

4. SANICULA Linnaeus, Sp. Pl. 1: 235. 1753.

变豆菜属 *bian dou cai shu*

She Menglan (余孟兰 *Sheh Meng-lan*); Loy R. Phillippe

Herbs biennial or perennial. Stem erect, ascending or rarely decumbent, glabrous (Chinese species). Leaves petiolate, sheaths generally membranous, or subsessile; blade orbicular, round-cordate or cordate-pentagonal, palmately 3–5-parted and often lobed, margin serrate or doubly setose-serrate. Umbels simple or compound; peduncles racemous, cymous or corymbose-branched; bracts foliaceous, usually serrate; bracteoles small, entire, rarely lobed; umbellules with both sessile or subsessile, bisexual flowers and pedicellate, staminate flowers. Calyx teeth prominent, connate and persistent. Petals white, greenish white, pale yellow, purple or pale blue, spatulate or obovate with a narrowly inflexed apex. Stylopodium absent or discoid-flat; styles shorter than or exceeding the calyx teeth, recurved. Fruit long-ellipsoid or subglobose, densely covered with uncinatate or straight bristles, or tubercles; ribs inconspicuous or slightly prominent; vittae distinct or obscure, irregularly arranged on the dorsal and lateral surfaces, usually 3 on commissure. Seed-face concave or sulcate. Carpophore absent.

About 40 species: predominately in temperate regions, some species in subtropical regions; 17 species (11 endemic) in China.

- 1a. Stem and inflorescence unbranched; umbels terminal; staminate flowers 9–20 per umbellule.
 - 2a. Leaf blade usually shallowly 3–5-parted, rarely deeply divided; bracts shorter than the umbel; fruit covered with tubercles and scales, never with spines or bristles 3. *S. hacquetioides*
 - 2b. Leaf blade palmately 3-parted; bracts longer than or equaling the umbel; fruit covered with bristles or tubercles.
 - 3a. Leaf blade sharply serrate, teeth spinulose; central rays 5–15 cm; fruit with bristles 1. *S. rubriflora*
 - 3b. Leaf blade finely serrate, teeth not spinulose; central rays 0.5–3.5 cm; fruit with tubercles or spinules 2. *S. tuberculata*
- 1b. Stem and inflorescence branched; umbels terminal and lateral; staminate flowers 2–8 per umbellule.
 - 4a. Fertile flowers (1–)2–5 per umbellule; fruit densely covered with uncinatate bristles or tubercles.
 - 5a. Inflorescence short, branches few, 1–4, to 1.5 cm.
 - 6a. Staminate flowers 5–7 per umbellule; fertile flowers 1 or 2 5. *S. serrata*
 - 6b. Staminate flowers 2 or 3 per umbellule; fertile flowers 2 or 3 11. *S. rugulosa*
 - 5b. Inflorescence elongate, branches numerous, more than 1.5 cm.
 - 7a. Leaf blade deeply divided to 2/3–4/5, bases of central and lateral segments connected 12. *S. astrantiifolia*
 - 7b. Leaf blade 3–5-parted, bases of central and lateral segments separate or nearly so.
 - 8a. Rays very short, ca. 5 mm 13. *S. elata*
 - 8b. Rays rather long, 5–20 mm.
 - 9a. Calyx teeth linear, ca. 1.2 × 0.5 mm; styles equaling (rarely exceeding) calyx teeth, slightly recurved 14. *S. chinensis*
 - 9b. Calyx teeth ovate, ca. 0.5 × 0.3 mm; styles 2–3-times longer than the calyx teeth, recurved 15. *S. giraldii*
 - 4b. Fertile flowers 1 per umbellule (1–3 in *S. caerulescens*); fruit with straight bristles, spines or scales.
 - 10a. Leaf blade 3-parted, segments entire.
 - 11a. Plants 20–50 cm high; stem erect; leaves more than 5 cm wide; peduncles elongate, cymose-branched 16. *S. pengshuiensis*
 - 11b. Plants to 25 cm high; stem decumbent; leaves less than 5 cm wide; peduncles short, subracemose 17. *S. oviformis*
 - 10b. Leaf blade palmately 3–5-parted, segments usually 2–3-lobed.
 - 12a. Inflorescence subracemose; lateral umbels without peduncles, in fascicles 7. *S. caerulescens*
 - 12b. Inflorescence paniculate or subcorymbose; lateral umbels with distinct peduncles.
 - 13a. Leaves small, less than 2 × 3 cm; fruit furrows smooth, ribs bearing spiny crests 8. *S. petagnioides*
 - 13b. Leaves large, more than 2 × 3.5 cm; fruit densely covered with spines, scales or tubercles.
 - 14a. Inflorescence branches very slender, elongate; bracts ca. 0.5 mm; calyx teeth ca. 0.3 mm 6. *S. elongata*
 - 14b. Inflorescence branches stout, not elongate; bracts 1.5–3 mm; calyx teeth 0.6–1 mm.
 - 15a. Calyx teeth ovate, ca. 0.6 mm; fruit densely covered with scales and tubercles 4. *S. tienmuensis*
 - 15b. Calyx teeth linear or narrowly linear, 0.5–1 mm; fruit densely covered with spines or erose lamellae.
 - 16a. Lateral segments of leaves oblique-ovate, shallowly 2-lobed or serrate-lobed; styles ca. 1.5 mm 9. *S. lamelligera*
 - 16b. Lateral segments of leaves oblique-obovate, deeply divided to base; styles 3.5–4 mm 10. *S. orthacantha*

