APIACEAE (UMBELLIFERAE)

伞形科 san xing ke

She Menglan (佘孟兰 Sheh Meng-lan)¹, Pu Fading (溥发鼎 Pu Fa-ting)², Pan Zehui (潘澤惠)³; Mark F. Watson⁴, John F. M. Cannon⁴, Ingrid Holmes-Smith⁴, Eugene V. Kljuykov⁵, Loy R. Phillippe⁶, Michael G. Pimenov⁵

Herbs, annual or perennial, rarely woody at base. Caulescent or acaulescent, stem hollow or solid. Leaves alternate, rarely opposite or basal; petiole usually sheathing at base; stipules absent (except in subfam. Hydrocotyloideae); leaf blade compound or sometimes simple, usually much incised or divided, pinnatifid to pinnatisect, or ternate-pinnately decompound. Flowers epigynous, small, bisexual or staminate (unisexual male), regular, in simple or compound umbels; umbellules few to many-flowered; rays often subtended by bracts forming an involucre; umbellules (sometimes called umbellets) usually subtended by bracteoles forming an involucel. Pedicels long, short or obsolete (then forming a capitulate umbellule). Calyx tube wholly adnate to the ovary; calyx teeth (sometimes called sepals) small or obsolete, forming a ring around the top of the ovary. Ovary inferior, 2-celled, with one anatropous ovule in each locule. Styles 2, usually swollen at the base forming a stylopodium which often secretes nectar. Fruit dry, of two mericarps united by their faces (commissure), and usually attached to a central axis (carpophore), from which the mericarps separate at maturity; mericarps are variously flattened dorsally, laterally or terete; each mericarp has 5 primary ribs, one down the back (dorsal rib), two on the edges near the commissure (lateral ribs), and two between the dorsal and lateral ribs (intermediate ribs), occasionally with four secondary ribs alternating with the primary, the ribs filiform to broadly winged, thin or corky; vittae (oil-tubes) usually present in the furrow (intervals between the ribs sometimes called the valleculae) and on the commissure face, rarely also in the pericarp, sometimes obscure. Each mericarp 1-seeded, splitting apart at maturity. Seed face (commissural albumen) plane, concave to sulcate.

Between 250 and 440(–455) genera and 3300–3700 species: widely distributed in the temperate zone of both hemispheres, mainly in Eurasia and especially in C Asia; 100 genera (ten endemic) and 614 species (340 endemic) in China.

Although many members of this family have distinctive vegetative and floral features, providing a useful key to identify the many genera in China presents several difficulties. First, the classification of genera and generic groupings has been largely based on the morphology and anatomy of the fruit. Thus, to construct a “good” dichotomous key with equal leads, rather than “chipping off” individual genera using unique characteristics, the use of fruit macro- and microscopic characters is unavoidable. This is even more acute when dealing with large numbers of genera. Another major problem is that several of the large genera are heterogeneous, with diffuse generic boundaries and broad patterns of variation. To try and cope with these difficulties two types of identification tool are presented here. The first is a dichotomous key that emphasizes the traditional fruit characters, and the second is a multi-access key that allows easy comparison of ten characteristics across all genera. The multi-access key is particularly useful for incomplete material, but it is worth stressing that specimens without at least developing fruit are usually very difficult to identify.

The ten genera endemic to China are Chaerophyllum, Changium, Chuanminshen, Cyclorhiza, Dickinsia, Harrysmithia, Melanosciadium, Nothosmyrnium, Notopterygium, and Sinolimprichtia.

Chinese genera of economic importance include Angelica, Bupleurum, Centella, Changium, Cnidium, Fersula, Glehnia, Heracleum, Hydrocotyle, Ligusticum, Notopterygium, and Peucedanum (medicinal); Anethum, Coriandrum, Caninus, Foeniculum, and Pimpinella (flavoring); and Aiptoma, Daucus, Oenanthe, and Petroselinum (vegetables).


Dichotomous key to genera

The following dichotomous key reflects the traditional classification of the genera of the Apiaceae into subfamilies, tribes, and subtribes. This classification relies heavily on characters of fruit morphology and anatomy, many of which are subject to convergent evolution (e.g., for fruit dispersal strategies). The long-hold understanding that this gives rise to artificial, heterogeneous assemblages has been verified by recent molecular studies of DNA sequences. For this reason tribes and subtribes are not formally recognized in the following account; however, they are indicated in the dichotomous key and the traditional order of genera is largely retained. It is worth noting that the generic grouping within the three subfamilies is well supported by molecular evidence, the exception being Hydrocotyle and Centella which are most likely derived, herbaceous members of the Araliaceae and not Hydrocotyloideae (the residue of this subfamily is restricted to the S hemisphere).

