
木蓼属 *mu liao shu*

Bao Bojian; Alisa E. Grabovskaya-Borodina

Shrubs much branched; woody branches with spines or not, herbaceous branchlets of current year with leaves and flowers. Leaves simple, alternate, rarely fascicled, nearly sessile; ocrea membranous, usually with 2 veins, 2-parted at apex. Inflorescence racemose, terminal, or lateral, with dense or sparse axillary flowers. Pedicel slender, jointed. Flowers hermaphroditic. Perianth persistent, 4- or 5-parted, inflated in fruit. Stamens 6 or 8; filaments dilated at base and united into a glandular ring. Ovary lenticularly compressed or trigonous; styles 2 or 3, short; stigmas capitulate. Achenes lenticular or trigonous.


1a. Tepals 4; stamens 6; styles 2; achenes lenticularly compressed.

1b. Tepals 5; stamens 8; styles 3; achenes trigonous.

2a. Branchlets of current year and leaves with densely papillate hairs .......................................................... 3. *A. canescens*

2b. Branchlets of current year and leaves without papillate hairs.

3a. Leaves fascicled; herbaceous branchlets of current year very short .......................................................... 2. *A. compacta*

3b. Leaves alternate; herbaceous branchlets of current year longer, slender ............................................. 1. *A. spinosa*

5a. Leaves grayish green or bluish green.

5b. Leaves green or yellow-green.

6a. Woody branches pointed at apex; inflorescence a short raceme ca. 15 mm ........................................... 5. *A. pungens*

6b. Woody branches obtuse at apex; inflorescence a panicle or raceme.

7a. Shrub 1.5–2 m tall; annual branches lengthened, virgate, dying only in higher part, as a rule branched; inflorescence a panicle with leaves .......................... 8. *A. virgata*

7b. Subshrub 30–50 cm tall; annual branches dying for most part, usually not branched; inflorescence a raceme, flowers from ocrea bracteate ........................................... 9. *A. frutescens*

8a. Woody branches acuminate into point at apex.

8b. Woody branches obtuse at apex, not pointed.

9a. Leaves elliptic or obovate, 15–25 × 10–13 mm, with prominent reticulate veins; pedicel ca. 1 cm, jointed at lower 1/3; perianth light yellow-red ............................................................................ 6. *A. pyrifolia*

9b. Leaves linear or lanceolate, 15–30 × 1–3 mm; midvein prominent; pedicel 5–10 mm, jointed at upper 1/3; perianth light green ........................................................................ 7. *A. irtyschensis*

10a. Leaves oblong or elliptic, prominently veined; outer tepals reniform, spreading in fruit .................................................. 12. *A. bracteata*

10b. Leaves oblanceolate-oblong or lanceolate to linear, not prominently pinnately veined; outer tepals oblong or oblone-ovate, reflexed in fruit.

11a. Outer tepals oblong-ovate, ca. as long as or slightly shorter than above joint portion of pedicel .................................................................................. 10. *A. decipiens*

11b. Outer tepals oblong-ovate, longer than above joint portion of pedicel ........................................... 11. *A. manshurica*


刺木蓼 *ci mu liao*

*Atraphaxis spinosa* var. *angustifolia* Chang Y. Yang & Y. L. Han.

Shrubs 30–100 cm tall. Stem slender, with gray scabrous bark; woody branches slender, without leaves at ends, spine-pointed; herbaceous branchlets of current year soon becoming lignified, straight or slightly flexuous, slender, glabrous. Leaves gray-green or blue-green, orbicular, elliptic, broadly elliptic, or broadly ovate, rarely obovate, 3–7 × 3–5 mm, leathery, both surfaces glabrous, reticulate veins raised abaxially, base rounded or cuneate, gradually narrowing into a short petiole, margin entire or slightly undulate, apex rounded or obtuse, short acuminate; ocrea brown at base, cylindric, 2–3 mm, membranous and inconspicuously veined in upper part, cleft into 2 aristate teeth. Pedicel ca. 5 mm, jointed at middle or slightly below. Flowers 2–6 at leaf axil of current year’s branchlets. Tepals pink; outer tepals reflexed in fruit, oblong-ovate or ovate, 2–3 mm. Achenes compressed, light brown, shiny, ovoid or broadly ovoid, smooth, base rounded, apex acuminate or obtuse. Fl. and fr. May–Sep.