1. *Sanicula rubriflora* F. Schmidt ex Maximowicz, Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans 9 [Prim. Fl. Amur.]: 123. 1859.

红花变豆菜 hong hua bian dou cai

Plants up to 1 m high. Taproot bearing fibrous or fleshy-fibrous roots. Stem erect, unbranched. Basal leaves numerous; petiole 13–55 cm; blade round-cordate or reniform-orbicular, 3.5–10 × 6.5–12 cm, palmately 3-parted, segments shallowly 2–3-lobed and setose-serrate; central segment obovate, base cuneate; lateral segments broad-obovate, usually parted to the middle or below. Bracts 2, foliaceous, 3-parted; rays 3; bracteoles 3–7, oblanceolate or linear, 7–35 × 3–6 mm, entire or 1–3-serrate; umbellules many-flowered. Staminate flowers 15–20 per umbellule, pedicellate; calyx teeth ovate-lanceolate, 1.2–1.8 × 0.6–1 mm, midrib conspicuous; petals pinkish to purple, base attenuate, apex notched. Fertile flowers 3–5 per umbellule, subsessile; calyx teeth and petals as in staminate flowers; styles about 2 times as long as the calyx teeth, recurved. Fruit ovoid or ovoid-globose, ca. 4.5 × 4 mm, densely covered with yellow, uncinatate bristles; vittae 5. Fl. and fr. Jun–Sep.

Shady wet places; 200–500 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia (E Siberia)].

This species has reputed medicinal value.

2. *Sanicula tuberculata* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 2: 431. 1867.

瘤果变豆菜 liu guo bian dou cai

Plants 12–15 cm high. Taproot bearing numerous dark brown fibrous roots. Stem erect, unbranched. Basal leaves several; petiole 5–15 cm; blade cordate to reniform, 2–3.5 × 4–7 cm, 3-parted, segments distally irregularly serrulate; central segment obovate, base cuneate, midrib elongate to tip, apex acute to subtruncate, usually shallowly 3-lobed; lateral segments broadly obovate or oblique-rounded, parted to middle or below. Bracts 2, opposite, foliaceous, 2–3-parted, lobes obovate, 2.5–3.5 × 1–2 cm, serrulate; rays 3, 0.5–3.5 cm; bracteoles 3–6, narrowly lanceolate or linear, 0.5–1.5 mm, entire or 1–2-serrate; umbellules many-flowered. Staminate flowers ca. 20 per umbellule, pedicels ca. 2 mm; calyx teeth ovate or ovate-lanceolate; petals purplish red. Fertile flowers 3 per umbellule, sessile; calyx teeth narrowly deltoid ca. 2 mm; petals ca. 2 × 1 mm; styles about 2 times as long as calyx teeth, recurved. Fruit ovoid-globose, ca. 4.5 × 4 mm, covered with tubercles and straight or slightly curved spinules; vittae 5. Fl. May.

Wet valleys, swamps, roadsides; 200–600 m. Heilongjiang [S Japan, Korea].

3. *Sanicula hacquetioides* Franchet, Bull. Soc. Philom. Paris, sér. 8, 6: 110. 1894.

