1. **ZANTHOXYLUM** Linnaeus, Sp. Pl. 1: 270. 1753.

花椒属 **hua jiao shu**

Zhang Dianxiang (张奠湘); Thomas G. Hartley

Shrubs sometimes scrambling, trees, or woody climbers, evergreen or deciduous, dioecious, rarely monoecious or polygamo-monoecious [or monoclinous], usually armed [or exclusively unarmed]. Leaves alternate, odd-pinnately 3- to many foliolate or sometimes digitately 3-foliolate (occasional leaves even-pinnate, 2-foliolate, or 1-foliolate). Inflorescences terminal, axillary, or basal to leaves, paniculate, thyrsiform, racemose, or umbelliform. Perianth in 2 series and differentiated with 4 or 5 sepals and 4 or 5 petals or grading to 1 series and undifferentiated with 5–9 tepals. Sepals distinct or basally connate. Petals valvate or imbricate in bud. Stamens distinct, 4 or 5 in plants with sepals and petals, 3–8(–10) in plants with tepals, rudimentary or lacking in female flowers. Disk flattened, pulvinate, or columnar. Gynoecium 1–5-carpelled, rudimentary or lacking in male flowers; ovaries basally connate, otherwise ± contiguous or distinct, 1-loculed; ovules 2 per locule. Styles in compound gynoecium apical or subapical, coherent or contiguous to spreading-ascending or recurved; stigmas capitulate, coherent or distinct. Style in simple gynoecium off-centered, erect or variously curved or bent; stigma capitulate or peltate. Fruit follicles 1–5, distinct or basally connate, apex often with a stylar beak; abortive carpels, if any, often persistent. Seeds globose to ovoid, persistent in dehisced fruit; seed coat with a thick or rarely ± thin inner layer of dense black sclerenchyma and spongy-fleshy outer layer bounded externally by a shiny black or reddish pellicle; endosperm copious or rarely scant; embryo straight or ± curved; cotyledons ± orbicular to broadly elliptic, flattened or rarely plano-convex; hypocotyl superior.

Two hundred or more species: pantropical and extending to temperate latitudes in E Asia and E North America; 41 species (25 endemic) in China.

1a. Perianth in 2 irregular series or 1 series, with 5–9 ± undifferentiated tepals; stamens in male flowers 4–8(–10).
1b. Perianth in 2 series, with 4 or 5 sepals and 4 or 5 petals; stamens in male flowers 4 or 5.

2a. Gynoecium in female flowers 1(or 2)-carpelled and leaf rachises not winged but canaliculate with sides of channel rarely slightly spreading at apex of rachis ................................................................. 32. **Z. wutaiense**
2b. Gynoecium in female flowers 2–5-carpelled or if 1-carpelled then leaf rachises with wing to 6 mm wide on each side.

3a. Fruit follicles stipitate.
3b. Fruit follicles not stipitate.

4a. Leaflet blades 0.7–1.3 cm wide ................................................................. 41. **Z. stipitatum**
4b. Leaflet blades usually at least 1.5 cm wide.

5a. Leaves 3–5(–11)-foliolate; follicles apically shortly beaked .......................................................... 29. **Z. dimorphophyllum**
5b. Leaves 5–15-foliolate; follicles not apically beaked ................................................................. 40. **Z. simulans**

6a. Leaf rachises usually conspicuously winged.
6b. Leaf rachises not conspicuously winged but sometimes with a distinct margin.

7a. Wings of leaf rachis extending to as much as 3 mm on each side; secondary veins of leaflet blades evident, 10–28 on each side of midvein; anthers in male flowers reddish purple prior to anthesis; gynoecium in female flowers 2–5-carpelled ................................................................. 30. **Z. acanthopodium**
7b. Wings of leaf rachis extending to as much as 6 mm on each side; secondary veins of leaflet blades generally faint especially adaxially, 7–15 on each side of midvein; anthers in male flowers yellow prior to anthesis; gynoecium in female flowers 1–3-carpelled ................................................................. 31. **Z. armatum**

8a. Fruit follicles pubescent; branchlets covered with setiform prickles and compressed pseudostipular prickles decurrent along branchlet and forming a wing joining them between nodes .......................................... 39. **Z. pteracanthum**
8b. Fruit follicles glabrous; branchlets without compressed pseudostipular prickles joined by a wing.

9a. Leaflet blades to 3 × 1.5 cm.
9b. Leaflet blades usually larger than 3 × 1.5 cm.

10a. Leaflet blades reddish brown to blackish brown when dry ........................................ 37. **Z. piasezkii**
10b. Leaflet blades grayish green to yellowish green when dry ........................................ 38. **Z. pilosulum**

11a. Leaf near inflorescence on fertile branchlet 3-foliolate, with terminal leaflet 4–6 cm wide .......... 36. **Z. motuoense**
11b. Leaf near inflorescence on fertile branchlet more than 5-foliolate, with terminal leaflet less than 3.5 cm wide.

12a. Leaf rachises terete, glabrous ................................................................. 35. **Z. austrosinense**
12b. Leaf rachises with a distinct margin or pubescent.

13a. Leaflet blades abaxially flocculent along midvein and adaxially glabrous or both surfaces pubescent ................................................................. 33. **Z. bungeanum**
13b. Leaflet blades abaxially glabrous and adaxially hirsutulous to sparsely puberulent .......... 34. **Z. undulatifolium**
14a. Flowers 5-merous; trees or rarely shrubs.
15a. Shrubs; leaflet blades rarely wider than 2 cm, adaxially with trichomes and abaxially glabrous .............. 28. *Z. schinizolium*
15b. Trees; leaflet blades wider than 2 cm, adaxially glabrous or both surfaces with trichomes.
16a. Fertile branchlets unarmed, with small pith; leaf rachises winged.
17a. Gynoecium in female flowers 2(3)-carpelled; leaflet blades asymmetric, oblique at base ................. 23. *Z. avicennae*
17b. Gynoecium in female flowers 3(4)-carpelled; leaflet blades at base rounded to broadly cuneate, symmetric or asymmetric .......................................................... 24. *Z. micranthum*
16b. Fertile branchlets armed, with large pith; leaf rachises not winged.
18a. Leaflet blades glabrous.
19a. Leaflet blades dark green to light yellowish green when dry, abaxially glaucous ................................... 25. *Z. ailanthoides*
19b. Leaflet blades reddish brown to blackish brown, abaxially not glaucous ............................................. 26. *Z. myricacanthum*
18b. Leaflet blades abaxially and/or adaxially with trichomes.
20a. Leaflet blades abaxially and adaxially with trichomes ................................................................. 26. *Z. myricacanthum*
20b. Leaflet blades abaxially with trichomes, otherwise glabrous.
21a. Leaflet blades abaxially with a soft woolly villous indumentum ......................................................... 27. *Z. molle*
21b. Leaflet blades abaxially pubescent ...................................................................................................... 25. *Z. ailanthoides*