Slopes, deserts including the Gobi, roadsides, margins of cultivated land; 400–1800 m. Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].

2. **Atraphaxis compacta** Ledebour, Fl. Altaic. 2: 55. 1830.

拳木蓼 *quan mu liao*
Shrubs 30–50 cm tall, much branched. Stem flexuous, short, stout; bark gray, splitting longitudinally into fibers; woody branches spreading, straight, without leaves at ends and spine-pointed; herbaceous branchlets of current year very short, soon becoming lignified, with leaves and flowers. Leaves clustered on old branches, gray-green to blue-green, orbicular or broadly ovate, 4–7 × 4–5 mm, both surfaces glabrous, reticulate veins prominent abaxially, base rounded or broadly cuneate, apex rounded or obtuse; ocrea brown at base, cylindrical, 1–3 mm, membranous, cleft into 2 long teeth. Pedicel ca. 5 mm, jointed at middle or slightly above. Flowers 2–6 at leaf axil. Tepals 4, pink; outer tepals reflexed in fruit, ovate-oblong, 2–2.5 × 1.5–2.2 mm, ca. as long as above joint portion of pedicel; inner tepals orbicular-cordate, 4–5 × 5–6 mm, prominently reticulate-veined. Achenes light brown, shiny, broadly ovate, ca. 3.5 mm, smooth. Fl. and fr. June–Aug.

Deserts, roadsides, sandy steppes, stony slopes; 300–1500 m. Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia].


糙叶木蓼 rui zhi mu liao

Shrubs dwarf, 5–10 cm tall. Stem stout; woody branches without leaves at apex, acuminate to spiny, with gray-brown bark; herbaceous branchlets of current year slender, with dense papillate hairs, apex with leaves or flowers. Leaves gray or gray-green, ovate or broadly elliptic, 5–6 × 4–5 mm, both surfaces with papillate hairs, reticulate veins prominent abaxially, base broadly cuneate and gradually narrowing into a short petiole, apex obtuse, with a short point; ocrea cylindric, 4–5 mm, base green with dense papillate hairs, upper part membranous, cleft into 2 slender teeth. Pedicel 5–6 mm, jointed at upper portion. Flowers in racemes at apices of herbaceous branchlets. Tepals dark pink, with white margins; outer tepals ovate, smaller, ca. as long as or slightly shorter than above joint portion of pedicel; inner tepals orbicular-reniform, 4–5 × 5–6 mm, margin entire, slightly undulate, with raised reticulate veins. Achenes light brown, shiny, ovoid, smooth. Fl. and fr. May–Jun.

Sandhills; 500–1500 m. Xinjiang [Kazakhstan].


绿叶木蓼 li ye mu liao

Tragopyrum laetevirens Ledebour, Fl. Altai. 2: 75. 1830.

Shrubs 30–80 cm tall. Stem spreading, stout, branched; woody branches flexuous, slender, without spines, with dark gray bark; epidermis splitting fibrously, apex with leaves or flowers; herbaceous branchlets of current year dark brown, slender, with dense papillose hairs. Leaves bright green, orbicular or broadly elliptic, 1.5–2.3 × ca. 1 cm, leathery, abaxially with papillose hairs along midvein and margin, adaxially glabrous, base rounded, margin entire or undulate-crenate, apex rounded or obtuse, with a short point; ocrea brown at base, cylindrical, with 2 faint veins, cleft into 2 slender teeth at upper portion. Pedicel ca. 1 cm, jointed at lower 1/3. Flowers fewer in terminal racemes. Tepals 5, pink, with white margins; outer tepals 2, reflexed in fruit, broadly ovate, smaller, ca. 1/2 as long as above-joint portion of pedicel; inner tepals 3, rounded cordate, 5–6 × 6–7 mm. Achenes dark brown, shiny, ovoid or trigonous-ovoid, smooth. Fl. May–Jun, fr. Jul–Aug.

