

96. HERACLEUM Linnaeus, Sp. Pl. 1: 249. 1753.

独活属 du huo shu

Pu Fading (溥发鼎 Pu Fa-ting); Mark F. Watson

Sphondylium Miller; *Tetrataenium* (de Candolle) Mandenova.

Herbs, perennial, rarely biennial. Root fusiform or cylindrical, thickened, rarely fibrous. Stem erect, terete and often ribbed or striate, branching. Basal and lower leaves petiolate; petiole sheaths usually conspicuously broad; blade ternately or pinnately compound, hairy or glabrous. Umbels loose compound, terminal and lateral, terminal umbel with bisexual flowers, the lateral often with only staminate flowers; bracts few or absent, often caducous; rays numerous, spreading-ascending; bracteoles several, linear or lanceolate, entire; umbellules many-flowered. Calyx teeth triangular, lanceolate or obsolete. Petals white, rarely pinkish or pale yellow, obovate or obcordate, base cuneate, apex notched with a narrowly incurved lobule; outer flowers of the umbel often radiant with outer petals enlarged, broadly obovate, apex deeply 2-lobed. Stylopodium conic; styles short, erect or reflexed. Fruit obovoid, ovoid, broadly ovoid or suborbicular, strongly dorsally compressed, hairy or glabrous; dorsal and intermediate ribs filiform, sometimes raised, lateral ribs usually winged; vittae 1(–2) in each furrow, 2(–6) or absent on commissure, narrow, reaching to base of mericarp or clavate and much shorter than mericarp. Seed face plane, rarely slightly concave. Carpophore parted to base, usually persistent.

About 70 species: mainly in Asia and Europe, one species in North America, a few species in E Africa; 29 species (21 endemic) in China.

This is a widespread, taxonomically complex genus with the Hengduan Mountains forming one of two centers of diversity. Generic delimitation is problematic, both within *Heracleum* (recent molecular studies have shown it not to be monophyletic) and with several other genera with dorsally compressed fruit (e.g., *Angelica*, *Peucedanum*, and *Semenovia*). The distinctly clavate vittae, shorter than the length of the mericarp, are characteristic of many *Heracleum* species, but this does not hold for some of the Chinese species. Problems are compounded by the general paucity of good herbarium specimens and the inadequacy of historic type material. Many species are robust and tall plants, in which the primary inflorescences and basal leaves are large and therefore difficult to accommodate in a specimen press. Unfortunately, collectors have tended to select the smaller, lateral branches and upper leaves, which are less informative. Good fruiting material is also often lacking, and some taxa are recorded only from a very few collections. Revised classifications have been proposed for parts of the range of the genus, but as present knowledge is incomplete for Chinese taxa a traditional treatment is followed here.

Many species have reputed medicinal uses, and some are important elements in traditional Chinese medicine.

- 1a. Commissural vittae obscure, apparently absent.
 - 2a. Calyx teeth obsolete 1. *H. xiaojinense*
 - 2b. Calyx teeth present.
 - 3a. Rays 14–17; leaves ternate 2. *H. fargesii*
 - 3b. Rays 6–13; leaves pinnate, pinnae 3–4 pairs 3. *H. subtomentellum*
- 1b. Commissural vittae evident, 2–6.
 - 4a. Dorsal and intermediate ribs closely spaced; lateral wings broader than body of mericarp; vittae filiform.
 - 5a. Lower leaves 2-pinnate; rays 35–45; vittae solitary in each furrow, 2 on commissure 6. *H. nyalamense*
 - 5b. Lower leaves 2–3-pinnate; rays 6–25; vittae 1–2 in each furrow, 2–6 on commissure.
 - 6a. Vittae 1–2 in dorsal furrows, extending to 1/2 length of mericarp 4. *H. kingdonii*
 - 6b. Vittae solitary in dorsal furrows, extending almost to base of mericarp 5. *H. bivittatum*
 - 4b. Dorsal and intermediate ribs widely spaced; lateral wings narrower than body of mericarp; vittae filiform or clavate.
 - 7a. Vittae filiform, extending at least 3/4 the length of mericarp.
 - 8a. Plants slender, to 60 cm high; rays 6–10; fruit ca. 4 × 4 mm 9. *H. yunnanense*
 - 8b. Plants stout, 80–200 cm high; rays 10–40(or more); fruit 8–17 × 7–12 mm.
 - 9a. Petals yellowish, outer petals slightly radiant, hardly enlarged; vittae solitary in each furrow, 2 on commissure (Xinjiang) 7. *H. olgae*
 - 9b. Petals white or pinkish, outer petals conspicuously radiant, greatly enlarged; vittae 1–2 in each furrow, 2–4 on commissure (Yunnan) 8. *H. nepalense*
 - 7b. Vittae clavate, extending to 1/2(–3/4) length of mericarp.
 - 10a. Basal leaves ternate or 1–3-ternate/pinnate.
 - 11a. Calyx teeth obsolete.
 - 12a. Basal leaves ternate; fruit glabrous 10. *H. tiliifolium*
 - 12b. Basal leaves ternate-pinnate; fruit sparsely hispidulous 11. *H. moellendorffii*
 - 11b. Calyx teeth conspicuous.
 - 13a. Terminal leaflets cordate at base; fruit suborbicular; vittae 1–2 in each furrow 12. *H. wenchuanense*
 - 13b. Terminal leaflets truncate at base; fruit obovate; vittae solitary in each furrow 13. *H. vicinum*
 - 14a. Calyx teeth prominent, lanceolate; ultimate segments of leaves ovate-lanceolate or obovate-lanceolate 22. *H. henryi*