14b. Flowers 4-merous; woody climbers, shrubs, or rarely trees.
22a. Gynoecium in female flowers 2-3-carpelled and styles usually recurved; follicles stipitate .......... 29. *Z. dimorphophyllum*
22b. Gynoecium in female flowers 1-carpelled or if 2–4-carpelled then styles usually erect to spreading-ascending; follicles not stipitate.
23a. Inflorescences terminal, cymose-corymbiform; pedicel at least 1 cm in fruit and purplish red like follicles.
24a. Fruit pedicel 1–1.5 cm, ca. 1 mm wide; leaflet blades with numerous oil glands, midvein adaxially impressed and puberulent, margin of blade serrulate .......................................................... 20. *Z. oxyphyllum*
24b. Fruit pedicel 1.5–4.5 cm, less than 1 mm wide; leaflet blades with inconspicuous oil glands, midvein adaxially ridged, plane, or impressed, margin of blade crenulate or entire toward base.
25a. Midvein on adaxial surface of leaflet blades ridged or plane toward apex, petiolules pubescent adaxially .................................................................................. 21. *Z. stenophyllum*
25b. Midvein on adaxial surface of leaflet blades impressed, petiolules glabrous ........................................ 22. *Z. esquirolii*
23b. Inflorescences axillary and terminal, thyrsiform; pedicel rarely to 1 cm in fruit and not purplish red.
26a. Fruit follicles with prickles and/or trichomes.
27a. Fruit follicles with prickles and trichomes ...................................................................................... 19. *Z. echinocarpum*
27b. Fruit follicles with trichomes, without prickles.
28a. Leaflets opposite; leaflet blades 7–19 × 5–8 cm .................................................................................. 17. *Z. collinsiae*
28b. Leaflets alternate to opposite; leaflet blades 6–8 × 2.5–3.5 cm ......................................................... 18. *Z. liboense*
26b. Fruit follicles with neither prickles nor trichomes.
29a. Fruit follicles 1–1.5 cm; outer part of pericarp (exocarp and mesocarp) wider than endocarp .............. 16. *Z. dissitum*
29b. Fruit follicles to 0.9 cm; outer part of pericarp not wider than endocarp.
30a. Leaflets opposite.
31a. Trees; leaflet blades asymmetric .................................................................................................. 3. *Z. integrifolium*
31b. Woody climbers or shrubs; leaflet blades symmetric.
32a. Leaflet blades abaxially without oil glands along secondary veins, apex retuse at tip; petiolules obsolete or to 5 mm .............................................................. 1. *Z. nitidum*
32b. Leaflet blades abaxially with oil glands along secondary veins, apex not retuse at tip; petiolules ca. 1 mm .......................................................................................................................... 2. *Z. xichouense*
30b. Leaflets alternate or partly opposite.
33a. Leaflet blades abaxially, leaf rachises, and inflorescences tomentulose .............................................. 4. *Z. tomentellum*
33b. Leaflet blades abaxially, leaf rachises, and inflorescences glabrous or puberulent.
34a. Leaves with numerous oil glands which project outward when dry.
35a. Fruit follicles not apically beaked; leaflet blade oil glands light yellow to brown when dry, pellucid .......................................................... 5. *Z. glomeratum*
35b. Fruit follicles usually apically beaked; leaflet blade oil glands brown or blackish brown when dry.
36a. Leaves 3- or 7(or 9)-foliolate; leaflet blades at least 5 cm, lustrous when dry ................................. 6. *Z. macranthum*
36b. Leaves 7–51-foliolate; leaflet blades barely to 5 cm, dull when dry.
37a. Leaves 7–15-foliolate; leaflet blades symmetric or subsymmetric, midvein adaxially impressed .................. 7. *Z. rhombifoliatum*
37b. Leaves 17–51-foliolate; leaflet blades asymmetric, midvein adaxially plane to ridged ....................................................................................................................... 13. *Z. multifljugum*
34b. Leaves with few oil glands or oil glands inconspicuous.

两面针 liang mian zhen

Shrubs, erect or scrambling, or sometimes woody climbers. Trunk winged. Stems, branchlets, and leaf rachises usually with prickles. Rachis of inflorescences and abaxial surface of leaflet blades glabrous or hirsutulous. Leaves (3 or)5–11-foliolate; petiolules obsolete or to 5 mm; leaflet blades opposite, broadly ovate, subcordate, elliptic, narrowly elliptic, or rarely ovate, 3–12 × 1.5–6–(8) cm, leathery, secondary and tertiary veins abaxially ridged when dry, margin crenate at least toward apex or entire, apex acuminate to caudate with a retuse tip. Inflorescences axillary. Flowers 4-merous. Perianth in 2 series. Sepals ca. 1 mm wide, apically purplish green. Petals pale yellowish green, ovate-elliptic to oblong, ca. 3 mm. Stamens in male flowers 5–6 mm; mature anthers ellipsoid to globose. Petals in female flowers broader than those in male flowers. Gynoecium in female flowers 4-carpelled; carpels globose. Styles stout, coherent at anthesis; stigma capitate. Fruit pedicel 2–5 mm; follicles reddish brown, (5–)5.5–7 mm in diam., apex beaked. Fl. Mar–May, fr. Sep–Nov or May.

Below 800 m. Fujian, Guangdong, Guangxi, S and SE Guizhou, Hainan, S Hunan, Taiwan, Yunnan, S Zhejiang [India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Nepal, New Guinea, Philippines, Thailand, Vietnam; Australia, SW Pacific islands].

1a. Leaflet rachises with straight prickles 5–10 mm ....................................................... 8. Z. leiboicum
1b. Leaflet rachises unarmed or with curved prickles rarely to 5 mm.

38a. Rachis of inflorescences and abaxial surface of leaflet blades glabrous. Petiolules 2–5 mm or leaflets subsessile; leaflet blades broadly ovate, subcordate, or narrowly elliptic, 1.5–6 cm wide, margin crenate or entire, apex acuminate with a retuse tip. Fruit follicles 5.5–7 mm in diam. Fr. Sep–Nov.

Below 800 m. Fujian, Guangdong, Guangxi, S and SE Guizhou, Hainan, S Hunan, Taiwan, Yunnan, S Zhejiang [India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar, Nepal, New Guinea, Philippines, Thailand, Vietnam; Australia, SW Pacific islands].

1b. Zanthoxylum nitidum var. tomentosum C. C. Huang, Guihaia 7: 5. 1987.

毛叶两面针 mao ye liang mian zhen

Rachis of inflorescences and abaxial surface of leaflet blades glabrous. Petiolules 1–3 mm; leaflet blades elliptic or rarely ovate, 3–5(–8) cm wide, margin revolute and entire or apically crenate, apex acuminate. Fruit follicles ca. 5 mm in diam. Fr. May.

● Hillside thickets. E Guangxi (Pingnan).


西畴花椒 xi chou hua jiao

Woody climbers, glabrous except for inflorescence rachises. Branchlets dark reddish purple when young, unarmed or spinose. Leaves 3–7-foliolate; petiolules ca. 1 mm; leaflet blades opposite, elliptic to obovate, 5–10 × 3–5 cm, thinly papery, oil glands inconspicuous, reticulate veinlets ridged when dry, base broadly cuneate, margin entire, apex acuminate. Inflorescences axillary. Pedicel 4–7 mm in fruit. Fruit follicles crimson, globose, ca. 5.5 mm in diam., apex beaked; exocarp, mesocarp, and endocarp thin. Seeds 4–4.5 mm in diam. Fr. Oct.

● Forests. 1400–1500 m. SE Yunnan (Xichou).


兰屿花椒 lan yu hua jiao

Fagara integrifolia Merrill, Philipp. J. Sci. 1(Suppl. 1): 68.
1906.

Trees 13–20 m tall. Branchlets prickly. Leaves (13–)17–25-foliolate; rachis unarmed; petiolules 5–7 mm; leaflet blades opposite, oblong to obovate, 1.5–2 × 0.6–0.8 cm, papery, glabrous, adaxially lustrous when dry, oil glands inconspicuous, midvein adaxially impressed, secondary veins adaxially ridged, base oblique, margin entire, apex cuspidate with a blunt tip. Inflorescences terminal or axillary, to 25 cm. Flowers 4-merous. Perianth in 2 series. Petals white, ca. 3 mm. Male flowers: stamens 4; rudimentary gynoecium shortly conic. Female flowers 1-carpelled. Fruit pedicel 3–5 mm; follicles pale yellow to pale yellowish green, ovate-elliptic, ca. 3 mm. Infructescences axillary, thyrsiform. Female flowers subsessile or with a pedicel to 1 mm, male flowers with a longer pedicel. Flowers 4-merous. Perianth in 2 series. Sepals purplish green. Petals pale yellowish green, broadly elliptic, ca. 3 mm. Male flowers: filaments ca. 4 mm; rudimentary gynoecium shortly club-shaped, apically 2-lobed. Female flowers: carpels 4. Infructescences 3–5 cm. Fruit pedicel 2–3 mm; follicles reddish brown, 5.6–6 mm in diam., with a flange, oil glands impressed, apex beaked. Seeds ca. 5 mm in diam. Fl. Apr–May, fr. Aug–Sep.