鳞果变豆菜 lin guo bian dou cai

Plants 5–30 cm high. Roots fibrous, sometimes with long creeping rhizomes. Stem slender, unbranched. Basal leaves several; petiole 3–22 cm; blade orbicular or cordate-rounded, (1–) 1.5–3(–3.5) × 2–4(–7) cm, palmately deeply 3-parted, serrulate; central segment broadly obovate, base cuneate, apex subtrun-

cate, shallowly 3-lobed; lateral segments rhombic-obovate, 2-lobed. Inflorescence terminal; bracts 2–3, opposite, foliaceous, sessile, 1–1.5 × 0.5–1 cm, 3-parted, segments obovate or lanceolate; rays 3–4, subequal, 0.5–2.5 cm; bracteoles ca. 10, lanceolate or ovate-lanceolate; umbellules 10–15-flowered. Staminate flowers 9–14 per umbellule; pedicels ca. 2 mm; petals white or pinkish, obovate, base tapering, apex deeply notched. Fertile flowers 1–3 per umbellule, sessile; calyx teeth broadly ovate or obovate, ca. 0.5 mm; styles about 1.5 times as long as petals, recurved. Fruit ovoid-globose, 2–2.5 × 2.5–3 mm, covered with scales and tubercles, but never spinulose; vittae obscure. Fl. and fr. May–Sep.

• Forests, mountain slopes, grassy places on stream banks; 2600–3800 m. Guizhou, Sichuan, Xizang, Yunnan.

This species has reputed medicinal value.

4. *Sanicula tienmuensis* R. H. Shan & Constance, Univ. Calif. Publ. Bot. 25: 23. 1951.

天目变豆菜 tian mu bian dou cai

Plants 20–30 cm high. Rootstock short, dark brown, bearing numerous fleshy-fibrous roots. Stems 2–5, branched. Basal leaves several; petioles 7–22 cm; blade round-cordate to orbicular, 3–5.5 × 5–9 cm, palmately 3-parted, primary segments shallowly 2–3-lobed, sharply serrate; central segment obovate, 3–5.5 × 1.5–3 cm; lateral segments broadly obovate, usually parted to middle or near base. Peduncles 1–3-trichotomously branched, central branch usually with a simple umbel, lateral branches longer, with compound umbels; bracts 2, opposite, linear or ovate, 2–3-lobed; rays 3–5, unequal, 3–15 mm; bracteoles 7, ovate, ca. 1 × 0.5 mm; umbellules 3–7-flowered. Staminate flowers 2–6 per umbellule; petals white. Fertile flowers 1 per umbellule, sessile; calyx teeth ovate, ca. 0.6 × 0.5 mm; styles 2–3 mm, recurved. Fruit subglobose, ca. 2.5 × 2 mm, densely covered with scales and tubercles; vittae obscure. Fl. and fr. Apr–May.

• Woods in valleys, forest margins, wet places on stream banks, roadsides; 500–2300 m. W Sichuan, Zhejiang.

- 1a. Staminate flowers 5 or 6 per umbellule 4a. var. *tienmuensis*
- 1b. Staminate flowers 2 or 3 per umbellule 4b. var. *pauciflora*

4a. *Sanicula tienmuensis* var. *tienmuensis*

天目变豆菜(原变种) tian mu bian dou cai (yuan bian zhong)

Staminate flowers 5 or 6 per umbellule.

• Forest margins, wet places on stream banks, roadsides; 500–800 m. Zhejiang (W Tianmu Shan, Tiantai Shan).

4b. *Sanicula tienmuensis* var. *pauciflora* R. H. Shan & F. T. Pu, Acta Phytotax. Sin. 27: 66. 1989.

疏花变豆菜 shu hua bian dou cai

Staminate flowers 2 or 3 per umbellule.

• Woods in valleys; ca. 2300 m. W Sichuan (Luding).

5. *Sanicula serrata* H. Wolff in Engler, Pflanzenr. 61(IV. 228):

56. 1913.

锯叶变豆菜 *ju ye bian dou cai*

Plants 8–30 cm high. Rootstock short bearing fibrous roots. Stem slender, erect, unbranched. Basal leaves several; petioles 5–15 cm; blade subrounded, round-cordate or subpentagonal, 1.5–3 × 3–6 cm, palmately 3–5-parted; central segment broadly obovate or cuneate-obovate, 1.5–3 × 1–2.5 cm, base attenuate, apex shallowly 3-lobed, margin irregularly sharply serrate. Cauline leaves sessile or petiolate, palmately 3–5-parted. Bracts 2, opposite, long-ovate or ovate-lanceolate; rays 3–5 mm; bracteoles small, linear; umbellules 6–8-flowered. Staminate flowers 5–7 per umbellule; pedicels 1.5–2.5 mm; petals white or pinkish, broadly obovate, apex notched. Fertile flowers 1 or 2 per umbellule, sessile; calyx teeth ovate, ca. 0.5 × 0.3 mm; styles 2–2.5 mm, recurved. Fruit ovoid or ovoid-globose, ca. 1.2 × 1 mm, proximal part covered with scales, distal part covered with slightly uncinat bristles, bristles pale yellow or purplish red; vittae obscure. Fl. and fr. Mar–Jun.