- 14b. Calyx teeth minute or obsolete; ultimate segments of leaves ovate, broadly ovate, or ovate-rhombic.
 15a. Calyx teeth minute; fruit obovoid; vittae extending to 3/4 the mericarp 23. *H. rapula*
 15b. Calyx teeth obsolete; fruit suborbicular; vittae extending to 1/2 the mericarp 24. *H. wolongense*
- 10b. Basal leaves 1–4-pinnate.
 16a. Basal leaves 1-pinnate.
 17a. Leaf blade densely grayish or silvery-white hairy, tomentose 28. *H. candicans*
 17b. Leaf blade glabrous, sparsely pubescent or hispid.
 18a. Robust, thick-stemmed plants, umbels 20–30-rayed 18. *H. dissectum*
 18b. Slender, thin-stemmed plants, umbels 10–25-rayed.
 19a. Leaflets shallowly lobed, lobes broadly ovate 15. *H. hemsleyanum*
 19b. Leaflets deeply lobed to pinnatifid, lobes narrowly ovate to lanceolate.
 20a. Adaxial surface of leaf segments apparently bullate 16. *H. scabridum*
 20b. Adaxial surface of leaf segments not bullate.
 21a. Rays 10–25; bracteoles linear, acuminate at apex, distinctly shorter than pedicels 14. *H. forrestii*
 21b. Rays 20–25; bracteoles lanceolate, caudate at apex, equal to or slightly longer than pedicels
 17. *H. oreocharis*
- 16b. Basal leaves 2–4-pinnate.
 22a. Basal leaves 3–4-pinnate, ultimate segments less than 10 mm, linear 29. *H. millefolium*
 22b. Basal leaves 2–3-pinnate, ultimate segments more than 10 mm, ovate or lanceolate.
 23a. Basal leaves 2-pinnate; bracts absent.
 24a. Leaflets lacerate-pinnatifid, segments lanceolate, terminal leaflets without decurrent wings
 at base; calyx teeth minute; fruit suborbicular, 4–6 mm 19. *H. dissectifolium*
 24b. Leaflets serrate, segments ovate, terminal leaflets with decurrent wings at base; calyx teeth
 triangular; fruit ovate or obovate, 6–9 mm.
 25a. Rays 12–22; fruit ovoid, 8–9 mm; vittae 2–4 on commissure 20. *H. franchetii*
 25b. Rays 30–35; fruit obovoid, 6–7 mm; vittae 2 on commissure 21. *H. souliei*
- 23b. Basal leaves 2–3-pinnate; bracts 1–3.
 26a. Ultimate segments of leaf ovate, terminal leaflets cuneate or cordate at base 25. *H. stenopteroides*
 26b. Ultimate segments of leaf lanceolate; terminal leaflets decurrent along rachis at base.
 27a. Calyx teeth lanceolate; fruit obovoid, sparsely pilose 26. *H. stenopterum*
 27b. Calyx teeth triangular; fruit ovoid, almost glabrous 27. *H. yungningense*

1. *Heracleum xiaojinense* F. T. Pu & X. J. He, Acta Phytotax. Sin. 31: 372. 1993.

小金独活 xiao jin du huo

Plants stout, ca. 1 m high. Root cylindrical, aromatic. Stem purplish, pubescent. Basal leaves petiolate; leaf blade 3-pinnate, ultimate segments lanceolate, 5–6 × 1–1.5 cm, margins serrate. Cauline leaves similar to the basal, reduced upward, sessile; petiole with dilated sheath. Terminal umbel 20–30 cm wide, lateral umbels smaller; bracts absent; rays more than 30, unequal, 8–13 cm; bracteoles numerous, linear, 8–15 mm, nearly as long as fruiting pedicels. Calyx teeth obsolete. Petals white, outer flowers in umbel somewhat radiant. Fruit suborbicular, 5–6 × ca. 6 mm; dorsal and intermediate ribs raised, lateral ribs thin winged, wings ca. 0.8 mm wide; vittae solitary in each furrow, clavate, about 3/4 as long as mericarp, commissure without vittae. Seed face slightly concave. Fl. and fr. Jul–Sep.

• Forest margins, alpine scrub and meadows; 3500–4000 m. W Sichuan.

Recent research indicates that this species is conspecific with *Angelica apaensis*.

2. *Heracleum fargesii* H. de Boissieu, Bull. Herb. Boissier, sér. 2, 3: 853. 1903.

城口独活 cheng kou du huo

Plants ca. 80 cm high. Root cylindrical. Stem densely his-

pid. Basal leaves petiolate, sparsely pubescent; leaf blade ternate, lateral leaflets ovate, 3–5-lobed, terminal leaflets broadly ovate, 12–17 × 10–14 cm, both surfaces sparsely pubescent, especially on abaxial veins. Cauline leaves similar to the basal, gradually reduced upward. Peduncles 10–20 cm; bracts absent; rays 14–17, unequal, hispid; bracteoles 5–7, linear, reflexed. Calyx teeth lanceolate. Petals white, outer flowers in umbel somewhat radiant. Fruit broadly ovoid, 6–8 × 5–7 mm, glabrous; dorsal and intermediate ribs filiform, lateral ribs winged, wing ca. 0.8 mm wide; vittae solitary in each furrow, clavate, slightly exceeding 1/2 length of mericarp, commissure without vittae. Seed face plane. Fl. and fr. Aug–Oct.

• Montane forests; 1500–2000 m. NE Sichuan.

This species has reputed medicinal value.

3. *Heracleum subtomentellum* C. Y. Wu & M. L. Sheh, Acta Bot. Yunnan. 13: 274. 1991.

微绒毛独活 wei rong mao du huo

Plants 45–80 cm high, tomentulose throughout. Taproot woody; caudex 1.5–3 cm wide. Basal leaves numerous in rosette; petioles 5–11 cm; leaf blade ovate-oblong in outline, 5–9 × 3–5 cm, pinnate, pinnae 3–4 pairs; proximal pinnae short petiolulate, ovate or ovate-oblong, entire or 3-lobed, 1.3–3.5 × 1.2–2.5 cm, abaxially slightly glaucous, veins prominent, base truncate or subcuneate, margins irregularly serrulate, apex obtuse or

rotund; terminal leaflet rhombic or suborbicular, 3-lobate or 3-parted; other pinnae subsessile, entire. Peduncles stout, 5–15 cm; bracts 3–4, linear, caducous; rays 6–13, unequal, 1.5–4 cm; bracteoles 2–4, linear or ovate-lanceolate, membranous, unequal, 1–3 × 0.5–1.2 mm. Calyx teeth conspicuous, lanceolate-triangular. Petals white, outer flowers in umbel somewhat radiant. Fruit suborbicular, 6–8 × 5–6 mm; dorsal and intermediate ribs filiform, lateral ribs winged, wings to 1 mm; vittae solitary in each furrow, large, clavate, commissure without vittae. Seed face plane. Fl. Aug, fr. Sep.

- Alpine scrub and meadows; ca. 4400 m. NW Xizang (Ngari).

This species is recorded only from the type.

4. *Heracleum kingdonii* H. Wolff, Repert. Spec. Nov. Regni Veg. 33: 76. 1933 [*“kingdoni”*].

贡山独活 gong shan du huo

Plants stout, 50–90 cm high. Stem pubescent. Petioles of lower leaves ca. 20 cm; leaf blade ovate-oblong, 20–30 × 10–15 cm, 1–2-pinnate; pinnae ovate or ovate-oblong, 2–3-lobed or 3-partite, 6–11 × 3–7 cm, margin crenate or serrate, apex acuminate. Upper leaves reduced, 3-lobed. Peduncles 14–22 cm, pubescent; bract 5(–8), lanceolate, ca. 10 × 1 mm; rays 6–22, unequal, 2–5 cm; bracteoles 5(–10), lanceolate. Calyx teeth triangular. Petals white, outer flowers in umbel somewhat radiant. Fruit suborbicular or obovoid, 5–7 × 4–7 mm; dorsal and intermediate ribs filiform closely spaced, lateral ribs broadly winged, wings ca. 2 mm wide, wider than width of mericarp body; vittae filiform, more than half the mericarp body, 1–2 in each dorsal furrow, 1–3 in lateral furrows, 2 on commissure often with 2 additional fragmentary vittae. Fl. Jul–Aug, fr. Sep–Oct.