- Upland open forests and thickets; 500–3100 m. Chongqing (Nanchuan), Guizhou, SW Henan, W Hubei, Hunan, Sichuan (Emei Shan), S Yunnan (Xishuangbanna), SE Xizang.


菱叶花椒 ling ye hua jiao

Shrubs 1–2 m tall, erect, glabrous. Branchlets and leaf rachises unarmed or pricklely. Leaves 5–9-foliolate; petiolules 4–8 mm; leaflet blades alternate, lanceolate, long elliptic, or rarely ovate, 6–12 × 2.5–5 cm, thickly papery, oil glands numerous, reticulate veinlets abaxially inconspicuous and adaxially ridged, margin entire, apex acuminate to caudate with a rounded to retuse tip. Inflorescences axillary, thyrsiform. Female inflorescences 2–6 cm. Flowers 4-merous. Pedicel 1–2 mm. Perianth in 2 series. Petals pale yellowish green, ovate-elliptic, ca. 3 mm. Infrastructures globose to conic. Fruit pedicel 5–8 mm; follicles pale yellow to brownish yellow when dry, ca. 7 mm, oil glands impressed, apex not beaked. Seeds dark brown, ca. 6 mm in diam. Fl. Apr, fr. Sep.

- Upland open forests; ca. 1500 m. Guangxi (Damiao Shan), SE Guizhou (Rongjiang).


雷波花椒 lei bo hua jiao

Zanthoxylum calcicola C. C. Huang var. macrocarpum C. C. Huang.

Shrubs to 2 m tall, erect. Branchlets and leaf rachises
with prickles. Leaves 17–31-foliolate; petiolules 1–3 mm, puberulent; leaflet blades subopposite to alternate, broadly ovate to obovate with rounded or cuspidate apex, or ovate-obdeltoid with abrupt apex, 2–4 × 1.5–2.5 cm, thickly papery, oil glands inconspicuous, midvein impressed or apically plane, basally puberulent, margin acutely crenulate. Inflorescences axillary, subracemously cymose, 4–10 cm. Fruit pedicle 1–3 mm; follicles dark blackish brown when dry, 0.5–1.5 cm in diam., rugulose, oil glands inconspicuous, apex beaked. Seeds ca. 5 mm in diam. Fr. Jul.

- Thickets on dry hill slopes, river valleys; 400–1500 m. SW Sichuan.


拟蚬壳花椒 ni xian ke hua jiao

*Zanthoxylum dissitoides* C. C. Huang.

Woody climbers to 4 m tall. Trunk, branches, branchlets, and leaf racishes with prickles. Rachis of young leaves, petiolules, and midvein of leaflet blades puberulent. Leaves 5–13-foliolate; petiolules 2–6 mm; leaflet blades alternate, ovate, ovate-elliptic, or rarely oblong, 8–15 × 4–7 cm, adaxially lustrous, oil glands sparse, inconspicuous, and pellucid, midvein plane to adaxially impressed, secondary veins 9–14 on each side of midvein, base symmetric or rarely oblique, margin entire, apex acuminate. Inflorescences axillary. Flowers 4-merous. Pedicel ca. 4 mm. Perianth in 2 series. Sepals pale purplish green, narrowly ovate, to 1 mm. Petals yellowish green, broadly ovate, ca. 4 mm. Male flowers: filaments pale yellowish green, linear, 6–8 mm; rudimentary gynoecium terete, 4-lobed. Female flowers: staminodes shortly linear. Fruit pedicle 2–5 mm; follicles reddish brown with purplish red margin, 7–9 mm in diam., with a flange, oil glands impressed when dry, apex beaked. Seeds brownish black, subglobose, 6–7 mm in diam. Fl. Mar.–May, fr. Sep.–Dec.

- Moisit thickets and forests; 500–1300 m. Guangdong (Zhanjiang), SW Guangxi, Hainan, S Yunnan [N Vietnam].

10. **Zanthoxylum scandens** Blume, Bijdr. 249. 1825.

花椒簕 hua jiao le

*Fagara chinensis* Merrill; *F. cuspidata* (Champion ex Bentham) Engler; *F. cytorhachia* Hayata; *F. laxifoliatata* Hayata; *F. leiorthachia* Hayata; *F. scandens* (Blume) Engler; *Zanthoxylum chinense* (Merrill) Chung; *Z. cuspidatum* Champion ex Bentham; *Z. cytorhachia* (Hayata) C. C. Huang; *Z. laxifoliatata* (Hayata) C. C. Huang; *Z. leiorthachia* (Hayata) C. C. Huang.

Shrubs or woody climbers. Trunks, branches, branchlets, and leaf racishes with prickles. Leaves 5–25-foliolate; leaflet blades alternate or opposite on distal part of leaf rachis, ovate, ovate-elliptic, or obliquely oblong, 4–10 × 1.5–4 cm, both surfaces black or blackish brown when dry, axially lustrous, oil glands inconspicuous, midvein impressed and glutinous or plane and puberulent, base oblique to subsymmetric and obtuse to broadly cuneate, margin entire or apically crenulate, apex mucronate, caudate, cuspidate, or long acuminate with an obtuse to retuse tip. Inflorescences terminal or axillary. Flowers 4-merous. Perianth in 2 series. Sepals pale purplish green, broadly ovate, ca. 0.5 mm. Petals pale yellowish green, 2–3 mm. Male flowers: stamens 4, 3–4 mm; connective with an oil gland at apex; rudimentary gynoecium subtended by pulvinate disk, 2–4-lobed. Female flowers: carpels 3 or 4; staminodes ligulate. Fruit follicles purplish red, grayish brown to black when dry, 4.5–5.5 mm in diam., oil glands slightly protruding, plane, or impressed, apex beaked. Seeds subglobose, 4–5 mm in diam. Fl. Mar.–May, fr. Jul.–Aug. 2n = 68.

Lowland forests, open forests, thickets; near sea level to 1500 m. S Anhui, Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Indonesia, Japan (Ryukyu Islands), Malaysia, Myanmar].


广西花椒 guang xi hua jiao


Woodly climbers. Young branchlets, leaf racishes, and inflorescences pubescent. Branchlets unarmed. Leaves 5–9-foliolate; leaflet blades subopposite or rarely alternate, lanceolate, ovate, or oblanceolate, 4–10 × 2–3 cm, papery, midvein abaxially pubescent and adaxially impressed and puberulent, base broadly cuneate, margin subentire or apically crenate, apex mucronate to caudate. Inflorescences axillary or terminal, thyrsiform, 2–15 cm. Fruit pedicel 5–10 mm; follicles ca. 5 mm, apex beaked. Seeds subglobose, ca. 4 mm in diam.

- Hillside thickets and open forests; 600–700 m. Chongqing (Fengjie, Wushan), N Guangxi, S Guizhou (Libo).

Hartley (J. Arnold Arbor. 47: 177. 1966) placed *Fagara kwangsiensis* in synonymy of *Zanthoxylum scandens*. *Zanthoxylum kwangsiense* was inadvertently omitted.


云南花椒 yun nan hua jiao

*Zanthoxylum yunnanense* C. C. Huang.

Shrubs or trees, to 3 m tall. Branchlets gray, with prickles. Young branchlets, inflorescences, leaf racishes, and adaxial surface of leaflet blades with long grayish yellow trichomes. Leaves 5–13-foliolate; petiolules 4–10 mm, winged; leaflet blades alternate or rarely subopposite, ovate to elliptic, asymmetric, 3.5–9 × 2–4 cm, papery, midvein adaxially impressed, secondary veins 10–16 on each side of midvein, base cuneate, margin crenulate or apically crenate-serrulate, apex caudate. Inflorescences terminal or axillary, thyrsiform; bracts minute. Flowers 4-merous. Perianth in 2 series. Sepals ovate, ca. 0.5 mm, margin ciliolate. Petals long elliptic, 2–3 mm. Female flowers: staminodes ca. 1 mm. Fruit pedicle 7–10 mm, villous; follicles oblique, 5–6 mm, apex beaked. Fl. May, fr. Jul.–Aug.