• Mixed forests on mountain slopes; 1300–3200 m. W Hubei, E Qinghai, Sichuan, SE Xizang, NW Yunnan.

6. *Sanicula elongata* K. T. Fu in R. H. Shan & M. L. Sheh, Fl. Reipubl. Popularis Sin. 55(1): 297. 1979.

长序变豆菜 *chang xu bian dou cai*

Plants 35–40 cm high. Fibrous roots brown and numerous. Stems 2 or 3, erect. Basal leaves several; petioles 4–15 cm; leaf blade subrounded, round-cordate or pentagonal, 4–22 cm, palmately 3–5-parted, margin sharply irregular-serrate; central segment cuneate-obovate or ovate, 1.5–7 × 1.2–4.5 cm; lateral segments parted nearly to base, base cuneate. Cauline leaves sessile or short-petiolate; blade palmately 3–5-parted. Peduncles 2–3-trichotomously branched, slender and elongate; bracts small, long-ovate, ca. 0.5 mm; rays 0.8–2 cm; umbellules 4–6-flowered. Staminate flowers 3–5 per umbellule; pedicels ca. 3 mm; petals white, broadly obovate. Fertile flowers 1 per umbellule, sessile; calyx teeth narrow-ovate, ca. 0.3 mm; styles 2–2.5 mm, recurved. Fruit ovoid, ca. 3 × 2.5 mm, densely covered with pale yellow scales; vittae obscure. Fl. May, fr. Jun–Jul.

• Mixed forests in valleys; 1200–1600 m. Gansu (Tianshui), Shaanxi (Meixian).

7. *Sanicula caerulescens* Franchet, Bull. Soc. Philom. Paris, sér. 8, 6: 109. 1894.

天蓝变豆菜 *tian lan bian dou cai*

Sanicula dielsiana H. Wolff; *S. erythrophylla* Bobrov; *S. stapfiana* H. Wolff.

Plants to 40 cm high. Taproot slender, bearing fibrous roots. Stems 2–7, erect. Basal leaves many; petioles purplish tinged, 5–17 cm; blade cordate-ovate, 3–7 × 4–10 cm, palmately 3–5-parted or trifoliolate; central segment ovate, 3–7 × 1.5–4.5 cm, base cuneate, apex shallowly 3-lobed; lateral segments oblique-ovate, usually 2-lobed, abaxially purplish red or tawny, margin crenate with spinulose bristles. Inflorescence subracemose, sometimes several umbels in fascicles; bracts ovate-lanceolate, 1–2 mm; rays 2–7(–12), 0.5–1 cm; bracteoles

5–8, linear ca. 1 × 0.5 mm; umbellules 5–7-flowered. Staminate flowers 4–6 per umbellule, pedicels 2–3 mm; petals white, pale blue to bluish purple. Fertile flowers 1–3 per umbellule, sessile; calyx teeth linear-lanceolate, acute; styles 2.5–3 mm, recurved. Fruit globose or ellipsoid, ca. 2 mm, covered with short and straight spinous-bristles usually fused at the base forming a thin tier; vittae 5, under the ribs; mericarp flattened dorsally, orbicular in cross section. Fl. and fr. Mar–Jul.

• Mixed forests or bamboo forests in wet shady valleys; 800–1600 m. Chongqing (Nanchuan), SC Sichuan (Emei Shan), Yunnan.

This species has reputed medicinal value.

8. *Sanicula petagnioides* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 25: 103. 1908.

台湾变豆菜 *tai wan bian dou cai*

Plants 10–15 cm high. Rootstock short, woody, bearing thinly fibrous roots, sometimes with rhizome or stolons. Stems 1–3, very slender. Basal leaves few; petioles 3–7 cm; blade reniform-orbicular or cordate-pentagonal, 1–2 × 2–3 cm, palmately 3–5-parted or foliolate; central segment broadly obovate or rhombic-obovate, short-petiolate, apex shallowly 3-lobed, sharply serrate, teeth mucronate to spinulose; lateral segments parted to base, trilobulate or entire, base cuneate. Cauline leaves reduced, subsessile, often 3-lobed. Inflorescence terminal, dichotomously branched, umbels 4–8; bracts linear, ca. 1 × 0.5 mm; rays 3–5 mm; umbellules 5–6-flowered. Staminate flowers 4–5 per umbellule, pedicels 1–2 mm; petals white. Fertile flowers 1 per umbellule, sessile; calyx teeth linear-lanceolate, ca. 1 × 0.3 mm; styles ca. 2 mm. Fruit subglobose, 1.5–2 × 1–1.5 mm; ribs bearing spiny crests, furrows smooth; vittae obscure. Fl. and fr. Mar–Oct.

