10—20 cm; peel very thick, yellow; vernacular name: *citroen* (Aruba, Curaçao)..... *C. medica* L.
Petioles distinctly articulated with the blade, usually winged 2

2. Petioles narrowly margined but not winged; flowers tinged with purple without. Spiny tree, 3—6 m tall; leaf-blade 5—10 × 3—6 cm; flowers 4—5-merous; stamens 20—40; fruit ovoid with terminal nipple, 5—10 cm long; peel rough and smooth. Native of S.E. Asia; escaped from cultivation and naturalized on Saba (Mountain)..... *C. limon* (L.) Burm. f. Petioles broadly or narrowly winged; flower-buds white..... 3
3. Twigs pubescent; petioles broadly winged; flowers mostly 4-merous, large; fruit 10—30 cm in diam; pulp-vesicles easily separated. Spiny tree, 5—15 m tall; leaf-blade 5—20 × 2—12 cm; fruit pyriform, globose or oblate, weighing up to 2 Kg or more. Native of S.E. Asia; vernacular name: *pompelmoes* (Curaçao)..... *C. maxima* (J. Burm.) Merrill Twigs glabrous or nearly so; flowers 4—5-merous; fruit smaller; pulpvesicles cohering..... 4
4. Petiole usually broadly winged; fruit spherical; moderately spiny trees; stamens 19—25..... 5
Petiole usually narrowly winged..... 6
5. Fruit 8—15 cm in diam., rather smooth, maturing light-yellow. Tree, 4—10 m tall; leaf-blade up to 14 × 10 cm. Probably originated in cultivation in the West Indies; vernacular name: *grapefruit* (Curaçao)..... *C. paradisi* Macf. Fruit 7—9 cm in diam., rather rough, maturing light-orange. Tree to 10 m tall; leaf-blade up to 20 × 7 cm. Native of S.E. Asia; vernacular name: *laraha* (Aruba, Curaçao). Dried peels are used for preparing the famous “Curaçao liquor”..... *C. aurantium* L.
6. Fruit with loose peel, oblate, 5—6 cm in diam. Small tree with spines mainly on inner branches; leaf-blades 4—8 (—9.5) × 1.5—4 (—5.5) cm; stamens 15—20. Native of China; vernacular name: *mandarijntje* (Aruba, Curaçao)..... *C. reticulata*
Fruit with adherent peel; stamens 20—25..... 7
7. Fruit ovoid to subglobose, light yellow when ripe, pulp greenish and very acid, mostly 3.5—5 cm in diam. Shrub or tree, 2—5 m tall, with numerous spines; leaf-blades 4—7 (—8) × 2—4 (—5) cm. Native of tropical Asia; vernacular names: *lamunchi*, *lemmetje*, *lime* (Aruba, Bonaire, Curaçao, Saba, St. Eustatius, and St. Martin)..... *C. aurantifolia*
Fruit subglobose, greenish-yellow to orange when ripe, pulp yellow or orange, sweet, mostly 5—10 cm in diam. Tree, 4—12 m tall with rather few spines; leaf-blade 5—15 × 2—8 cm. Native of China; vernacular name: *appelsina*. *orange*. *sinaasappel*, *sweet orange* (Aruba, Curaçao)..... *C. sinensis*