Hillside thickets and open forests; 1500–2500 m. W Yunnan [India].

**多叶花椒** duo ye hua jiao

_Fagara mengtezana_ Hu; _F. multifuga_ (Franchet) Hu; _Zanthoxylum multifoliolatum_ Hemsley.

Woody climbers. Young branchlets pale reddish brown, glabrous. Stems, branches, and leaf rachises with prickles. Leaves 19–51-foliolate; leaflet blades subsessile, subopposite to alternate, lanceolate, elliptic, or ovate, asymmetric, 1.5–5 × 0.5–2 cm, oil glands numerous and pellucid, midvein puberulent when young and adaxially slightly ridged to plane, margin crenate, apex blunt, rounded, or mucronate with a blunt tip. Inflorescences axillary. Flowers 4(or 5)-merous. Perianth in 2 series. Sepals ovate, to 1 mm, apex blunt to rounded. Petals pale yellowish green, broadly ovate, ca. 2 mm. Male flowers: stamens 4; anthers broadly ovate; connective with an oil gland at apex; rudimentary gynoecium long conic. Female flowers: pedicel 2–5 mm, to 1 cm in fruit. Fruit follicles brownish red, ca. 5 mm in diam., apex beaked. Seeds 4–4.5 mm in diam. Fl. May–Jun, fr. Oct–Nov.

- Upland thickets and open forests; 1500–2200 m. Guizhou, C and N Yunnan.


**石山花椒** shi shan hua jiao

Shrubs or woody climbers, 2–3 m tall. Branchlets and leaf rachises with prickles. Branchlets lenticellate, puberulent. Leaves 9–31-foliolate; petiolules, leaf rachises adaxially, and leaflet blades adaxially on midvein puberulent to pubescent; petiolules 1–3 mm; leaflet blades lanceolate, obliquely oblong, or rarely ovate, 2.5 × 0.7–2.5 cm, oil glands inconspicuous, midvein adaxially plane or basally impressed, secondary and tertiary veins ridged on both surfaces, base rounded to broadly cuneate, margin entire, apex shortly caudate. Inflorescences terminal or axillary, thyrsiform, to 26 cm. Flowers 4-merous. Perianth in 2 series. Sepals purplish green, broadly ovate, ca. 1 mm. Petals oblong, 3–4 mm. Stamens 4; connective with an oil gland at apex. Infuctescences ca. 12 cm wide. Fruit follicles dark brownish black, ca. 6 mm in diam., oil glands inconspicuous, apex beaked. Seeds 5–5.5 mm in diam. Fl. May, fr. Nov.

- Upland thickets and moist secondary forests; 400–600 m. S Yunnan.

15. Zanthoxylum yunnanense var. dissitum

**原变种** yuan bian zhong xian ke hua jiao

Woody climbers. Stem grayish white. Branchlets, leaf rachises, and midvein of leaflet blades with brownish red prickles. Leaves (3 or)5–9-foliolate; petiolules 3–10 mm; leaflet blades alternate to subopposite, symmetric or rarely oblique, to 20 × 1–8 cm, thickly papery to subleathery, glabrous, oil glands inconspicuous, midvein adaxially impressed, margin entire, repand, denticate, or serrate, apex acuminate to caudate. Inflorescences axillary, to 10 cm; rachis pubescent. Flowers 4-merous. Perianth in 2 series. Sepals purplish green, broadly ovate, less than 1 mm. Petals pale yellowish green, broadly ovate, 4–5 mm. Male flowers: pedicel 1–3 mm; stamens 4; filaments 5–6 mm; rudimentary gynoecium 4-lobed. Female flowers without staminodes. Fruit follicles brown, densely pressed together in infructescence, 1–1.5 cm; outer part of pericarp (exocarp and mesocarp) extended beyond endocarp on each side of suture in dehisced fruit, smooth. Seeds 8–10 mm in diam. Fl. Apr–May or Nov–Dec, fr. Sep–Nov.

- Upland thickets and open forests, forests; 300–2600 m. S Gansu, Guangdong, Guangxi, Hainan, SW Henan, Hubei, Hunan, S Shaanxi, Sichuan, Yunnan.

1a. Branchlets with congested straight spines ..................................................... 16c. var. hispidum

1b. Branchlets without congested straight spines.

2a. Margin of leaflet blades acutely serrate ........................................ 16d. var. acutiserratum

2b. Margin of leaflet blades entire, repand, or denticate.

3a. Leaflet blades ca. 6 × as long as wide, margin entire ............ 16a. var. dissitum

3b. Leaflet blades 7–10 × as long as wide; margin repand or denticate ................. 16b. var. lanciforme

16a. Zanthoxylum dissitum var. dissitum

**原变种** yuan bian zhong xian ke hua jiao

Woody climbers. Branchlets with prickles. Leaf rachises, inflorescences, and adaxial surface of petiolules minutely puberulent but other parts glabrous. Leaves 7–15-foliolate; petiolules 2–4 mm; leaflet blades alternate to subopposite, elliptic, ovate, or rarely obovate, 6–10 × 2.5–4 cm, subleathery, oil glands inconspicuous on mature leaflets, midvein adaxially impressed, secondary and tertiary veins ridged on both surfaces, base rounded to broadly cuneate, margin entire, apex shortly caudate. Inflorescences terminal or axillary, thyrsiform, to 26 cm. Flowers 4-merous. Perianth in 2 series. Sepals purplish green, broadly ovate, ca. 1 mm. Petals oblong, 3–4 mm. Stamens 4; connective with an oil gland at apex. Infuctescences ca. 12 cm wide. Fruit follicles dark brownish black, ca. 6 mm in diam., oil glands inconspicuous, apex beaked. Seeds 5–5.5 mm in diam. Fl. May, fr. Nov.

- Upland thickets; 300–2600 m. S Gansu, Guangdong, Guangxi,

长叶蚬壳花椒 chang ye xian ke hua jiao


17. Zanthoxylum collinsiae


针边蚬壳花椒 zhen bian xian ke hua jiao

Leaflet blades oblong, 6–10 × 2–3 cm, margin acutely serrate. Fl. Apr–May, fr. Sep–Nov.


荔波花椒 li bo hua jiao

Shrubs or woody climbers, to 1.5 m tall or long. Branchlets and leaf rachises with prickles. Older branchlets brownish black, rugulose, pubescent. Leaf rachises, inflorescences, and petiolules pubescent. Leaves 5–9-foliolate; petiolules 2–5 mm; leaflet blades subopposite to alternate, ovate to elliptic, 6–8 × 2.5–3.5 cm, subleathery, abaxially pubescent, midvein adaxially plane or apically impressed and puberulent, secondary veins 10–13 on each side of midvein, base rounded, margin entire, apex mucronate to acuminate. Inflorescences axillary, 3–4 cm. Fruit pedicel 6–10 mm; fruit 4-carpedelled, usually only 2 or 3 carpels developing; follicles dark brownish black when dry, 7–8 mm in diam., pubescent when young but perhaps only on undeveloped carpels, oil glands inconspicuous, apex beaked. Seeds 5–6 mm in diam. Fl. Aug–Sep.

19. Zanthoxylum echinocarpum


刺壳花椒 ci ke hua jiao

Woody climbers. Young branchlets, leaf rachises, petiolules, and leaflet blades abaxially on midvein pubescent. Branchlets and leaves with prickles. Leaves (3 or)5–11-foliolate; petiolules 2–5 mm; leaflet blades opposite or alternate, ovate, ovate-elliptic, or long elliptic, 7–13 × 2.5–5 cm, thickly leathery, base rounded to cordate, margin entire or subentire. Inflorescences axillary or terminal. Flowers 4-merous. Perianth in 2 series. Sepals pale purplish green. Petals 2–3 mm. Male flowers: stamens 4. Female flowers: carpels (3 or)4(or 5). Fruit pedicel obsolete or to 3 mm; follicles with prickles to 1 cm. Seeds 6–8 mm in diam. Fl. Apr–May, fr. Oct–Dec.