• Forests on mountain slopes; 2500–2700 m. Taiwan.

9. *Sanicula lamelligera* Hance, J. Bot. 16: 11. 1878.

薄片变豆菜 *bao pian bian dou cai*

Sanicula ichangensis H. Wolff; *S. orthacantha* S. Moore var. *longispina* H. Wolff; *S. satsumana* Maximowicz; *S. yunnanensis* Franchet.

Plants 13–30 cm high. Rootstock short, tuberlike, woody, bearing a fascicle of brown fibrous roots. Stems 2–7, slender, erect. Basal leaves several; petioles 4–18 cm; blade round-cordate, 2–6 × 3–9 cm, palmately 3-parted; central segment cuneate-obovate or rhombic, 2–6 × 1–3 cm, distally 3-lobed, base cuneate; lateral segments oblique-ovate often shallowly 2-lobed; all segments abaxially pale green or purplish red. Upper leaves very small, 3-lobed or undivided, linear-lanceolate. Inflorescence 2–4-dichotomously or trichotomously branched, sometimes subcorymbose; bracts small, linear, 1.5–3 mm; rays 3–7, 2–10 mm; bracteoles 4–5, linear; umbellules 5–6-flowered. Staminate flowers 4–5 per umbellule; petals white, pinkish or pale bluish purple. Fertile flowers 1 per umbellule; calyx teeth linear, ca. 1 mm; styles ca. 1.5 mm, recurved. Fruit long-ovoid, ca. 2.5 × 2 mm, covered with erose lamellae, becoming short and straight spines when mature, never uncinat, fused at the base forming a thin tier; vittae 5. Fl. and fr. Apr–Nov.

Forests, mountain slopes, wet valleys; 500–2000 m. Anhui, Guangdong, Guangxi, Guizhou, Hubei, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [S Japan].

10. *Sanicula orthacantha* S. Moore, J. Bot. 13: 227. 1875.

野鹅脚板 ye e jiao ban

Plants 8–35(–50) cm high. Rootstock short, tuberlike, woody, bearing a fascicle of thinly fibrous roots. Stems 1–6, erect. Basal leaves several; petioles 5–26 cm; blade round-cordate or cordate-pentagonal, 2–7 × 3.5–7 cm, palmately 3-parted or foliolate; central segment cuneate-obovate or rhombic-cuneate, 2–7 × 1–4 cm; lateral segments oblique-obovate, usually parted to base, base cuneate; all segments abaxially pale green and pale purplish red along veins, distally shallowly 2–3-lobed, serrate, teeth mucronate to spinulose. Cauline leaves small, petiolate, 3-lobed. Inflorescence 2–3-branched; umbels 3–8; bracts 3–5, 1–2.5 mm, unequal; rays 3–8 mm; bracteoles 5, linear to subulate; umbellules 6 or 7-flowered. Staminate flowers 5(or 6) per umbellule, pedicels 2–3.5 mm; petals white, pale blue or purplish red, obovate, 1–1.8 × 0.8–1.2 mm. Fertile flowers 1 per umbellule, sessile; calyx teeth narrow-linear, 0.5–1 mm; styles 3.5–4 mm, recurved. Fruit ovoid, 2.5–3 × 2–2.5 mm, covered with short, straight spines; vittae obscure. Fl. and fr. Apr–Sep.

Forests, mountain summits, stream banks, roadsides on mountain slopes; 200–3200 m. Anhui, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang [Cambodia, India, Laos, Vietnam].

- 1a. Rhizome long 10c. var. *stolonifera*
- 1b. Rhizome short.
 - 2a. Flowers 5 per umbellule; fruit ribs and furrows spinulose 10a. var. *orthacantha*
 - 2b. Flowers 6 or 7 per umbellule; fruit ribs erose-spinulose, furrows tuberculate 10b. var. *brevispina*

10a. *Sanicula orthacantha* var. *orthacantha*

野鹅脚板(原变种) ye e jiao ban (yuan bian zhong)

Sanicula costata H. Wolff; *S. orthacantha* var. *costata* (H. Wolff) K. T. Fu; *S. orthacantha* var. *pumila* H. de Boissieu; *S. henryi* H. Wolff; *S. nanchuanensis* R. H. Shan.

Roots fibrous, without rhizome. Inflorescence rather short; usually 5 flowers per umbellule. Fruit spines straight, covering ribs and furrows.

Forests in valleys, stream banks; 200–3200 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang [Cambodia, India, Laos, Vietnam].

This variety is used medicinally in Sichuan and Yunnan.