Montane forests, streamsides; 600–3200 m. ?W Guangxi, ?Guizhou, SE Xizang, NW Yunnan [NE Myanmar].

The Chinese record in FRPS (55(3): 199. 1992) of *Heracleum burmanicum* Kurz (as *“burmanicum”*) is referable to this species.

5. *Heracleum bivittatum* H. de Boissieu, Bull. Herb. Boissier, sér. 2, 3: 855. 1903.

二管独活 er guan du huo

Plants 80–100 cm high. Leaf blade ovate or broad-ovate, 2-pinnate, primary pinnae 3–4 pairs, ultimate segments ovate-oblong, 3–7 × 1.5–3 cm, margins irregularly incised or sharply serrate, apex acuminate. Upper leaves smaller, sessile, pinnate, pinnae lanceolate. Peduncles 10–20 cm; bracts 3–5, lanceolate, 4–5 mm, reflexed; rays 15–20, extremely unequal, 2–6 cm, pubescent; bracteoles lanceolate or linear. Calyx teeth triangular. Petals white, outer flowers in umbel somewhat radiant. Fruit obovoid, 5–6 × ca. 5 mm; dorsal and intermediate ribs filiform, closely spaced; lateral ribs broadly winged, wings ca. 1.5 mm wide, wider than width of mericarp body; vittae filiform, extending almost the length of the mericarp body, solitary in each dorsal furrow, 2 in each lateral furrow, 2–6 on commissure. Seed face plane. Fl. Jul–Sep, fr. Sep–Oct.

Montane forest margins; ca. 3000 m. Guangxi, Guizhou, SW Sichuan, S and W Yunnan [Laos, Vietnam].

This species has reputed medicinal value.

6. *Heracleum nyalamense* R. H. Shan & T. S. Wang, Acta Phytotax. Sin. 18: 378. 1980.

聂拉木独活 nie la mu du huo

Plants stout, to 1 m high. Lower leaves broadly ovate, to 28 × 11 cm, 2-pinnate; ultimate segments ovate to broadly ovate, 4–5 × 2–3 cm, abaxially puberulent on major veins, margins serrate. Upper leaves reduced, smaller, sessile. Peduncles stout, 7–12 cm; bracts 5, linear, 1–1.5 cm; rays 35–45, unequal, 7–9 cm, puberulent; bracteoles 5, linear, 2–4 mm. Calyx teeth conspicuous, narrowly triangular. Petals white, outer flowers in umbel radiant. Fruit obovoid, 7–9.5 × 7–10 mm, glabrous; dorsal and intermediate ribs filiform, closely spaced, lateral ribs broadly winged, wings 2.5–3.5 mm, wider than width of mericarp body; vittae filiform, extending to 1/2 or 2/3 of mericarp, solitary in each furrow, 2 on commissure. Seed face plane. Fl. and fr. Jul–Sep.

- Montane forests; ca. 2300 m. S Xizang (Nyalam).

7. *Heracleum olgae* Regel & Schmalhausen, Izv. Imp. Obšč. Ljubit. Estestv. Moskovsk. Univ. 34(2): 38. 1882.

大叶独活 da ye du huo

Platytaenia olgae (Regel & Schmalhausen) Korovin; *Tetraetaenia olgae* (Regel & Schmalhausen) Mandenova.

Plants stout, 80–200 cm high. Caudex thickened, woody, covered with residual fibers of sheaths. Stem solitary, ± densely hispid, branching from middle. Lower leaves trifoliolate; leaflets ovate or broadly ovate, adaxially finely scabrous-hairy, abaxially sparsely or densely hairy to white tomentose, margin serrate. Upper leaves reduced, small, scarcely divided, blade sessile on expanded sheaths. Umbels numerous, 6–11 cm wide; bracts absent; rays 10–40(or more), unequal, 2–5 cm, densely hispid; bracteoles 5–7, linear, nearly as long as umbellule; umbellules 20–25-flowered. Calyx teeth triangular. Petals yellowish, abaxially hairy, outer flowers in umbel slightly radiant. Fruit obovoid or suborbicular, 8–12 × 7–9 mm, scarious hairy only along ribs; dorsal and intermediate ribs ridged, lateral ribs broadly winged, wings narrower than body of mericarp; vittae solitary in each furrow, filiform, extending 3/4 length of mericarp, 2 on commissure, ca. 1/4 the length of mericarp. Fl. and fr. Jul–Sep.

Stony talus slopes; ca. 2000 m. Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Uzbekistan].

8. *Heracleum nepalense* D. Don, Prodr. Fl. Nepal. 185. 1825.

尼泊尔独活 ni po er du huo

Heracleum nepalense var. *bivittatum* C. B. Clarke; *Tetraetaenia nepalense* (D. Don) Mandenova.

Plants stout, to 2 m high. Root cylindrical, ca. 15 cm long. Stem solitary, pubescent. Basal leaves long-petiolate; leaf blade broad-ovate, 20–45 × 20–35 cm, trifoliolate or 1–2-pinnate, pinnae 3–7 pairs; leaflets broadly ovate, 9–20 × 5–12 cm, both sur-

faces finely pubescent, especially along veins, margins serrate. Cauline leaves similar to the basal, reduced upward, smaller, 3-lobed sessile on expanded sheaths. Umbels (11–)15–30 cm wide; bracts 1–5, linear or absent; rays numerous, (8–)15–60 (or more), 6–9 cm, unequal, extending in fruit; bracteoles 5–8, linear, unequal, 5–9 mm, persistent; umbellule 8–30-flowered. Calyx teeth subulate. Petals white, occasionally pinkish, outer flowers in umbel conspicuously radiant; radiant petals 2-lobed, to 3 × 2.3 mm. Young ovary densely hairy. Fruit obovoid, 9–11 (–17) × 7–10 (–14) mm; dorsal ribs filiform, lateral ribs broadly winged, wings 2.2–4 mm wide; vittae filiform, solitary in dorsal furrows, extending to 2/3 length of mericarp, 1–2 in lateral furrows, shorter than dorsal, 2–4 on commissure, about 2/3 as long as mericarp. Seed face plane. Fl. and fr. Jun–Sep.

Forests, scrub, grassy slopes, roadsides; 2000–4000 m. N and W Yunnan [Bhutan, NE India, Myanmar, Nepal, Sikkim].

9. *Heracleum yunnanense* Franchet, Bull. Soc. Philom. Paris, sér. 8, 6: 143. 1894.

云南独活 yun nan du huo

Plants slender, ca. 60 cm high. Root cylindrical; caudex covered with a few residual fibers of sheaths. Stem solitary, little-branched, sparsely setulose. Lower leaves pinnate; pinnae ovate, base cordate or obtuse, margins serrulate. Distal leaves 3-lobed, smaller, sessile. Bracts 1–3, linear; rays 6–10, unequal, 2–4 cm; bracteoles 4–5, linear, shorter than pedicels; umbellule 10–15 (–20)-flowered. Calyx teeth lanceolate. Petals white, outer flowers in umbel conspicuously radiant. Fruit suborbicular, small, ca. 4 × 4 mm; dorsal ribs filiform, lateral ribs broadly winged; vittae filiform, solitary in dorsal furrows, 2 in lateral furrows, extending to 3/4 length of mericarp, 4 on commissure, slightly shorter than dorsal. Seed face plane. Fl. Jun–Jul, fr. Aug–Sep.