19a. Zanthoxylum echinocarpum var. tomentosum

刺壳花椒(原变种) ci ke hua jiao (yuan bian zhong)

Fagara echinocarpa (Hemsley) Engler.

Leaflet blades abaxially glabrous except for pubescent midvein. Prickles of follicles pubescent.

1a. Abaxial surface of leaflet blades glabrous except for pubescent midvein ........................................ 19a. var. echinocarpum

1b. Abaxial surface of leaflet blades villous ........................................ 19b. var. tomentosum

19b. Zanthoxylum echinocarpum var. tomentosum

毛刺壳花椒 mao ci ke hua jiao

Branchlets, leaf rachises, petiolules, abaxial surface of leaflet blades, and inflorescence rachises villous. Prickles of
follicles pilose when mature.

- Hillside open forests and thickets; 300–1800 m. NW Guangxi (Tian’e), SW Guizhou (Anlong), SE Yunnan.


**尖叶花椒** jian ye hua jiao

*Zanthoxylum* oxyphyllum (Edgeworth) Engler; *Zanthoxylum alpinum* C. C. Huang; *Z. taliense* C. C. Huang; *Z. tibetanum* C. C. Huang.

Shrubs or small trees. Branchlets and leaf rachises with prickles. Leaf rachises adaxially and midvein of leaflet blades adaxially pubescent. Old leaves subglabrous. Leaves 11–19-foliolate; petiolules to 2 mm; leaflet blades alternate or opposite, lanceolate or rarely ovate, 5–12 × 1.5–2.5 cm, abaxially gray when dry, oil glands numerous, midvein impressed adaxially, secondary veins anastomosing near margin, reticulate veinlets ridged when dry, base cuneate, margin serrulate, apex acuminate. Inflorescences terminal, cymose-corymbosely, to 30-flowered. Perianth in 2 series. Sepals green, broadly ovate. Many flowered; rachis purplish red, 6–7 mm, oil glands impressed when dry, apex beaked. Seeds ca. 5 mm in diam. Fl. May–Jun, fr. Sep–Oct. 2n = 72.

Open forests, forest margins; 1800–2900 m. S Xizang, W Yunnan [Bhutan, NE India, Myanmar, Nepal].


**狭叶花椒** xia ye hua jiao

*Zanthoxylum* stenophyllum (Hemsley) Engler; *Z. taliense* var. *shanense* C. C. Huang; *Z. tibetanum* var. *shanense* C. C. Huang.

Shrubs or small trees. Branchlets and leaf rachises with prickles. Leaf rachises adaxially and midvein of leaflet blades adaxially pubescent. Old leaves subglabrous. Leaves 11–19-foliolate; petiolules to 2 mm; leaflet blades alternate or opposite, lanceolate or rarely ovate, 5–12 × 1.5–2.5 cm, abaxially gray when dry, oil glands numerous, midvein impressed adaxially, secondary veins anastomosing near margin, reticulate veinlets ridged when dry, base cuneate, margin serrulate, apex acuminate. Inflorescences terminal, cymose-corymbosely, to 30-flowered. Perianth in 2 series. Sepals green, broadly ovate. Many flowered; rachis purplish red, 6–7 mm, oil glands impressed when dry, apex beaked. Seeds ca. 5 mm in diam. Fl. May–Jun, fr. Sep–Nov.

- Upland open forests and thickets; 700–3200 m. Guizhou, Sichuan, Yunnan.


**贵州花椒** gui zhou hua jiao


Shrubs or small trees. Branchlets and leaf rachises with prickles. Branchlets pale purplish red and glaucous when dry. Leaves 5–13-foliolate; petiolules 3–6 mm; leaflet blades alternate, ovate, lanceolate, or rarely broadly ovate, 3–10 × 1.5–4.5 cm, oil glands inconspicuous, midvein adaxially impressed, base subordinated to broadly cuneate, margin crenulate or entire toward base, apex obliquely caudate with a retuse tip. Inflorescences terminal, cymose-corymbiform, to 30-flowered. Flowers 4-merous. Perianth in 2 series. Sepals ca. 3 mm. Female flowers (3 or)4-carpelled. Fruit pedicel to 4.5 mm, 0.5–1 mm in diam.; follicles purplish red, ca. 5 mm in diam., oil glands impressed, apex beaked. Seeds ca. 4 mm in diam. Fl. May–Jun, fr. Sep–Nov.

- Upland thickets; 700–2400 m. S Fujian, Guangdong, Guangxi, Hainan, S Yunnan [India, Indonesia, Malaysia, Philippines, Thailand, Vietnam].

**23. Zanthoxylum avicennae** (Lamarck) Candolle, Prodr. 1: 726. 1824.

**小花花椒** xiao hua hua jiao


Trees to 15 m tall, deciduous. Branchlets and leaves glabrous, with prickles. Leaves 11–21-foliolate; rachis winged; leaflet blades opposite or rarely subopposite, obliquely ovate, rhomboidal, obovate, or falcate, 2.5–7 × 1–3 cm, oil glands visible on fresh leaves or inconspicuous, margin entire or apically crenate, apex mucronate to blunt. Inflorescences terminal, many flowered; rachis purplish red. Flowers 5-merous. Pedicel purplish red. Perianth in 2 series. Sepals green, broadly ovate. Petals yellowish white, ca. 2.5 mm. Male flowers: stamens 5; rudimentary gynoecium disciform, 2-lobed. Female flowers: carpels 2 (or 3); staminodes small. Fruit pedicel 3–6 mm; follicles pale purplish red, 4–5 mm in diam., oil glands numerous, large, and slightly protruding, apex not beaked. Seeds 3.5–4.5 mm in diam. Fl. Jun–Aug, fr. Oct–Dec.

Secondary forests in lowland flat areas, hillsides, valleys; 400–700 m. S Fujian, Guangdong, Guangxi, Hainan, S Yunnan [India, Indonesia, Malaysia, Philippines, Thailand, Vietnam].


**小花花椒** xiao hua hua jiao

*Fagara biondii* Pampanini; *F. micrantha* (Hemsley) Engler.

Trees to 15 m tall, deciduous. Branchlets glabrous, with prickles. Leaves 9–17-foliolate; petiolules 1.5–5 mm; leaflet blades opposite or on basal part of rachis subopposite, lanceolate, 5–8 × 1–3 cm, oil glands numerous, midvein impressed,
secondary veins 8–12 on each side of midvein, base symmetrically or obliquely rounded to broadly cuneate, margin crenate, apex acuminate. Inflorescences terminal, many flowered. Flowers 5-merous. Perianth in 2 series. Sepals broadly ovate, ca. 0.3 mm wide. Petals pale yellowish white, 1.5–2 mm. Male flowers: stamens 5, ca. 3 mm; rudimentary gynoecium disciform, 3-lobed or not divided. Female flowers 3(4)-carpellate. Fruit follicles pale purplish red but pale yellow to grayish brown when dry, ca. 5 mm in diam., oil glands small, not beaked. Seeds to 4 mm. Fl. Jul–Aug, fr. Oct–Nov.

- Hillside open forests; 300–1200 m. Guizhou, SW Henan, W Hubei, Hunan, Sichuan, Yunnan.


椿叶花椒 chun ye hua jiao

Trees to 15 m tall, deciduous. Branchlets and inflorescence rachises glabrous, with prickles. Leaves 11–27-foliolate; leaflet blades opposite, narrowly lanceolate but subovate basally on rachis, 7–18 × 2–6 cm, abaxially grayish green or glaucous, oil glands numerous, midvein adaxially impressed, secondary veins 11–16 on each side of midvein, base symmetrically or subobliquely rounded, margin crenate, apex acuminate. Inflorescences terminal, many flowered. Flowers 5-merous, subsessile. Perianth in 2 series. Sepals broadly triangular, ca. 0.8 mm. Petals pale yellowish white, ca. 2.5 mm. Male flowers: stamens 5; rudimentary gynoecium disciform, 2- or 3-lobed. Female flowers (3 or)4-carpellate. Fruit pedicle 1–3 mm; follicles pale reddish brown but pale gray to brownish gray when dry, ca. 4.5 mm in diam., oil glands numerous, impressed when dry, apex not beaked. Seeds ca. 4 mm in diam. Fl. Aug–Sep, fr. Oct–Dec.

