

**84. APIOS** Fabricius, Enum. 176. 1759, nom. cons.

土圀儿属 tu luan er shu

Sa Ren (萨仁); Michael G. Gilbert

Herbs, twining, with root tubers. Leaves pinnately (3 or)5- or 7(or 9)-foliolate; stipels small. Inflorescence axillary or subterminal and grouped into terminal panicle, racemelike; nodes swollen. Bracts and bracteoles small, caducous. Calyx campanulate; lobes shorter than tube, upper 2 connate, lowest 1 linear and other 2 much shorter. Standard ovate or circular, reflexed; wings obliquely obovate, shorter than standard; keels longest and inflexed or coiled. Stamens diadelphous; vexillary stamen free; anthers uniform. Ovary subsessile; ovules many, upper part reflexed, usually thickened, glabrous; stigma terminal. Legume linear, almost falcate, dehiscent, compressed, 2-cleft. Seeds without strophiole.

About eight species: mostly in E Asia, two species in E North America; six species (four endemic) in China.

- 1a. Flower red, reddish purple, or orange; leaflets usually more than 5 cm ..... 6. *A. carnea*
- 1b. Flower green, yellow, or purple; leaflets usually less than 5 cm.
  - 2a. Leaflets 0.5–1.9 cm wide; inflorescences shorter than or subequal to leaves.
    - 3a. Leaflet 0.5–1.2 cm wide; flowers purple ..... 5. *A. gracillima*
    - 3b. Leaflet 1.1–1.9 cm wide; flowers pale yellow ..... 4. *A. delavayi*
  - 2b. Leaflets usually more than 2 cm wide; inflorescences longer than leaves.
    - 4a. Leaflets ovate or rhomboid-ovate, usually 3–7 ..... 1. *A. fortunei*
    - 4b. Leaflets usually lanceolate, narrowly lanceolate, or ovate-lanceolate, 5 or 7.
      - 5a. Leaflets lanceolate to ovate-lanceolate; inflorescence with 2 flowers per node ..... 2. *A. macrantha*
      - 5b. Leaflets ovate-lanceolate to ovate; inflorescence with 3 or 4 flowers per node ..... 3. *A. taiwaniana*

**1. *Apios fortunei*** Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg 18: 396. 1873.

土圀儿 tu luan er

*Apios cavaleriei* H. Léveillé.

Herbs, twining. Root tuber spherical or ovoid. Stems slender, sparsely hirsute. Leaves pinnately 3–7-foliolate, 10–25 cm; stipules linear-triangular, to 4 mm, very inconspicuous; petiole 3–6.6 cm, glabrous; stipels inconspicuous; petiolules sometimes hairy; leaflets ovate or rhomboid-ovate, 3–7.5 × 1.5–4 cm, papery, abaxially sparsely hirsute, adaxially glabrous, base broadly cuneate or rounded, apex acute, mucronate. Raceme axillary, 6–26 cm; bracts and bracteoles minute, lanceolate, ciliate, deciduous. Calyx bowl-like, shallowly 2-lipped. Corolla yellowish green or light green; standard orbicular, 1–1.5 cm; wings almost half as long as standard; keels much longer than standard, curled into semicircle. Ovary sparsely shortly hairy; style coiled, glabrous. Legume light brown, ca. 8 × 0.6 cm, glabrous, compressed. Fl. Jun–Aug, fr. Sep–Oct.

Mountain slopes; 300–1000 m. Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Zhejiang [Japan].

The root tuber is a source of starch, sometimes used to make alcohol.

**2. *Apios macrantha*** Oliver, Hooker's Icon. Pl. 20: t. 1946. 1890.

大花土圀儿 da hua tu luan er

Vines. Stems slender, twining, glabrous or almost glabrous except for nodes. Leaves pinnately 5- or 7-foliolate, 15–20 cm; stipules deciduous, triangular, ca. 4 mm, pilose; petiole 2.5–5.5 cm, glabrous; stipels deciduous; petiolules ca. 2 mm, hirsute;

leaflets lanceolate to ovate-lanceolate, ca. 5.5 × 2.2–3.2 cm, papery, both surfaces glabrous, lateral veins ca. 5 on each side, slender, base broadly cuneate to almost rounded, apex acuminate, mucronate. Raceme longer than leaves, pedunculate, with 2 flowers per node. Upper lip of calyx entire, ovate-orbicular, apex mucronate, lateral lobes obliquely lanceolate, apex acuminate, bottom lobe ovate. Corolla yellow or light green; standard 1.7–2 cm; wings almost half as long as standard; keels longest, curved into semicircle. Ovary stipitate, pilose, 8-ovuled. Legume ca. 15 × 0.7 cm, beltlike, compressed, sparsely shortly villous. Fl. Aug–Sep, fr. Sep–Oct.

• River valleys, roadsides; 1800–2400 m. Guizhou, Sichuan, Xizang, Yunnan.