- Grassy slopes; 3600–4100 m. N Yunnan.

This incompletely known species is recorded only from a few collections.

10. *Heracleum tiliifolium* H. Wolff, Repert. Spec. Nov. Regni Veg. 33: 80. 1933.

椴叶独活 duan ye du huo

Plants stout, 1–2 m high. Root cylindrical. Basal leaves long-petiolate; leaf blade ternate, trifoliolate; leaflets round-ovate, undivided or 3-lobed, 6–9 × 5–14 cm, both surfaces sparsely hispidulous, base cordate, margin crenate-serrate or serrate, apex mucronate or acuminate. Cauline leaves similar to the basal, reduced upward, 3-lobed, sessile, sheaths broad-ovate. Terminal umbels ca. 15 cm wide; bracts absent; rays 10–15 (–22), unequal, 4–8 cm, villous; bracteoles 5, lanceolate, shorter than pedicels; umbellules 25–30-flowered. Calyx teeth obsolete. Petals white, outer flowers of umbels radiant, enlarged petals deeply 2-lobed. Young ovary puberulous. Fruit obovoid, 6–10 × 4–6 mm, glabrous; dorsal ribs filiform, lateral ribs broadly winged, wing less than width of mericarp body; vittae solitary in each furrow, clavate, extending to 3/4 length of mericarp, 2 on commissure, about half as long as mericarp. Seed face plane. Fl. Jun–Aug, fr. Aug–Sep.

- Forest margins, thickets on streamsides; ca. 1000 m. Hunan, N Jiangxi (Lu Shan).

This species has reputed medicinal value.

11. *Heracleum moellendorffii* Hance, J. Bot. 16: 12. 1878.

短毛独活 duan mao du huo

Plants stout, 1–2 m tall, hispidulous throughout. Root cylindrical. Stem solitary, branched. Basal and lower petioles 10–30 cm; leaf blade ternate or ternate-pinnate; leaflets 3–5, broadly ovate, 10–20 × 7–18 cm, 3–5-lobed, margin sharply serrate. Upper leaves sessile on expanded sheaths. Peduncles 4–15 cm; bracts few, linear-lanceolate, or caducous; rays 12–30, unequal; bracteoles 5–10, lanceolate; flowers more than 20 per umbellule. Calyx teeth obsolete. Petals white, on outer flowers of umbels radiant, enlarged, ca. 7 mm. Fruit obovoid, 6–8 × 5–7 mm, sparsely hispidulous or almost glabrous; dorsal ribs filiform, lateral ribs broadly winged, wings less than width of mericarp body; vittae solitary in each furrow, 2 on commissure, clavate, extending to 1/2 length of mericarp. Seed face plane. Fl. Jul–Aug, fr. Aug–Sep.

Open forests, forest margins, shaded valleys, alpine meadows, streamsides; below 3200 m. Anhui, Gansu, Hebei, Heilongjiang, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Sichuan, Yunnan, Zhejiang [Japan, Korea].

- 1a. Basal leaves almost 2-pinnate, ultimate segments ovate-lanceolate 11c. var. *subbipinnatum*
- 1b. Basal leaves ternate or ternate-pinnate, ultimate segments broad-ovate.
 - 2a. Fruit obovoid, dorsal and lateral vittae 4 per mericarp in total 11a. var. *moellendorffii*
 - 2b. Fruit suborbicular, dorsal and lateral vittae 2 per mericarp in total 11b. var. *paucivittatum*

11a. *Heracleum moellendorffii* var. *moellendorffii*

短毛独活(原变种) duan mao du huo (yuan bian zhong)

Heracleum barbatum Ledebour subsp. *moellendorffii* (Hance) M. Hiroe; *H. dissectum* Ledebour subsp. *moellendorffii* (Hance) Voroschilov; *H. lanatum* Michaux subsp. *moellendorffii* (Hance) H. Hara; *H. microcarpum* Franchet; *H. morifolium* H. Wolff.

Basal and lower leaves ternate or ternate-pinnate, leaflets 3–5. Fruit obovoid; vittae solitary in furrows, 2 on commissure.

Open forests, forest margins, shaded valleys, streamsides; below 3200 m. Anhui, Gansu, Hebei, Heilongjiang, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Sichuan, Yunnan, Zhejiang [Japan, Korea].

This variety has reputed medicinal value.

11b. *Heracleum moellendorffii* var. *paucivittatum* R. H. Shan & T. S. Wang, Acta Phytotax. Sin. 24: 316. 1986.

少管短毛独活 shao guan duan mao du huo

Basal and lower leaves ternate or ternate-pinnate, leaflets 3–5. Fruit suborbicular; dorsal and lateral vittae 2 per mericarp in total (solitary or absent in the furrows), 2 on commissure.

- Streamsides; below 100 m. NE Shandong (Penglai).

This variety is recorded only from the type.

11c. *Heracleum moellendorffii* var. *subbipinnatum* (Franchet) Kitagawa, Rep. Inst. Sci. Res. Manchoukuo 5: 157. 1941.

狭叶短毛独活 xia ye duan mao du huo

Heracleum microcarpum var. *subbipinnatum* Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 6: 18. 1883; *H. moellendorffii* f. *angustum* (Kitagawa) Kitagawa; *H. moellendorffii* f. *subbipinnatum* (Franchet) Kitagawa; *H. morifolium* f. *angustum* Kitagawa.

Basal and lower leaves almost 2-pinnate, primary pinnae 3–4 pairs, ultimate segments ovate-lanceolate.

Open forests, forest margins, alpine meadows; 1000–3000 m. Hebei, Heilongjiang, Jilin, Nei Mongol [Korea].

12. *Heracleum wenchuanense* F. T. Pu & X. J. He, Acta Phytotax. Sin. 31: 368. 1993.

汶川独活 wen chuan du huo

Plants 1–1.5 m high. Root fibrous. Stem solitary, branched, pubescent. Basal petioles 40–50 cm; leaf blade triangular ovate in outline, 20–28 × 20–25 cm, ternate; lateral leaflets broadly ovate, 12–15 × 12–13 cm, terminal leaflet flabelliform, 16–18 × 19–29 cm, both surfaces sparsely pubescent, base cordate, margin serrulate. Cauline leaves similar to the basal, reduced upward, smaller, 3-lobed. Umbels 9–14 cm wide; bracts 1–3, linear, 1.5–2 cm; rays 17–20, unequal, 4–8 cm, pubescent; bracteoles 5–8, linear, longer than pedicels; umbellule 20–30-flowered. Calyx teeth subulate. Petals white, outer flowers in umbels radiant. Fruit suborbicular, 8–9 × 7–8 mm; vittae 2 in dorsal furrows, 1 in lateral furrows, 2 on commissure, clavate, about 1/2 length of mericarp. Seed face plane. Fl. Jul–Aug, fr. Aug–Sep.