Upland thickets; 300–1500 m. Fujian, Guangdong, Guangxi, Guizhou, S Jiangxi, SE Sichuan, Taiwan, SE Yunnan, Zhejiang [Japan (including Bonin and Ryukyu Islands), Korea, Philippines].

1a. Leaflet blades glabrous on both surfaces

25a. var. ailanthoides

1b. Leaflet blades abaxially pubescent

25b. var. pubescens

25a. Zanthoxylum ailanthoides var. ailanthoides

椿叶花椒 (原变种) chun ye hua jiao (yuan bian zhong)


Leaflet blades glabrous on both surfaces, abaxially glaucous.

Upland thickets; 300–1500 m. Fujian, Guangdong, Guangxi, Guizhou, S Jiangxi, SE Sichuan, Taiwan, SE Yunnan, Zhejiang [Japan (including Bonin and Ryukyu Islands), Korea, Philippines].

Zanthoxylum hemsleyanum Makino was based on Z. emarginellum sensu Hemsley (1895), not Miquel (1867).


毛椿叶花椒 mao chun ye hua jiao

Leaf rachises and abaxial surface of leaflet blades pubescent.

- Taiwan.

This taxon is not recognized as a separate variety in Fl. Taiwan, ed. 2, 3: 537. 1993.


大叶臭花椒 da ye chou hua jiao

Trees to 15 m tall, deciduous. Branchlets toward apex and rachis of inflorescences with prickles. Leaves without prickles, 7–17-foliolate; leaflet blades opposite, broadly ovate, ovate-elliptic, or oblong, but suborbicular basally on rachis, 10–20 × 4–10 cm, both surfaces glabrous, oil glands numerous, large, turning red or blackish brown and slightly protruding when dry, midvein adaxially impressed, base symmetrically or obliquely rounded to broadly cuneate, margin crenulate-serrulate. Inflorescences terminal, to 35 × 30 cm, many flowered. Flowers 5-merous. Perianth in 2 series. Sepals broadly ovate, ca. 0.3 mm. Petals white, ca. 2.5 mm. Male flowers: stamens 5; rudimentary gynoecium disciform, 3-lobed. Female flowers: carpels (2 or)3(4); staminodes small. Fruit follicles reddish brown, ca. 4.5 mm in diam., oil glands numerous, apex not beaked. Seeds ca. 4 mm in diam. Fl. Jun–Aug, fr. Sep–Nov.

Hillside forests; forests; 200–1500 m. Fujian, Guangdong, Guangxi, SE Guizhou, Hainan, S Hunan, Jiangxi, S Yunnan, S Zhejiang [Bhutan, India, Indonesia, Malaysia, Myanmar, Philippines, Vietnam].

1a. Petiolules, leaflet blades, leaf rachises, and inflorescences not villous ....... 26a. var. myriacanthum

1b. Petiolules, leaflet blades, leaf rachises, and inflorescences villous ............... 26b. var. pubescens

26a. Zanthoxylum myriacanthum var. myriacanthum

大叶臭花椒 (变种) da ye chou hua jiao (bien zhong)


Leaf rachises, petiolules, leaflet blades, and inflorescence rachises not villous.

Hillside forests; 200–1500 m. Fujian, Guangdong, Guangxi, SE Guizhou, Hainan, S Hunan, Jiangxi, S Yunnan, S Zhejiang [Bhutan, India, Indonesia, Malaysia, Myanmar, Philippines, Vietnam].


毛大叶臭花椒 mao da ye chou hua jiao


**朵花椒**


Trees to 10 m tall, deciduous. Bark brownish black. Young branches and rachis of inflorescences with prickles. Young branches dark purplish red. Leaves (5–)13–19-foliolate; rachis pubescent; leaflet blades opposite, subsessile, broadly ovate, elliptic, or rarely suborbicular, 8–15 × 4–9 cm, thickly leathery, abaxially with soft grayish white to grayish yellow woolly-villosous indumentum, oil glands inconspicuous, midvein adaxially impressed, secondary veins 11–17 on each side of midvein, base symmetrically or rarely obliquely rounded to subcordate, margin entire or crenulate, apex acute. Inflorescences terminal, many flowered. Flowers 5-merous. Pedicel pale purplish red, pubescent. Perianth in 2 series. Petals white, 2–3 mm. Male flowers: rudimentary gynoecium 3-lobed. Female flowers: staminodes 4 or 5; rudimentary gynoecium 3-carpelled. Seeds 5–7 mm in diam. Fl. Jul–Sep, fr. Sep–Nov. 2n = 36, 68.

Moist areas in upland forests, hillside open forests and thickets; 300–2400 m. S Gansu, N Guangdong, Guangxi, Guizhou, Hainan, SW Henan, W Hubei, Hunan, S Shaanxi, Sichuan, Taiwan, Yunnan [Thailand, Vietnam].

C. C. Huang (Fl. Reipubl. Popularis Sin. 43(2): 40. 1997) mistakenly placed *Zanthoxylum dimorphophyllum* in synonymy of *Z. ovalifolium* Wight, which ranges from India to NE Australia and is not known to occur in China.


**异叶花椒**

Trees to 10 m tall, deciduous. Branches grayish black, with few prickles or unarmed; young branchlets and shoots rust-colored pubescent or glabrous; axillary buds rust-colored villosulous. Leaves 3–5–(11)-foliolate; leaflet blades ovate, elliptic, or sometimes obovate, (2–)4–9–(20) × (1–)2–3.5–(7) cm, oil glands numerous, midvein adaxially plane or impressed and puberulent, reticulate veinlets slightly ridged when dry, base symmetric, margin crenate and with or without spines, apex blunt, rounded, mucronate, or acuminate, usually with a retuse tip. Inflorescences terminal; bracts rust-colored villosulous. Perianth in 2 series with 4 sepals and 4 petals or grading to 2 irregular series or 1 series with 7 or 8 undifferentiated 2–3 mm tepals; when differentiated, sepals 0.2–0.5 mm and petals ca. 1.5 mm. Male flowers: stamens 4–6; disk pulvinate; rudimentary gynoecium obsolete or 2- or 3-carpelled. Female flowers: staminodes 4 or 5; rudimentary anthers without pollen; gynoecium 2- or 3-carpedel; styles recurved. Fruit follicles purplish red, 6–8 mm in diam., sparsely pubescent when young, with sparse oil glands, stipitate, apex shortly beaked. Seeds 5–7 mm in diam. Fl. Apr–Jun, fr. Sep–Nov. 2n = 36, 68.

Moist areas in upland forests, hillside open forests and thickets; 300–2400 m. S Gansu, N Guangdong, Guangxi, Guizhou, Hainan, SW Henan, W Hubei, Hunan, S Shaanxi, Sichuan, Taiwan, Yunnan [Thailand, Vietnam].

Fagara *dimorphophylla* (Hemsley) Engler; *F. robiginosa* Reeder & S. Y. Cheo; *Zanthoxylum acanthopodum* Candolle var. *deminutum* (Rehder) Reeder & S. Y. Cheo; *Z. dimorphophyllum* var. *deminutum* Rehder; *Z. evooidifolium* Guillaumin; *Z. pistaciiforum* Hayata; *Z. robiginosum* (Reeder & S. Y. Cheo) C. C. Huang.

Leaves 3- or 5-foliolate; margin of leaflet blades without spines.

Moist areas in upland forests; 300–2400 m. S Gansu, N Guangdong, Guangxi, Guizhou, Hainan, W Hubei, Hunan, S Shaanxi, Sichuan, Taiwan, Yunnan [Thailand, Vietnam].

多异叶花椒 duo yi ye hua jiao

*Zanthoxylum ovalifolium* Wight var. *multifoliolatum* (C. C. Huang) C. C. Huang.

Leaves (5 or)7–11-foliolate; margin of leaflet blades without spines.