10b. *Sanicula orthacantha* var. *brevispina* H. de Boissieu, Bull. Soc. Bot. France 53: 421. 1906.

短刺鹅脚板 duan ci e jiao ban

Roots fibrous, without rhizome. Inflorescence elongate, loose and spreading; 6 or 7 flowers per umbellule. Fruit erose-spinose on the ribs, tuberculate in the furrows.

• Forests, roadsides on mountain slopes; 1700–2400 m. Chongqing (Jinfo Shan), SC Sichuan (Emei Shan).

This variety has reputed medicinal value.

10c. *Sanicula orthacantha* var. *stolonifera* R. H. Shan & S. L. Liou in R. H. Shan & M. L. Sheh, Fl. Reipubl. Popularis Sin. 55(1): 297. 1979.

走茎鹅脚板 zou jing e jiao ban

Rhizome long, with distinct nodes.

• Mountain summits; 2300–2500 m. SC Sichuan (Emei Shan).

11. *Sanicula rugulosa* Diels, Bot. Jahrb. Syst. 29: 491. 1901.

皱叶变豆菜 zhou ye bian dou cai

Plants 25–40(–75) cm high. Rootstock short and stout, roots fascicled, fibrous, somewhat fleshy. Stem erect, branched above. Basal leaves several; petioles 6–18 cm, sheaths scarious; blade orbicular, reniform-rounded or broadly cordate, 2–3 × 3–5.5 cm, 3-parted; central segment broadly obovate, distally shallowly 3-lobed, base cuneate, apex obtuse-rounded; lateral segments rhombic-rounded or broadly obovate, 2–3-lobed; all segments abaxially pale purplish red, crenate, primary veins 5, prominent on both surfaces. Cauline leaves reniform-rounded, 3-parted, primary veins 3. Inflorescence 2–3-dichotomously branched; bracts 1–2, 3-parted, segments lanceolate, serrate; rays 0.7–2 cm; bracteoles linear; umbellules 5–7-flowered. Staminate flowers 2 or 3 per umbellule, pedicels ca. 2 mm; petals white, obovate, apex inflexed. Fertile flowers 2 or 3 per umbellule, sessile; calyx teeth narrowly lanceolate, ca. 1 mm; styles longer than the petals, recurved. Fruit ellipsoid, ca. 1.5 × 1 mm, densely covered with uncinat bristles when mature; vittae obscure. Fl. and fr. Jun.

• Grassy places or rock crevices on mountain slopes; 800–2500 m. Chongqing (Jinfo Shan), Xizang.

12. *Sanicula astantiifolia* H. Wolff, Repert. Spec. Nov. Regni Veg. 27: 308. 1930.

川滇变豆菜 chuan dian bian dou cai

Sanicula potaninii Bobrov.

Plants 20–70 cm high. Taproot short and stout, roots numerous, fibrous. Stem erect, 2–4-times-dichotomously branched above. Basal leaves several; petioles 5–16(–30) cm; blade round-reniform or broadly ovate-cordate, 2–8 × 2.5–14 cm, palmately deeply 3-parted, primary veins 3–5, prominent on both surfaces, abaxially pale green, serrate or irregularly doubly spinose-serrate; central segment obovate or rhombic; lateral segments oblique-reniform or ovate-lanceolate, often 2-lobed. Upper leaves small, 3-parted, segments ovate-lanceolate. Inflorescence cymose branched; bracts 2, linear-lanceolate, 3–15 mm, 3-parted or entire; rays 0.5–1 cm; bracteoles 7–10, 1–1.5 × 0.5–1 mm, midrib distinct; umbellules ca. 10-flowered. Staminate flowers 6–8 per umbellule, pedicels short; petals greenish white or pinkish. Fertile flowers 2 or 3 per umbellule, sessile; calyx teeth linear-lanceolate, ca. 1 × 0.5 mm; styles ca. 2 mm, recurved. Fruit obovate or subglobose, proximal end with short bristles, distal end with uncinat bristles, bristles yel-

low or purple-red; vittae obscure. Fl. and fr. Jul–Oct.

• Stream banks in mixed forests, grassy places on mountain slopes; 1900–3000 m. SW Sichuan, S Xizang (Yadong), Yunnan.

This species is used medicinally in E Yunnan.

13. *Sanicula elata* Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 183. 1825.

软雀花 ruan que hua

Sanicula europaea Linnaeus subsp. *elata* (Buchanan-Hamilton ex D. Don) H. de Boissieu; *S. hermaphrodita* Buchanan-Hamilton ex D. Don; *S. montana* Reinwardt ex Blume.