- Forest margins; ca. 3500 m. NC Sichuan (Wenchuan).

This species is recorded only from the type.

13. *Heracleum vicinum* H. de Boissieu, Bull. Herb. Boissier, sér. 2, 3: 853. 1903.

平截独活 ping jie du huo

Plants to 1 m high. Root cylindrical. Stem solitary, branched, sparsely hispid or almost glabrous. Basal leaves ternate, both surfaces hispidulous; lateral leaflets ovate, 3–5 × ca. 3 cm, base cuneate; terminal leaflets broadly ovate, ca. 6 × 5 cm, 3–5-lobed, base truncate. Cauline leaves similar to the basal, lower leaves usually larger than basal, gradually reduced upward. Terminal umbels to 13 cm wide, lateral umbels smaller; peduncles 15–20 cm, densely hispid; bracts absent; rays 15–20, unequal, 5–9 cm, hispid; bracteoles 4–5, linear; flowers more than 20 per umbellule. Calyx teeth triangular, conspicuous. Petals white, outer flowers in umbels radiant. Fruit obovoid, 8–9 × 5–6 mm, sparsely hispidulous or almost glabrous; vittae solitary in each furrow, clavate, about half the length of mericarp, 2 on commissure, less than half or extending to half the length of mericarp. Seed face plane. Fl. Jul–Aug, fr. Aug–Sep. $2n = 22^*$.

- Montane forests and thickets; 2600–3100 m. NE and W Sichuan.

This species has reputed medicinal value.

14. *Heracleum forrestii* H. Wolff, Repert. Spec. Nov. Regni Veg. 33: 75. 1933.

中甸独活 zhong dian du huo

Plants 0.8–1 m tall. Root cylindrical. Stem solitary, slender ca. 8 mm thick at base, branches few, sparsely puberulent. Basal leaves, pinnate, long-petiolate; petiole to 25 cm, narrowly sheathing at base; pinnae 2–3 pairs, ovate or broad-ovate in outline, 3–10 × 3–9 cm, deeply lacerate almost to base into 3 or 5 narrowly ovate lobes, both surfaces puberulent along veins, margins serrate. Cauline leaves gradually reduced, ternate/pinnate; leaflets broad-ovate, 8–9 × 3–8 cm, pinnatifid. Umbels ca. 13 cm wide; bracts 1, or absent; rays 10–25, 2–5(–9) cm, scabrous; bracteoles 2–5, linear, 2–4 mm; umbellules 15–25-flowered. Calyx teeth obsolete or minute. Petals white, outer flowers in umbels radiant; ovary scabrous. Fruit obovoid, 7–10 × 6–7 mm, lateral ribs winged, wings narrower than fruit body; vittae solitary in each furrow, 2 on commissure, clavate, ca. 3/4 length of mericarp. Seed face slightly concave. Fl. Jul–Aug, fr. Aug–Sep.

- Forest margins, dwarf scrub margins, grassy slopes, streamsides; 2700–3900 m. Chongqing (Chengkou), NW Yunnan (Zhongdian).

This incompletely known species is recorded only from a few collections. Species delimitation between this and the following three species from SW China is problematic and in need of taxonomic revision.

15. *Heracleum hemsleyanum* Diels, Bot. Jahrb. Syst. 29: 503. 1900.

独活 du huo

Plants 1–1.5 m tall. Root fusiform. Stem solitary, slender ca. 7 mm thick at base, branched above. Basal leaves long-petiolate; petiole to 25 cm, narrowly sheathing at base; leaf blade pinnate, 3–5-foliolate; pinnae ovate or broad-ovate in outline, 8–13 × 4–10 cm, shallowly or deeply (to 3/4) lobed into 2 or 3 broad-ovate lobes, sparsely pubescent on both surfaces especially on the veins, margins serrate. Cauline leaves gradually reduced upward, sessile, 3-lobed on expanded sheaths. Peduncles 20–30 cm, sparsely puberulent; bracts 1–2, linear-lanceolate; rays 10–25, unequal, 2–7 cm, sparsely pubescent; bracteoles 5–8, linear lanceolate, shorter than pedicels; umbellules 20–25-flowered. Calyx teeth obsolete. Petals white, outer flowers in umbels radiant, enlarged petals broadly obovate, deeply lobed. Ovary scabrous. Fruit suborbicular, 6–7 × 5–6 mm; vittae solitary in each furrow, 2 on commissure, clavate, slightly exceeding 1/2 length of mericarp. Seed face plane. Fl. May–Jun, fr. Aug–Sep. $2n = 22^*$.

- Shady forests, moist thickets; 2000–3000 m. Hubei, SE and W Sichuan.

This species has reputed medicinal value.

16. *Heracleum scabridum* Franchet, Bull. Soc. Philom. Paris, sér. 8, 6: 145. 1894.

糙独活 cao du huo

Plants 40–100 cm tall, hispid throughout. Root fusiform, aromatic. Stem solitary, ca. 8 mm thick at base, branched above. Basal leaves ovate-oblong, nearly as long as petioles, 10–20 × 5–22 cm, pinnate; pinnae ovate or broad-ovate in outline, 1.5–5

× 1–3 cm, deeply divided into 2 or 3 ovate or lanceolate lobes, hispid on both surfaces, adaxially apparently with bullate creases, margins serrate. Cauline leaves gradually reduced upward. Peduncles to 16 cm, densely hispid near apex; bracts 1–3, linear, or absent; rays 10–20, unequal, 2–5 cm, densely hispid; bracteoles 5–7, linear, shorter than pedicels; flowers more than 30 per umbellule. Calyx teeth minute, triangular. Petals white, outer flowers in umbels radiant, enlarged petals broadly obcordate, deeply lobed. Fruit ovoid-elliptic, 6–8 × 5–7 mm, glabrous; vittae solitary in each furrow, 2 on commissure, clavate, extending to 2/3 length of mericarp. Seed face plane. Fl. May–Jul, fr. Aug–Sep.

• Forests, grassy slopes; 2000–2700 m. SW Sichuan, NW Yunnan.

This species has reputed medicinal value.

17. *Heracleum oreocharis* H. Wolff, Repert. Spec. Nov. Regni Veg. 33: 77. 1933.

山地独活 shan di du huo

Plants 60–80 cm tall. Root cylindrical. Stem solitary, little-branched. Basal leaves pinnate; pinnae 2–3 pairs, ovate, 9–12 × 7–9 cm, 2–3-lobed to pinnatifid, sparsely pubescent on both surfaces, margins serrate; terminal leaflets rhombic, 10–13 × 8–12 cm, 3-lobed, base decursive winged. Cauline leaves gradually reduced upward. Umbels ca. 13 cm wide; bracts 8–10, lanceolate, caudate at apex, sparsely pubescent, or caducous; rays 20–25, unequal, 2–6 cm; bracteoles 5–7, similar to the bracts, or linear, unequal, narrow membranous at the margins, equal to or slightly longer than pedicels (characteristic of this species). Calyx teeth minute. Petals white, outer flowers in umbels radiant, enlarged petals broadly obcordate, deeply lobed. Ovary sparsely hirsute. Fruit suborbicular, ca. 7 × 7 mm, dorsal ribs filiform, lateral ribs broadly winged; vittae solitary in each furrow, 2 on commissure, about 2/3 length of mericarp. Seed face plane. Fl. and fr. Jul–Oct.