- Hillside thickets. Yunnan (Kunning).


刺异叶花椒 ci yi ye hua jiao


Leaves 3- or 5-foliolate; margin of leaflet blades with spines.

- Hillside open forests and thickets; 400–2100 m. Guizhou, SW Henan (Funiu Shan), W Hubei, Hunan, S Shaanxi (Qin Ling), Sichuan.


刺花椒 ci hua jiao

*Zanthoxylum acanthopodium* var. *oligotrichum* Z. M. Tan; Z. *acanthopodium* var. *timbor* J. D. Hooker; Z. *acanthopodium* var. *villosum* C. C. Huang.

Shrubs, woody climbers, or trees to 6 m tall. Bark grayish black. Branchlets rust-colored pubescent to nearly glabrous, usually with prickles. Leaves 3–9(or 11)-foliolate; racis glabrous or rust-colored pubescent, wings to 6 mm on each side; leaflet blades subsessile, opposite, lanceolate, ovate, or elliptic, 3–12 × 1–3 cm, base attenuate to broadly cuneate, secondary veins 7–15 on each side of midvein and generally faint, margin crenate or entire and often revolute when dry, apex acute to acuminate. Inflorescences terminal on short lateral branchlets and sometimes axillary, 1–7 cm, with less than 30 flowers. Perianth in 2 irregular series or 1 series, with 6–8 ± undifferentiated 0.3–1.5 mm tepals. Male flowers: stamens 4–6; anthers yellow prior to anthesis; connective apex with oil gland; disk pulvinate; rudimentary carpels lacking. Female flowers: carpels 2 or 3, abaxially often with a conspicuous oil gland; styles recurved; staminodes ligulate or lacking. Fruit follicles usually purplish red, 4–5 mm in diam., with a few protruding oil glands. Seeds blackish brown, 3–4 mm in diam. Fl. Apr–May, fr. Aug–Oct. 2n = 66.

Found in many habitats; below 3100 m. Anhui, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, S Shanxi, Sichuan, N Taiwan, Xizang, Yunnan, Zhejiang [Bangladesh, Bhutan, India, Indonesia, Japan (including Ryukyu Islands), Kashmir, Korea, Laos, Myanmar, Nepal, Pakistan, Philippines, Thailand, Vietnam].

Ohba (Fl. Jap. 22c: 37. 2001) treats the plants from Japan and most of China as *Zanthoxylum armatum* var. *subtrifoliolatum* (Franchet) Kitamura.

1a. Young branchlets and inflorescence rachises glabrous or young branches sparsely pubescent

1b. Young branchlets and inflorescence rachises rust-colored pubescent

31a. *Zanthoxylum armatum* var. *armatum*

竹叶花椒(原变种) zhu ye hua jiao (yuan bian zhong)


Young branchlet apices and inflorescence rachises glabrous, or young branches sparsely pubescent. Leaflet blades abaxially flocculent on midvein.

Found in many habitats; below 3100 m. Anhui, Fujian, S Gansu, N Guangdong, Guangxi, Guizhou, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi, Shandong, S Shanxi, Sichuan, N Taiwan, Xizang, Yunnan, Zhejiang [Bangladesh, Bhutan, India, Indonesia, Japan (including Ryukyu Islands), Kashmir, Korea, Laos, Myanmar, Nepal, Pakistan, Philippines, Thailand, Vietnam].


毛竹叶花椒 mao zhu ye hua jiao


Young branchlet apices, inflorescence rachises, and some-
times leaf rachises rust-colored pubescent.

- Guangdong, Guangxi, Guizhou, Hunan, Shaanxi, Sichuan, Yunnan.


屏东花椒 ping dong hua jiao

Shrubs. Branchlets with prickles or unarmed, glabrous. Leaves 5–13-foliolate; rachis canaliculate, sides of channel rarely slightly spreading apically; leaflet blades sessile, opposite, oblong to oblong-lanceolate, 2.5–10 × 0.6–2 cm, leathery, midvein narrowly ridged adaxially, secondary veins 7–16 on each side of midvein, base attenuate to cuneate, margin crenulate, apex acuminate at least in terminal blade. Inflorescences axillary, panicle. Flowers yellow. Pedicel ca. 3 mm. Perianth in 2 irregular series or 1 series, with 5–8 ± undifferentiated tepals. Male flowers: stamens 5–8. Female flowers: pistil subtended by columnar disk, 1(or 2)-carpelled; carpel ovoid to ellipsoid, with a conspicuous lateral oil gland; style short; stigma capitate. Fruit follicle ovoid, ca. 5 mm in diam. Fl. Apr.

- Exposed slopes in secondary broad-leaved forests; 1300–1400 m. Taiwan (Pingdong).


花椒 hua jiao

Trees 3–7 m tall, deciduous. Stems and branchlets with prickles; stem prickles with a flat base. Young branchlets pubescent. Leaves 5–13-foliolate; rachis marginate; leaflet blades sessile, opposite, ovate, elliptic, or rarely lanceolate, sometimes suborbicular near leaf rachis base, 2.7 × 1–4.5 cm, both surfaces pubescent or abaxial surface flocculent along midvein, midvein adaxially impressed, margin crenate. Inflorescences axillary but terminal on lateral branchlets; rachis and pedicel pubescent or glabrous. Perianth in 2 irregular series or 1 series, with 6–8 yellowish green ± undifferentiated tepals. Male flowers: stamens 5–8. Female flowers: pistil subtended by columnar disk, 1(or 2)-carpelled; carpel ovoid to ellipsoid, with a conspicuous lateral oil gland; style short; stigma capitate. Fruit follicle ovoid, ca. 5 mm in diam. Fl. Apr.

- Found in many habitats; below 3200 m. Anhui, Fujian, Gansu, Guangxi, Guizhou, Hebei, Henan, Hunan, Jiangsu, Jiangxi, Liaoning, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, SE Xinjiang, S and SE Xizang, Yunnan, Zhejiang [Bhutan].

The dried fruit follicles of *Zanthoxylum bungeanum* are used as a culinary spice and are particularly popular in Sichuan cuisine (Sichuan pepper). In Japan, *Z. Piperitum* (Linnaeus) Candolle is sometimes similarly used.

1a. Leaflet blades pubescent on both surfaces or sometimes adaxial surface glabrous ........................................ 33a. var. punctatum

1b. Leaflet blades flocculent along midvein abaxially, otherwise glabrous.

2a. Leaflet blades with oil glands only

2b. Leaflet blades with scattered oil glands ........................................ 33a. var. bungeanum

33a. *Zanthoxylum bungeanum* var. bungeanum

花椒(原变种) hua jiao (yuan bian zhong)

*Zanthoxylum bungei* Hance; *Z. Bungei var. imperforatum* Franchet; *Z. fraxinoides* Hemsley; *Z. simulans* Hance var. *imperforatum* (Franchet) Reeder & S. Y. Cheo.

Leaflet blades flocculent along midvein abaxially, otherwise glabrous, oil glands only at margin.

- Found in many habitats; below 3200 m. Anhui, Fujian, Gansu, Guangxi, Guizhou, Hebei, Henan, Hunan, Jiangsu, Jiangxi, Liaoning, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, SE Xinjiang, S and SE Xizang, Yunnan, Zhejiang [Bhutan].


油叶花椒 you ye hua jiao


- Open forests; 2000–2500 m. W Sichuan.


毛叶花椒 mao ye hua jiao


- 1700–3200 m. Gansu, Qinghai (Xunhua), S Shaanxi, NW and W Sichuan, Yunnan.