1a. Stem creeping or ascending, rarely erect; leaves simple; leaf blade reniform or rounded-cordate; umbels simple; endocarp woody; vittae obscure or distinct, borne in the ribs, not in the furrow (subfam. Hydrocotyloideae).

2a. Fruit flattened dorsally, carpophore shortly bifid at the apex (tribe Mulineae) ................................. 3. Dickinsia

2b. Fruit flattened laterally, commissure narrow, carpophore absent (tribe Hydrocotyloideae).

References:

1 Institute of Botany, Jiangsu Province and Chinese Academy of Sciences, Nanjing Botanical Garden, Mem. Sun Yat-Sen, Nanjing, P.O. Box 1435, Jiangsu 210014, People’s Republic of China.
2 Chengdu Institute of Biology, Chinese Academy of Sciences, P.O. Box 416, Chengdu, Sichuan 610041, People’s Republic of China.
3 Royal Botanic Garden Edinburgh, 20a Inverleith Row, Edinburgh EH3 5LR, Scotland, United Kingdom.
4 c/o Department of Botany, The Natural History Museum, Cromwell Road, London SW7 5BD, England, United Kingdom.
5 Moscow State University, Moscow 119899, Russia.
6 Illinois Natural History Survey, 607 East Peabody Drive, 172 Natural Resources Building, Champaign, Illinois 61820-6970, U.S.A.
3a. Bracts absent; petals valvate; dorsal fruit ribs prominent, lateral ribs obscure, surface smooth ........................................ 1. Hydrocotyle
3b. Bracts present; petals imbricate; dorsal and lateral fruit ribs prominent, surface wrinkled ........................................... 2. Centella
1b. Stem usually erect, sometimes reduced, not creeping; leaves compound or simple; umbels compound, rarely simple or subcrenose-branched to capitate; endocarp not woody; vittae distinct to obscure, borne in the primary ribs or furrows.
4a. Leaves simple, usually palmately divide to shallowly lobed; umbels simple or compound, occasionally capitulate; fruit covered with scales, tubercles or prickles, rarely glabrous; styles elongate (subfam. Saniculoideae).
5a. Basal leaves orbicular, rounded-cordate or cordate-pentagonal, usually palmately lobed; flowers polygamous, umbels in racemose, cymous or corymbose inflorescences .................................................. 3a. Aegopodium
5b. Basal leaves long-elliptic, lanceolate or oblanceolate, undivided; flowers bisexual, borne in capitulate inflorescences .................................................. 4. Sanicula
4b. Leaves compound, rarely simple; umbels compound, very rarely simple (acaulent plants with sessile terminal umbel appearing simple); rays numerous, well developed; fruit glabrous or pubescent, sometimes fine-prickly or spiny; styles short or long (subfam. Apioideae).
6a. Fruit with both primary and secondary ribs, secondary ribs prominent or winged.
7a. Ribs not spinose (tribe Laserpitaeae) ........................................................................................................ 99. Saposhnikovia
7b. Ribs spinose (tribe Dauceae) .................................................................................................................. 100. Daucus
6b. Fruit with primary ribs, secondary ribs absent (except Aphanopleura and Cuminum).
8a. Commissure face of seed plane, rarely slightly concave.
9a. Fruit ribs equal, mericarp orbicular or subpentagonal cross section, usually slightly laterally compressed (tribe Ammineae).
10a. Primary ribs of fruit filiform, commissure narrow (subtribe Carinae).
11a. Leaves simple, undivided .................................................................................................................. 34. Bupleurum
11b. Leaves divided, ternate, pinnate or pinnately decompound.
12a. Fruit both with primary and secondary ribs; vittae large, 1 in each furrow.
13a. Fruit ovoid, secondary ribs clavate-hispids or papillose .......................................................... 35. Aphanopleura
13b. Fruit oblong-ellipsoid, secondary ribs setulose ........................................................................... 36. Cuminum
12b. Fruit with primary ribs only; vittae 1 to several in each furrow, rarely absent.
14a. Petals attenuate or thickening at base, or apex caudate to linear.
15a. Petals thickening at base, often sac-like .................................................................................... 46. Pternopetalum
15b. Petals caudate or linear at apex .................................................................................................. 49. Acronema
14b. Petals neither thickening at base nor apex caudate.
16a. Fruit oblong-ellipsoid or ellipsoid, base rounded.
17a. Calyx teeth conspicuous, ovate-triangular ............................................................................... 55. Carlesia
17b. Calyx teeth minute or obsolete.
18a. Fruit vittae obscure; styles long, very reflexed ........................................................................ 51. Aegopodium
18b. Fruit vittae conspicuous; styles short or long, less reflexed.
19a. Styles long, reflexed.
20a. Vittae 1 in each furrow, 2 on commissure ............................................................................. 43. Ammi
20b. Vittae 3–4 in each furrow, 6–8 on commissure ................................................................. 47. Chamaesciadium
19b. Styles short, erect or divaricate.
21a. Leaves ternate-parted, leaflets rhombic-ovate, margin doubly serrate .................................. 42. Cryptotaenia
21b. Leaves 2–4-pinnatisect, ultimate segments linear or lanceolate-linear, entire.
22a. Ultimate leaf segments lanceolate-linear, 20–90 × 1–5 mm .................................................. 52. Seselopsis
22b. Ultimate leaf segments narrowly linear, 2–10 × 0.2–1 mm.
23a. Bracts and bracteoles membranous ......................................................................................... 53. Hyalolaena
23b. Bracts and bracteoles usually absent, rarely few, not membranous ................................... 44. Carum
16b. Fruit ovoid-globose, base often cordate.
24a. Calyx teeth conspicuous, ovate-triangular; vittae 1 in each furrow ....................................... 39. Cicuta
24b. Calyx teeth obsolete or minute; vittae 1 to several in each furrow.
25a. Vittae 2 to numerous (rarely 1) in each furrow, 4–6 on commissure.
26a. Vittae small, numerous, forming a continuous ring encircling the seed; fruit wall thick, corky .................................................................................................................. 57. Berula
26b. Vittae large, 2–4 in each furrow, not forming a ring encircling the seed; fruit wall not thick, corky.
27a. Bracts membranous, pale green or absent.
28a. Bracts absent .............................................................................................................................. 40. Trachyspermum
28b. Bract membranous .................................................................................................................. 54. Nothosmyrnium
27b. Bracts lanceolate to linear, green, persistent.
29a. Plants of wet, swampy ground; leaves pinnate to pinnatisect ........................................... 58. *Sium*
29b. Plants of dry ground; leaves undivided, 3-parted, ternate-pinnate or ternate-pinnatifid .............................................................. 48. *Pimpinella*