• Montane forest margins; 2800–4200 m. NW Yunnan.

This incompletely known species is recorded only from a few collections.

18. *Heracleum dissectum* Ledebour, Fl. Altaic. 1: 301. 1829.

兴安独活 xing an du huo

Plants 50–150 cm tall, robust. Root fusiform. Stem solitary, branched with spreading hairs. Basal and lower leaves pinnate, ca. 40 × 30 cm; pinnae 2–3 pairs, broad-ovate, ovate-oblong, pinnatifid, adaxially appressed puberulent, abaxially densely grayish puberulent, base subcordate, oblique, margins serrate. Upper leaves reduced, sessile, sheaths broad-ovate, leaf blade 3-lobed. Peduncles 10–17 cm, terminal umbels ca. 20 cm wide; bracts absent; rays 20–30, unequal, 6–11 cm, glabrous or sparsely pubescent inside; bracteoles 4–7, linear, nearly as long as pedicels, to 13 mm. Calyx teeth triangular, minute. Petals white, outer flowers in umbels radiant, enlarged petals broadly obcordate, deeply lobed. Fruit obovoid, 8–10 × 5–7 mm, glabrous or sparsely puberulent; vittae solitary in each furrow, clavate, extending to 2/3 length of mericarp, 2 on commissure, 1/2 length of mericarp. Seed face plane. Fl. Jul–Aug, fr. Aug–

Sep.

Montane forests, forest margins, moist grasslands; below 2200 m. Heilongjiang, Jilin, Xinjiang [Kazakhstan, Korea, Kyrgyzstan, Mongolia, Russia, Uzbekistan].

19. *Heracleum dissectifolium* K. T. Fu, Fl. Tsinling. 1(3): 464. 1981.

多裂独活 duo lie du huo

Plants 60–100 cm tall. Root cylindrical. Stem solitary, branched above. Basal leaves 2-pinnate; pinnae 3–4 pairs, lacinate-pinnatifid, ultimate segments lanceolate, abaxially sparsely puberulent, margins sharply serrate. Cauline leaves gradually reduced upward. Peduncles 7–20 cm; bracts absent; rays 30–50, unequal, 6–12(–20) cm; bracteoles few, linear; umbellules many-flowered. Calyx teeth minute. Petals white, outer flowers in umbels radiant. Fruit suborbicular, 4–6 × 4–5 mm; vittae solitary in each furrow, 2 on commissure, clavate, exceeding 1/2 length of mericarp. Seed face plane. Fl. Jul–Aug, fr. Aug–Sep.

• Montane thickets, grassy slopes; 1900–3200 m. Gansu, Sichuan.

The taxonomy of this and the following two species is in need of revision.

20. *Heracleum franchetii* M. Hiroe, Umbell. World, 1749. 1979.

尖叶独活 jian ye du huo

Heracleum acuminatum Franchet, Bull. Soc. Philom. Paris, sér. 8, 6: 144. 1894, not Schleicher (1821).

Plants 60–100 cm. Root cylindrical, stout. Stem solitary, lower parts glabrous, pilose above. Basal leaves long-petiolate, sheaths purple; blade ovate-triangular, 16–30 × 9–16 cm, (1–)2-pinnate; pinnae 2 pairs, trifid, ultimate segments ovate-oblong, or lanceolate, 2–5 × 1–1.5 cm, abaxially pubescent, terminal leaflets decursive winged at the base, margin serrate, acuminate or acute at the apex. Cauline leaves gradually reduced upward, 3-lobed. Peduncles stout, 10–20 cm; bracts absent; rays 12–22, 3–9 cm, pilose; bracteoles 2–5, linear, shorter than pedicels; umbellules 10–20-flowered. Calyx teeth triangular. Petals white, outer flowers in umbels radiant. Fruit ovoid, 8–9 × 5–6 mm; vittae solitary in each furrow, 2–4 on commissure, clavate, more than 1/2 length of mericarp. Seed face plane. Fl. Jun–Aug, fr. Aug–Sep.

• Coniferous forests, forest margins, scrub, grassland, alpine meadows, streamsides; 2500–4500 m. W Hubei, Qinghai, W Sichuan, NW Yunnan.

This species has reputed medicinal value.

21. *Heracleum souliei* H. de Boissieu, Bull. Herb. Boissier, sér. 2, 3: 852. 1903.

康定独活 kang ding du huo

Plants to 1 m tall. Root stout. Stem branching, villous. Basal leaves 2-pinnate; ultimate segments ovate or lanceolate, terminal leaflets rhombic, base with decursive wings, apex acuminate. Cauline leaves reduced upward. Umbels 13–14 cm wide; peduncles up to 25 cm, villous; bracts absent; rays 30–35, puberulent; bracteoles few, linear; flowers more than 20 per

umbellule. Calyx teeth triangular. Petals white, outer flowers in umbels radiant. Fruit obovoid, 6–7 × 4–5 mm; vittae solitary in each furrow, 2 on commissure, clavate, more than 1/2 length of mericarp. Seed face plane. Fl. Jul–Aug, fr. Aug–Sep.

- Thickets, grassy slopes; 2600–3500 m. W Sichuan.

This incompletely known species is recorded only from a few collections. It has reputed medicinal value.

22. *Heracleum henryi* H. Wolff, Repert. Spec. Nov. Regni Veg. 33: 76. 1933.

思茅独活 si mao du huo

Plants to 80 cm high. Root cylindrical. Stem few-branched, hirsute. Basal leaves ternate-1–2-pinnate, ultimate segments ovate-oblong or ovate-lanceolate, 2–8 × 2–4.5 cm, sparsely hirsute abaxially or at least along the veins, margin serrate-crenate. Cauline leaves gradually reduced, 1–2-pinnate to 3-lobed. Peduncles ca. 30 cm, densely hirsute; bracts 5–6, lanceolate, apex caudate; rays 25–32, subequal, ca. 4 cm, hispidulous; bracteoles 6–10, lanceolate or linear, unequal; umbellule 20–30-flowered. Calyx teeth lanceolate. Petals white, apex mucronate, outer flowers in umbel radiant, enlarged petals deeply 2-lobed. Fruit suborbicular, 5–6 × 4–5 mm, hirtellous; vittae solitary in each furrow, 2 on commissure. Fl. Jul–Aug, fr. Sep. $2n = 44^*$.

- Sparse forests, forest margins, thickets on streamsides, grassy slopes; 1300–2300 m. Yunnan.

This species has reputed medicinal value.