浪叶花椒 lang ye hua jiao

Trees to 3 m tall. Young branchlets and leaf rachises rust-colored pubescent, with few prickles or unarmed. Leaves 3–5(–7)-foliolate; terminal leaflet with petiolo 6–10 mm, lateral leaflets subsessile; leaflet blades opposite, ovate to ovate-lanceolate, 3–8 × 1.5–3.5 cm, abaxially glabrous, adaxially sparsely puberulent, midvein adaxially plane, secondary veins 6–10 on each side of midvein, base broadly cuneate to rounded, margin undulate and crenulate, apex mucronate to acuminate. Inflorescences terminal, corymbose. Perianth in 2 irregular series or 1 series, with 5–8 ± undifferentiated tepals. Fruit pedicel reddish brown, 0.7–1.4 cm; follicles reddish brown, ca. 5 mm in diam., oil glands large and impressed, apex not beaked. Seeds ca. 4 mm in diam. Fl. Apr.–May, fr. Aug.–Oct.

- Forests, thickets; 1600–3200 m. W Hubei, S Shaanxi, E Sichuan, NE Yunnan.


岭南花椒 ling nan hua jiao
Shrubs or trees, rarely to 3 m tall, dioecious or rarely polygamo-monocious, all parts glabrous. Branchlets blackish brown, unarmed. Leaves 5–11-foliolate; rachis terete; lateral leaflets opposite, sessile or subsessile; terminal leaflet with petiolule 1–3 mm; leaflet blades ovate to lanceolate, 6–11 × 3–5 cm, oil glands clear but dark reddish brown to blackish brown when dry, midvein adaxially impressed or plane, secondary veins 11–15 on each side of midvein, base rounded to subcordate or oblique, margin serrulate, apex acuminate. Inflorescences terminal, usually on lateral branchlets, to 30-flowered. Pedicel 5–8 mm. Perianth in 2 irregular series or 1 series, with 7–9 ± undifferentiated tepals. Tepals basally pale yellowish green and apically dark purplish red, lanceolate to oblanceolate, ca. 1.5 mm. Bisexual flowers: stamens 3 or 4; carpels 4. Male flowers: stamens 6–8. Female flowers: carpels 3 or 4; styles recurved; stigmas capitulate. Fruit pedicel dark purplish red, 1–2 cm; follicles dark purplish red, ca. 5 mm in diam., with sparse protruding oil glands, apex subrounded or shortly beaked. Seeds ca. 4 × 3–4 mm. Fl. Mar–Apr, fr. Aug–Oct.

- Hillside open forests and thickets, upland thickets; 300–1700 m. S Anhui, Fujian, N Guangdong, NE Guangxi, SW Hubei, Hunan, Jiangxi, Zhejiang.

1a. Leaflet blades dark reddish brown to blackish brown when dry, glabrous

35a. Zanthoxylum austrosinense var. austrosinense

岭南花椒 (原变种) ling nan hua jiao (yuan bian zhong)

Zanthoxylum austrosinense var. stenophyllum C. C. Huang.

Leaflet blades dark reddish brown to blackish brown when dry, glabrous.

- Hillside open forests and thickets; 300–900 m. S Anhui, Fujian, N Guangdong, NE Guangxi, SW Hubei, Hunan, Jiangxi, Zhejiang.


毛叶岭南花椒 maoye ling nan hua jiao

Leaflet blades dark grayish green when dry, adaxially hirsutulous

- Upland thickets; ca. 1700 m. S Gansu, W Henan, S Shaanxi, Sichuan.


微柔毛花椒 wei rou mao hua jiao

Shrubs 1–2 m tall. Branchlets with prickles, puberulent when young. Leaves (5 or)7–11-foliolate; leaflet blades sessile, ovate to ovate-elliptic, 0.5–3 × 0.4–1.5 cm but terminal one to 5 × 2.5 cm, thinly papery, grayish green when dry, oil glands inconspicuous, base symmetric and remotely crenulate, apex mucronate to acuminate. Inflorescences terminal; rachis with short trichomes. Perianth in 2 irregular series or 1 series, with 5–8 ± undifferentiated tepals. Male flowers: tepals lanceolate, 1.2–1.5 mm; stamens 5 or 6. Female flowers: carpels 2 or 3 (or 4); styles recurved. Fruit follicles purplish red, 4–5 mm in diam., with a few protruding oil glands. Seeds 3–4 mm in diam. Fl. May, fr. Jun–Jul.

- 1700–2500 m. S Gansu, W Henan, S Shaanxi, Sichuan.


翼刺花椒 yi ci hua jiao

Shrubs 2–3 m tall. Branchlets grayish green, glabrous, densely covered with setiform prickles and strongly compressed pseudostipular decurrent prickles forming a wing which joins them between nodes. Leaves 7–13-foliolate; rachis marginate, glabrous; leaflet blades subsessile, opposite or subopposite, lanceolate to oblong-lanceolate, 2–4 × 0.8–1.5 cm, oil glands inconspicuous, base slightly oblique and subrounded to broadly cuneate, margin apically crenulate, apex acuminate with a mucronate, obtuse, or emarginate tip. Inflorescences terminal; rachis base with prickles. Fruit pedicel 5–8 mm;
developed follicles 1–3 with carpels in female flowers at least 3, ca. 5 mm, pubescent. Seeds 3–4 mm.

● Upland thickets; ca. 1000 m. W Hubei (Xingshan).


野花椒 ye hua jiao

_Fagara podocarpa_ (Hemsley) Engler; _F. setosa_ (Hemsley) Engler; _Zanthoxylum acanthophyllum_ Hayata; _Z argyi_ H. Léveillé; _Z bungei_ Hance var. _inermis_ Franchet; _Z podocarpum_ Hemsley; _Z setosum_ Hemsley; _Z similans_ var. _podocarpum_ (Hemsley) C. C. Huang.

Shrubs or small trees. Stems and branchlets with prickles. Young branchlets and leaflet blades abaxially on midvein pubescent, sometimes also secondary veins pubescent, sometimes all parts glabrous. Leaves 5–15-foliolate; rachis winged; leaflet blades sessile or at base of leaf rachis with a short petiolule, opposite, ovate, ovate-elliptic, or lanceolate, 2.5–7 × 1.5–4 cm, adaxially with spines, oil glands numerous, translucent, and slightly protruding when dry, midvein impressed, base slightly oblique, margin crenate, apex acute to mucronate or with a retuse tip. Inflorescences terminal. Perianth in 2 irregular series or 1 series, with 6–8 ± undifferentiated tepals. Tepals usually lanceolate, 2–3 mm. Male flowers: stamens 5–8; connective with oil gland at tip. Female flowers: carpels 3 or 4; styles recurved. Rachis of infructescences purplish red. Fruit pedicel purplish red, 5–8(–10) mm; follicles purplish red, ca. 5 × 4 mm, base attenuate into a 1–3 mm stipe, oil glands slightly protruding when dry. Seeds ca. 4 × 3.5 mm. Fl. Apr–May, fr. Jul–Aug.

● Forests; 100–800 m. NW Fujian, N Guangdong, NE Guangxi, S Hunan.


梗花椒 geng hua jiao

Shrubs or trees, 1–3 m tall, glabrous except for leaflet blades. Prickles to 1.5 cm. Branchlets blackish brown when dry. Leaves 7–17-foliolate; leaflet blades subsessile or with petiolule to 2 mm, opposite, lanceolate to ovate but suborbicular at base of leaf rachis, 1–5 × 0.7–1.3 cm, papery, abaxially purplish red when young, turning grayish green when mature, and reddish brown to dark blackish red when dry, oil glands sparse and protruding on both surfaces when dry, midvein abaxially rust-colored flocculent and adaxially impressed, margin serrulate. Inflorescences terminal. Perianth in 2 irregular series or 1 series, with 6–8 ± undifferentiated tepals. Tepals usually lanceolate, 2–3 mm. Male flowers: stamens 5–8; connective with oil gland at tip. Female flowers: carpels 3 or 4; styles recurved. Rachis of infructescences purplish red. Fruit pedicel purplish red, 5–8(–10) mm; follicles purplish red, ca. 5 × 4 mm, base attenuate into a 1–3 mm stipe, oil glands slightly protruding when dry. Seeds ca. 4 × 3.5 mm. Fl. Mar–May, fr. Jul–Sep. 2n = ca. 132*.

● Plains or upland forests. Anhui, Fujian, Gansu, N Guangdong, NE Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Qinghai, Shaanxi, Shandong, Taiwan, Zhejiang.