Plants 20–80 cm high. Stem erect, branched above, upper parts purplish brown-tinged. Basal leaves several; petioles 5–25 cm; blade broadly ovate-cordate or subpentagonal, 3–7 × 4–10 cm, palmately 3(–5)-parted, irregularly serrate, teeth mucronate; central segment obovate or rhombic, shallowly 2–3-parted, base cuneate, apex acuminate; lateral segments oblique-ovate, often 2-parted. Cauline leaves short-petiolate; blade 3(–5)-parted, upper leaves greatly reduced. Inflorescence cymose branched, terminal branch often very short, lateral branches elongate; bracts 2, lanceolate; rays ca. 5 mm, unequal; bracteoles 7–10, linear; umbellules 4–8-flowered. Staminate flowers 1–4 per umbellule, pedicels 1–1.5 mm; petals white, pale yellow or pale blue. Fertile flowers 3(or 4) per umbellule; calyx teeth shorter than bristles, persistent; styles 2-times longer than calyx teeth, recurved. Fruit ovoid-globose, 2.5–3 × 2–2.5 mm, densely covered with uncinat bristles; vittae 5, small, commissural vittae 2, larger. Fl. and fr. May–Oct.

Forests, stream banks; 800–3200 m. Guangxi, Sichuan, Xizang, Yunnan [Bhutan, N India, Indonesia, Japan, Nepal, Malaysia, Myanmar, Pakistan, Philippines, Sri Lanka, Vietnam; E Africa].

The species has reputed medicinal value. It is a widespread and very variable species, and the leaf dissection tends to intergrade with that of *Sanicula astrantiifolia* in E Himalayan material.

14. *Sanicula chinensis* Bunge, Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans 2: 106. 1835.

变豆菜 bian dou cai

Sanicula europaea Linnaeus subsp. *chinensis* (Bunge) Hultén; *S. europaea* var. *chinensis* (Bunge) Diels.

Plants up to 1 m high. Stem erect, branched above. Basal leaves few; petioles 7–30 cm, sheaths scarious; blade suborbicular or round-reniform, 3–5-parted, abaxially pale green, irregularly doubly serrate, teeth mucronate; central segment obovate, 3–10 × 4–13 cm, base cuneate; lateral segments divided to near base. Cauline leaves reduced upward, subsessile; blade 3-parted. Inflorescence usually trichotomously branched, terminal branch short, the lateral branches elongate; bracts foliaceous, 3-lobed; bracteoles 8–10, linear, 1.5–2 × ca. 1 mm; umbellules 6–10-flowered. Staminate flowers 3–7 per umbellule; pedicels 1–1.5 mm; petals white, obovate. Fertile flowers 3 or 4 per umbellule, sessile, slightly longer than the staminate; calyx teeth linear, ca. 1.2 × 0.5 mm; style nearly equaling calyx teeth. Fruit ovoid-globose, 4–5 × 3–4 mm, calyx teeth rostrate, persistent, bristles uncinat above, dilated at base; vittae 5, moderate, commissural vittae 2, larger. Fl. and fr. Apr–Oct.

Mixed forests, stream banks, roadsides on shady slopes; 200–2300 m. Widely distributed in China [N Japan, Korea, Russia (E Siberia)].

This species has reputed medicinal value.

15. *Sanicula giraldii* H. Wolff in Engler, Pflanzenr. 61(IV. 228): 60. 1913.

首阳变豆菜 shou yang bian dou cai

Plants 30–60 cm high. Stems 1–4, erect, branched above. Basal leaves numerous; petioles 5–25 cm; blade reniform-orbicular or round-cordate, 2–6 × 3–10 cm, palmately 3–5-parted, irregularly doubly serrate, teeth acute or mucronate; central segment obovate or ovate-lanceolate, base cuneate, apex shallowly 3-lobed; lateral segments 2-parted. Cauline leaves palmately 3-parted, reduced above. Inflorescence 2–4-trichotomously branched, all branches elongate; bracts foliaceous, entire or 2–3-lobed; rays 2–4, 0.5–2 cm; bracteoles small, 1–1.2 × 0.5–0.7 mm; umbellules 6–7-flowered. Staminate flowers 3–5 per umbellule, petals white, broadly obovate. Fertile flowers 1–3 per umbellule; calyx teeth ovate, ca. 0.5 × 0.3 mm; style 2–3-times longer than calyx teeth, recurved. Fruit ovoid to broad-ovoid, 2–2.5 × 2.5–3 mm, densely covered with yellow or purplish red uncinat bristles; vittae obscure. Fl. and fr. May–Sep.