Stony mountain slopes, stony steppes; 900–1500 m. Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia].


锐枝木蓼 rui zhi mu liao


Shrubs ca. 1.5 m tall. Stem straight, stout, with gray-brown bark; epidermis splitting fibrously; woody branches flexuous, apex without leaves and acuminate into spines; herbaceous branchlets of current year short, stout, soon becoming lignified, white, glabrous, apex acuminate, with leaves or flowers. Leaves blue-green or gray-green, broadly elliptic or obovate, 10–20 × 5–10 cm, both surfaces glabrous, reticulate veins prominent abaxially, base rounded or broadly cuneate, narrowing into a short petiole, margin entire or slightly undulate with teeth, apex rounded, with a short point or emarginate; ocrea brown at base, cylindrical, membranous, faintly veined, cleft into 2 teeth at upper part. Pedicel long, jointed at or above middle. Flowers in short racemes (ca. 1.5 cm) on lateral herbaceous branchlets of current year. Tepals 5, pink or green-white; outer tepals 2, reflexed in fruit, ovate or broadly elliptic, ca. 3 mm; inner tepals 3, orbicular-cordate in fruit, 5–6 × 6–7 mm, with prominent reticulate veins, margin undulate. Achenes dark brown, shiny, ovoid, ca. 2.5 mm, trigonous, smooth. Fl. and fr. May–Aug.

Stony slopes, gravelly deserts; 500–3400 m. Gansu, Nei Mongol, Qinghai, Xinjiang [India, Kazakhstan, Mongolia, Russia].


梨叶木蓼 li ye mu liao


Shrubs ca. 1 m tall, much branched. Stem stout, tortuous, with gray-brown bark; epidermis splitting longitudinally; woody branches grayish white, straight or tortuous, apex without leaves, acuminate or spiny; herbaceous branchlets of current year glabrous, soon becoming lignified, spiny at apex. Petiole short, 1/6–1/3 length of blade; leaf blade green, broadly elliptic or obovate, 1.5–2.5 × 1–1.3 cm, both surfaces glabrous, reticulate veins prominent abaxially, margin entire or slightly crenate; ocrea brown at base, cylindrical, membranous and pellucid in upper part, deeply cleft into 2 or 3 lanceolate or broadly lanceolate lobes; veins 2 or 3. Pedicel ca. 1 cm, jointed usually at lower 1/3 or below middle. Flowers dense in racemes at lateral branchlets of current year. Tepals 5, light yellow or yellow-red; outer tepals reflexed in fruit, ovate or narrowly elliptic, ca. as long as above-joint portion of pedicel; inner tepals broadly elliptic or orbicular-cordate, 6–7 × 7–8 mm. Achenes light brown, shiny, trigonous-ovoid, smooth. Fl. and fr. May–Jun.

Stony slopes, scrub, Juniperus stands, stony deserts; 700–1500 m. Xinjiang [Afghanistan, ?India, Kazakhstan, Kyrgyzstan, Pakistan, Russia].

Tajikistan.