23. *Heracleum rapula* Franchet, Bull. Soc. Philom. Paris, sér. 8, 6: 145. 1894.

鹤庆独活 he qing du huo

Plants 80–120 cm high. Stem solitary, branched, setulose. Lower leaves ternate/pinnate; leaflets broad-ovate, 8–10 × 5–8 cm, adaxially sparsely setulose, abaxially densely setulose on the veins, 3–5-lobed, lobes ovate-triangular. Upper leaves smaller, sessile, 3-lobed on expanded sheaths. Bracts absent; rays 18–25, unequal; bracteoles 4–6, linear; flowers ca. 20 per umbellule. Calyx teeth minute. Petals white, outer flowers of umbels radiant. Fruit obovoid, 6–7 × 5–6 mm, glabrous; vittae solitary in each furrow, 2 on commissure, clavate, extending to 3/4 length of mericarp. Seed face plane. Fl. and fr. Jul–Oct.

- Streamsides, rice field margins; 2000–2200 m. Yunnan.

This incompletely known species is recorded only from a few collections. It has reputed medicinal value.

24. *Heracleum wolongense* F. T. Pu & X. J. He, Acta Phytotax. Sin. 31: 370. 1993.

卧龙独活 wo long du huo

Plants stout, 1–1.5 m tall, pubescent throughout. Root fusiform. Basal petioles 35–50 cm; leaf blade ternate-2-pinnate; primary pinnae 4 pairs, ultimate segments ovate or ovate-rhombic, 5–12 × 3–6 cm, 3–5-lobed, both surfaces densely pubescent on veins, base cuneate or obtuse, margins serrate, apex acute or acuminate. Cauline leaves gradually reduced upward. Umbels 11–20 cm wide; bracts absent; rays 24–35, unequal, 4–10 cm; bracteoles 5, linear, shorter than pedicels; umbellule 30–40-flowered.

ed. Calyx teeth obsolete. Petals white, obovate, outer flowers in umbel conspicuously radiant. Fruit suborbicular, 7–9 × 6–8 mm; vittae solitary in each furrow, slightly exceeding 1/2 length of mericarp, 2 on commissure, shorter than the dorsal. Seed face plane. Fl. Jul–Aug, fr. Aug–Sep. $2n = 22^*$.

- Forest margins, thickets, grassy slopes; 1900–2200 m. NC Sichuan (Wenchuan).

25. *Heracleum stenopteroides* Fedde ex H. Wolff, Repert. Spec. Nov. Regni Veg. 33: 79. 1933.

腾冲独活 teng chong du huo

Plants 80–120 cm tall. Root cylindrical. Stem solitary, rather stout, branched above. Basal leaves 2–3-pinnate; petiole sheaths broad-ovate; primary pinnae 3–4 pairs, ultimate segments ovate, 1.5–3.2 × 1–2 cm, rachises and veins hispidulous, base cuneate or cordate, margins serrate. Cauline leaves gradually reduced upward. Peduncles 4–12 cm; bracts 1–3, lanceolate, or caducous; rays 25–30, unequal, 3–9 cm, densely hispidulous; bracteoles 6–8, lanceolate, nearly as long as or shorter than pedicels. Calyx teeth lanceolate. Petals white, outer flowers in umbel radiant, enlarged petals deeply 2-lobed. Ovary densely hispidulous. Mature fruits unknown. Fl. May–Jul.

- Forests, thickets; 2000–2300 m. W Yunnan (Tengchong).

This incompletely known species is recorded only from a few collections.

26. *Heracleum stenopterum* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 291. 1912.

狭翅独活 xia chi du huo

Plants 40–100 cm tall, hispid. Root cylindrical. Stem solitary, branched above. Basal leaves 2–3-pinnate; petiole, sheaths broad-ovate; blade lacerate-pinnatifid; ultimate segments lanceolate, 3–8 × 1–3 cm, base cuneate, margins coarsely serrate; terminal leaflets decursive at base. Cauline leaves gradually reduced upward. Terminal umbels 10–20 cm wide; bracts 2–3, linear; rays 25–35, unequal, 4–10 cm; bracteoles 5–8, linear, nearly as long as pedicels; umbellule 30–40-flowered. Calyx teeth lanceolate. Petals white, outer flowers in umbel radiant, enlarged petals deeply 2-lobed. Fruit obovoid, 6–7 × 4–5 mm, sparsely pilose; vittae solitary in each furrow, 2 on commissure, clavate, about 1/2 as long as mericarp. Seed face plane. Fl. Jul–Aug, fr. Sep. $2n = 22^*$.

- Coniferous forests, alpine scrub and meadows, alpine talus slopes; 2700–4300 m. W Sichuan, W Yunnan.

This species has reputed medicinal value (in Yunnan).

27. *Heracleum yungningense* Handel-Mazzetti, Symb. Sin. 7: 729. 1933.

永宁独活 yong ning du huo

Plants to 1 m tall. Root cylindrical. Stem sparsely hispid or glabrous. Petioles of lower leaves 15–17 cm, hispid; blade ovate-oblong, 15–20 × 6–8 cm, 2–3-pinnate, primary pinnae 3 pairs; ultimate segments ovate-lanceolate, 5–8 × 3–4 cm, both surfaces hispidulous, margins irregularly serrate. Upper leaves gradually reduced, sessile, pinnate to 3-lobed on expanded sheaths.

Peduncles 16–30(–40), hispid; bracts few, linear, or absent; rays (13–)20–30, unequal, 3–8 cm; bracteoles few, linear; umbellules 20–30(–40)-flowered. Calyx teeth triangular. Petals white, outer flowers in umbel radiant. Fruit ovoid, 5–6 × ca. 5 mm, subglabrous; vittae solitary in each furrow, 2 on commissure, clavate, slightly exceeding 1/2 length of mericarp. Fl. Jul–Aug, fr. Sep–Oct. $2n = 22^*$.

• Coniferous forests, forest margins, thickets on streambanks, grasslands; 2700–4500 m. W Sichuan, NW Yunnan.

This species has reputed medicinal value.

28. *Heracleum candicans* Wallich ex de Candolle, Prodr. 4: 192. 1830.

白亮独活 *bai liang du huo*

Plants 40–100(–200) cm tall, pubescent or tomentose. Root stout, cylindrical. Stem solitary, branched. Basal and lower leaves pinnate; pinnae 2–3 pairs, ovate-oblong, 5–7(–20) × 3–5 cm, pinnatifid, abaxially silvery, densely white tomentose, margins serrate, apex mucronate or obtuse. Upper leaves reduced, sessile, 3-lobed on expanded sheaths. Peduncles 15–30 cm, pubescent; bracts 1–3, linear, caducous; rays 15–25(–35), unequal, 3–7(–10) cm, pubescent; bracteoles 5–8, linear; umbellules 20–25-flowered. Calyx teeth minute. Petals white, outer flowers of umbels radiant. Fruit obovoid, 5–8(–10) × 4–6 mm, glabrous when mature; vittae solitary in each furrow, 2 on commissure, clavate, extending to 2/3 length of mericarp. Seed face plane. Fl. May–Jul, fr. Aug–Sep. $2n = 22^*$.