• Shady woods, forests and grassy places on mountain slopes, stream banks, roadsides; 1300–3400 m. Chongqing, Gansu, Hebei, Henan, Qinghai, Shaanxi, Shanxi, N and W Sichuan, S Xizang.

- 1a. Fertile flowers usually 3 per umbellule; calyx teeth small, ca. 0.5 × 0.3 mm 15a. var. *giraldii*
1b. Fertile flowers usually few, 1–3 per umbellule; calyx teeth larger, ca. 1 × 0.7 mm 15b. var. *ovicalycina*

15a. *Sanicula giraldii* var. *giraldii*

首阳变豆菜(原变种) shou yang bian dou cai (yuan bian zhong)

Fertile flowers usually 3 per umbellule. Calyx teeth ovate, ca. 0.5 × 0.3 mm. Fruit broadly ovoid, 2–2.5 × 2.5–3 mm.

• Forests on mountain slopes, stream banks, roadsides; 1500–3400 m. Gansu, Hebei, Henan, Qinghai, Shaanxi, Shanxi, N and W Sichuan, S Xizang.

15b. *Sanicula giraldii* var. *ovicalycina* R. H. Shan & S. L. Liou in R. H. Sheh & M. L. Shan, Fl. Reipubl. Popularis Sin. 55(1): 297. 1979.

卵萼变豆菜 luan e bian dou cai

Sanicula subgiraldii R. H. Shan

Fertile flowers 1–3 in each umbellule. Calyx teeth broadly ovate, ca. 1 × 0.7 mm. Fruit oblong, 2.5–3 × 3–3.5 mm.

• Shady woods, grassy places on mountain slopes; 1300–1600 m. Chongqing, Shaanxi.

16. *Sanicula pengshuiensis* M. L. Sheh & Z. Y. Liu, Acta Phytotax. Sin. 29: 469. 1991.

彭水变豆菜 peng shui bian dou cai

Plant 20–50 cm high. Rootstock short and thin, roots

fibrous. Stem erect. Basal leaves numerous; petioles 20–28 cm, purplish tinged, sheaths scarious-margined; blade suborbicular or broadly-ovate, palmately 3-parted, 5–10 × 5–9 cm, shallowly dentate, teeth spinulose; central segment long-elliptic or obovate-elliptic, base cuneate, apex acute, 5–10 × 2.5–3.5 cm; lateral segments oblique-elliptic. Inflorescence cymose branched, peduncles elongate; bracts 5 or 6, small, 1–1.5 × ca. 0.5 mm; rays 5–11, subequal, 2.6–6 mm; bracteoles 5, linear, 0.5–1 mm; umbellules 5–6-flowered. Staminate flowers 4 or 5 per umbellule, pedicels ca. 2 mm. Fertile flower 1 per umbellule, calyx teeth linear, ca. 0.8 mm; styles 3.5–4-times longer than the calyx teeth. Fruit ellipsoid, 2–2.5 × 1–1.7 mm, bristles in regular rows in furrows, ribs glabrous, stout and prominent; vittae 1 under each rib, 2 on commissure. Fl. and fr. Apr–Sep.

- Stream banks, fields; ca. 500 m. Chongqing (Pengshui).

17. *Sanicula oviformis* X. T. Liu & Z. Y. Liu, Acta Phytotax. Sin. 29: 471. 1991.

卵叶变豆菜 luan ye bian dou cai

Plants 12–25 cm high. Rootstock stout, short; roots numerous, thin-fibrous, usually bearing many tubercles. Stems 1–3, slender and decumbent, 20–40 cm. Basal leaves numerous; petioles 6–22 cm, sheaths scarious; blade broadly deltoid ovate, palmately 3-parted, 2–4 × 2.5–5 cm, abaxially deeply purplish red, reticulation conspicuous, margins narrowly rolled inward, 2–3-shallowly-crenate, teeth apiculate; central segment obovate or obovate-rounded, 1.2–2.5 × 1–2 cm, thin-leathery, base cuneate, apex obtuse; lateral segments oblique-ovate, base truncate. Inflorescence racemose branched or terminal, unbranched; bracts 3–5, subulate, unequal, rays 3, ca. 7 mm; bracteoles 5, subulate; umbellules ca. 6-flowered. Staminate flowers 5 per umbellule, pedicels ca. 2.5 mm. Fertile flower 1 per umbellule; calyx teeth linear-lanceolate, ca. 0.5 mm; styles ca. 2.5 mm. Fruit ovoid, ca. 2 × 1 mm, densely short and straight-spinulose; ribs prominent; vittae 1 under each rib, 2 on commissure. Fl. and fr. May–Jul.

- Moist grassy places; 600–700 m. Chongqing (Nanchuan).