Shrubs ca. 1 m tall. Stem stout, much branched in upper part, with gray-brown bark; epidermis splitting longitudinally; herbaceous branchlets of current year brown, cylindric, glabrous. Leaves very shortly petiolate, green, lanceolate-oblong or linear, 1.4–4 × 0.2–1.5 cm, leathery, both surfaces glabrous, reticulate veins prominent, base attenuate, margin entire or slightly crenate, apex obtuse, with a short point; ocrea brown at base, cylindric, membranous, with 2 slender veins, oblique in upper part and cleft into 2 teeth. Pedicel stout, jointed above middle. Flowers in terminal racemes on branchlets of current year. Tepals 5, pink; outer tepals reflexed in fruit, oblong-ovate, ca. as long as or shorter than above-joint portion of pedicel; inner tepals 3, broadly elliptic, 4–6 × 4–5 mm. Achenes dark brown, shiny, narrowly ovoid, trigonous, smooth, apex acuminate. Fl. and fr. May–Jul.

Sandy steppes, deserts, roadsides; 600–1000 m. N Xinjiang [Kazakhstan].

11. Atraphaxis manshurica var. angustifolia Losinskaja; A. bracteata var. latifolia H. C. Fu & M. H. Zhao.

Shrubs 1–1.5 m tall. Stem erect, light brown, stout, glabrous; woody branches inclined-spreading, brown, much branched, smooth and glabrous, apex with leaves and flowers. Petiole very short, 1.5–3 mm, glabrous; leaf blade oblong, elliptic, or lanceolate on branchlets of current year, 1.5–3.5 × 0.8–2 cm, leathery, both surfaces glabrous, base rounded or broadly wedge-form, margin slightly undulate, apex obtuse, with a short point; ocrea cylindric, 6–8 mm, membranous, oblique in upper part and cleft into 2 sharp teeth. Racemes terminal on branchlets of current year; bracts lanceolate, ca. 4 mm, membranous, with brown midvein, 2- or 3-flowered. Pedicel ca. 4 mm, jointed at above portion of pedicel. Tepals 5, green-white or pink; outer tepals spreading in fruit, reniform-orbicular, ca. 4 × 6 mm, prominently reticulate-veined; inner tepals ovate, unequal, 7–8 mm in diam., prominently reticulated-veined, margin undulate. Achenes dark brown, shiny, ovoid-trigonal, ca. 5 mm, smooth. Fl. and fr. Jun–Aug.

Semimobile to stable sand dunes; 100–1500. Gansu, Nei Mongol, Ningxia, Qinghai, Shaanxi, Xinjiang [Mongolia].

One of us (Grabovskaya-Borodina) questions whether this is a good species.


Atraphaxis bracteata var. angustifolia Losinskaja; A. bracteata var. latifolia H. C. Fu & M. H. Zhao.

Shrubs 1–1.5 m tall. Stem erect, light brown, stout, glabrous; woody branches inclined-spreading, brown, much branched, smooth and glabrous, apex with leaves and flowers. Petiole very short, 1.5–3 mm, glabrous; leaf blade oblong, elliptic, or lanceolate on branchlets of current year, 1.5–3.5 × 0.8–2 cm, leathery, both surfaces glabrous, base rounded or broadly wedge-form, margin slightly undulate, apex obtuse, with a short point; ocrea cylindric, 6–8 mm, membranous, oblique in upper part and cleft into 2 sharp teeth. Racemes terminal on branchlets of current year; bracts lanceolate, ca. 4 mm, membranous, with brown midvein, 2- or 3-flowered. Pedicel ca. 4 mm, jointed at above portion of pedicel. Tepals 5, green-white or pink; outer tepals spreading in fruit, reniform-orbicular, ca. 4 × 6 mm, prominently reticulate-veined; inner tepals ovate, unequal, 7–8 mm in diam., prominently reticulated-veined, margin undulate. Achenes dark brown, shiny, ovoid-trigonal, ca. 5 mm, smooth. Fl. and fr. Jun–Aug.

Semimobile to stable sand dunes; 100–1500. Gansu, Nei Mongol, Ningxia, Qinghai, Shaanxi, Xinjiang [Mongolia].

One of us (Grabovskaya-Borodina) questions whether this is a good species.