Sparse forests, coniferous forest margins, scrub, alpine meadows, arid grassy slopes, streambanks; 1800–4500 m. W Sichuan, E and S Xizang, C and N Yunnan [Bhutan, N India, Kashmir, Nepal, Pakistan, Sikkim].

This species is very variable, particularly in the size and dissection of the leaves and the shape of the leaflets.

- 1a. Pinnae ovate-oblong, apex mucronate or obtuse 28a. var. *candicans*
- 1b. Pinnae ovate, broad-ovate or rotund, apex obtuse 28b. var. *obtusifolium*

28a. *Heracleum candicans* var. *candicans*

白亮独活(原变种) *bai liang du huo* (*yuan bian zhong*)

Tetrataenium candicans (Wallich ex de Candolle) Mandenova.

Pinnae ovate-obovate, apex mucronate or obtuse. Vittae 2 on commissure.

Sparse forests, coniferous forest margins, scrub on arid slopes and in abandoned fields, streambanks; 1800–4500 m. W Sichuan, E and S Xizang, C and N Yunnan [N India, Kashmir, Nepal, Pakistan].

This variety has reputed medicinal value.

28b. *Heracleum candicans* var. *obtusifolium* (Wallich ex de Candolle) F. T. Pu & M. F. Watson, Acta Phytotax. Sin. 42: 562. 2004.

钝叶独活 *dun ye du huo*

Heracleum obtusifolium Wallich ex de Candolle, Prodr. 4: 191. 1830; *Tetrataenium obtusifolium* (Wallich ex de Candolle) Mandenova.

Pinnae ovate, broad-ovate or rotund, apex obtuse. Vittae 2(–4) on commissure. $2n = 22^*$.

Scrub, alpine meadows, arid grassy slopes; 3000–4200 m. W Sichuan, S Xizang, C and NW Yunnan [Bhutan, NE India, Nepal, Sikkim].

29. *Heracleum millefolium* Diels, Repert. Spec. Nov. Regni Veg. 2: 65. 1906.

裂叶独活 *lie ye du huo*

Plants 10–50 cm tall, white puberulent. Root fusiform, 30–50 × 5–10 mm; stem collar fibrous with residual sheaths. Stem 2–3-branched, hispid. Leaves mostly basal; petioles 1.5–9 cm; leaf blade narrowly oblong or lanceolate, 2.5–16 × 0.6–2.5 cm, 3–4-pinnate; primary pinnae 4–7 pairs, ultimate segments linear, 2–5 × 0.5–1 mm. Cauline leaves few, similar to the basal, smaller. Inflorescence 1–2-branched, terminal umbels 3–4 cm wide, compact; peduncles 5–25 cm, hispid; bracts 4–5, linear, 2–6 mm, sparsely puberulent; rays 4–12, unequal, 0.5–2.5 cm, scabrid; bracteoles 4–5, linear-lanceolate, 3–5 mm, sometimes 2-lobed at apex, hispidulous. Calyx teeth prominent, triangular, ca. 0.75 mm, unequal. Petals white, yellowish or purplish, outer flowers in umbel radiant, enlarged petals very conspicuous, deeply 2-lobed, abaxially hispidulous. Ovary sparsely puberulent. Fruit broad ovoid, 5–6 × ca. 4 mm, puberulent; lateral ribs narrowly winged; vittae solitary in each furrow, 2 on commissure, clavate, slender, extending to 3/4 length of mericarp. Seed face plane. Fl. Jun–Aug, fr. Sep–Oct. $2n = 22^*$.

Coniferous forests, sparse forests, forest margins, alpine scrub and meadows, riparian grasslands, crop margins; 2800–5000 m. C and SW Gansu, Qinghai, W Sichuan, SE Xizang, NW Yunnan [Bhutan].

This species is retained within the genus *Heracleum* on account of the radiant outer flowers and clavate vittae.

- 1a. Primary pinnae close to each other along the rachis, ultimate segments short, 2–5 mm 29a. var. *millefolium*
- 1b. Primary pinnae remotely inserted on

the rachis, ultimate segments long,
5–8 mm 29b. var. *longilobum*

29a. *Heracleum millefolium* var. *millefolium*

裂叶独活(原变种) lie ye du huo (yuan bian zhong)

Heracleum smithii Fedde ex H. Wolff; *Peucedanum malcolmii* Hemsley & H. Pearson; *Semenovia millefolia* (Diels) V. M. Vinogradova & Kamelin.

Primary pinnae 4–7 pairs, close to each other along the rachis, ultimate segments linear, 2–5 × 0.5–1 mm.

Sparse forests, forest margins, alpine scrub and meadows, riparian grasslands; 2900–5000 m. SW Gansu, Qinghai, W Sichuan, SE Xizang, NW Yunnan [Bhutan].

This variety has reputed medicinal value.

29b. *Heracleum millefolium* var. *longilobum* C. Norman, J. Arnold Arbor. 14: 25. 1933.

长裂叶独活 chang lie ye du huo

Heracleum longilobum (C. Norman) M. L. Sheh & T. S. Wang; *Semenovia montana* Kamelin & V. M. Vinogradova.

Primary pinnae remotely inserted on the rachis, ultimate segments linear, 5–8 × 1–2 mm. $2n = 22^*$, 24^* .

• Coniferous forests, alpine scrub and meadows, crop margins; 2800–3500 m. C and SW Gansu, SE Qinghai, W Sichuan, SE Xizang.

The following taxa have been described or reported from Chinese material, but are imperfectly known by the present authors because no specimens have been seen or the specimens are inadequate.

Heracleum canescens Lindley (in Royle, Ill. Bot. Himal. Mts. 232. 1839), described from NW India (“Mussooree,” *J. F. Royle s.n.*, lectotype, K), has been doubtfully reported from Xizang and NW Yunnan. All Chinese specimens allegedly of this W Himalayan (NW India, Pakistan) species seen by us were inadequate for accurate determination.

Heracleum kansuense Diels (Repert. Spec. Nov. Regni Veg. 2: 66. 1906), described from Ningxia (“Gansu: Hsi ning fu” [Xiningpu]), *W. Filchner 21*, holotype, P).

Heracleum likiangense H. Wolff (Repert. Spec. Nov. Regni Veg. 33: 78. 1933), described from Yunnan (Lijiang, 13500 ft, *J. F. C. Rock 4957*, holotype, unlocalized).

Heracleum moellendorffii var. *sageniifolium* K. T. Fu (Fl. Tsinling. 1(3): 464. 1981 [“*sageniifolium*”]), described from Gansu and Shaanxi (*K. T. Fu 17238*, holotype, WNU).

Heracleum schansianum Fedde ex H. Wolff (Repert. Spec. Nov. Regni Veg. 33: 78. 1933), described from Shanxi (*K. A. H. Smith 7632*, holotype, GB).