**3. *Apios taiwaniana*** Hosokawa, J. Soc. Trop. Agric. 4: 310. 1932.

台湾土圀儿 tai wan tu luan er

Herbs, twining, like shrublets. Stems sparsely villous. Leaves pinnately (5 or)7-foliolate; petiole 5–12 cm, glabrous; stipels 1.5–2 mm, hirsute; petiolules ca. 2 mm, with fine downy hairs; leaflets ovate or ovate-lanceolate, 4–5 × 1.5–2.2 cm, both surfaces almost glabrous, base rounded or cuneate, apex obtuse or acuminate, mucronate. Raceme to 15 cm; nodes 3- or 4-flowered. Flowers yellowish light purple, ca. 1.2 cm. Calyx lobes subequal. Standard suborbicular, ca. 1.1 cm; wings narrowly oblong; keels extending, inflexed. Ovary shortly velutinous; style twisted. Legume not seen.

• 700–1500 m. Taiwan.

**4. *Apios delavayi*** Franchet, Pl. Delavay. 180. 1890.

云南土圀儿 yun nan tu luan er

Herbs. Stems twining, slender, almost glabrous. Leaves

pinnately 5-foliolate, 8–32 cm; stipules subulate, sparsely pubescent, 2–6 mm; petiole 2–8 cm, almost glabrous; petiolules sericeous; leaflets ± lanceolate, 2–5 × 1.1–1.9 cm, papery, both surfaces sparsely hirsute, base orbicular, margin shortly ciliate, apex acuminate, mucronate. Raceme shorter than to sometimes slightly longer than leaves, sparsely 5–10-flowered; peduncle 2.5–6 cm; nodes 1–3-flowered. Calyx broadly campanulate, ca. 1/6 as long as corolla, membranous, 2-lipped; upper 2 lobes connate into triangle, mucronate, lateral 2 lobes linear-subulate, bottom lobe broadly triangular, inflexed, mucronate. Corolla light yellow, ca. 2 cm; standard orbicular; keels narrow, slightly longer than standard. Legume to 15 cm, linear, erect, glabrous, compressed. Seeds up to 12. Fl. Jul–Aug, fr. Sep.

- Shrublands; 1300–3500 m. Sichuan, Xizang, Yunnan.

**5. *Apios gracillima*** Dunn, J. Linn. Soc., Bot. 35: 488. 1903.

纤细土圞儿 xian xi tu luan er

Herbs. Stems twining, slender, sometimes hairy on nodes. Leaves pinnately 5- or 7-foliolate, 5–10 cm, glabrous or shortly pubescent at base of petiole; stipules setiform, 1–3 mm, hairy; petiole 1.8–3 cm; glabrous; leaflets oblong-linear or narrowly lanceolate, 2–4.5 × 0.5–1.2 cm, membranous, both surfaces glabrous, base rounded, apex mucronate. Inflorescences shorter than leaves; peduncle 1.5–2.5 cm. Flowers at top of common

pedicel, usually paired, 1.2–1.5 cm. Lateral calyx lobes acuminate, reflexed, lower lobes almost triangular. Corolla purple; standard orbicular; keel apex inflexed. Ovary shortly villous. Fl. Aug–Oct.

- About 1500 m. Yunnan (Mengzi).

**6. *Apios carnea*** (Wallich) Bentham ex Baker in J. D. Hooker, Fl. Brit. India 2: 188. 1876.

肉色土圞儿 rou se tu luan er

*Cyrtotropis carnea* Wallich, Pl. Asiat. Rar. 1: 50. 1830.

Vines, 3–4 m. Stems twining, slender, hairy when young. Leaves pinnately 5-foliolate, 12–25 cm; stipules narrowly triangular, 2–4 mm, hairy, caducous; petiole 5–8(–12) cm, glabrous; leaflets oblong to ovate-oblong, 3.5–13 × 2–7 cm, papery, glabrous, base obliquely cuneate to nearly rounded, apex acuminate or acute, shortly caudate. Raceme 15–40 cm; peduncle 4–20 cm; nodes 2- or 3-flowered. Bracts and bracteoles small, linear, deciduous. Calyx campanulate, 2-lipped; lobes triangular, shorter than tube. Corolla red, reddish purple, or orange, ca. 2 × as long as calyx; standard longest, 1–2 cm; wings shortest, 0.6–1.2 cm; keels linear, curved to semicircular. Filament to 2 cm. Style curved to circular or semicircular. Legume linear, 8–19 × 0.6–0.7 cm, straight or slightly curved, compressed, glabrous, apex beaked. Seeds 12–21, dark brown, reniform, lustrous. Fl. Jul–Sep, fr. Aug–Nov.

Forests, riversides, roadsides, rocks; 600–2600 m. Fujian, Guangxi, Guizhou, Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, N India, Nepal, Thailand, Vietnam].

The seeds contain oil.