25b. Vittae usually 1 in each furrow, 2 on commissure.
30a. Petals base clawed, unequal, the outer usually radiant ....................................................... 45. *Sinocarum*
30b. Petals base not clawed, usually equal.

31a. Fruit surface villous, verrucose or papillose.
31b. Fruit surface densely villous ................................................................................................ 41. *Eriocyla*
32a. Fruit surface verrucose or papillose .................................................................................. 50. *Harrysmithia*
32b. Fruit glabrous or almost so.

33a. Branches opposite or verticillate; leaves 2–3-pinnate ..................................................... 38. *Petroselinum*
33b. Branches alternate; leaves pinnate or ternate-pinnate.

34a. Plants biennial or perennial, often aquatic or amphibious, taproots stout or with creeping rootstocks, rooting at nodes ............................................................................. 37. *Apium*
34b. Plants annual, terrestrial, taproots slender, without creeping rootstock, not rooting at nodes ........................................................................................................................................... 56. *Cyclospermum*

10b. Fruit ribs prominent to narrowly winged, commissure moderately broad (subtribe Seselinae).
35a. Semiaquatic or marshland herbs; outer petals of umbellule not conspicuously radiant; lateral fruit ribs corky-thickened, subtriangular ........................................................................................................ 61. *Oenanthe*
35b. Terrestrial herbs; outer petals of umbellule usually conspicuously radiant; lateral fruit ribs not corky (rarely corky-thickened, see *Cortiella, Pterygopleurum*).

36a. Plants strongly aromatic throughout; leaves decompound-pinnatisect, ultimate segments filiform, less than 1 mm wide; petals yellow.
36b. Plants not strongly aromatic; leaves 1–3-pinnate or pinnately decompound, ultimate segments broad or narrow, more than 1 mm wide; petals white, purplish-purple, purple, creamy white or greenish white, not strongly yellow (except yellow in *Silanum*).
37a. Petals oblong, terete; ribs equal; stem gray-green ............................................................ 63. *Foeniculum*
37b. Fruit ovate-ellipsoid, slightly flattened dorsally; lateral ribs more or less broader than the dorsal; stem green ........................................................................................................................................... 64. *Anethum*

38a. Fruit oblong or ellipsoid, slightly to strongly flattened dorsally; mericarps not pentagonal in cross section; ribs unequal, lateral wings much broader than dorsal.
40a. Fruit flat-globose, all ribs broadly winged, lateral ribs broadest, wings cork-spongy ........... 75. *Cortiella*
40b. Fruit ellipsoid or oblong, dorsal ribs filiform, narrowly winged, lateral ribs more broadly winged than the dorsal, not cork-spongy.
41a. Acaulescent or subcaulescent; bracteoles ca. equaling umbellules ........................................... 76. *Cortia*
41b. Caulescent, stem usually above 25 cm; bracteoles 2–3 × umbellules .................................... 77. *Oreocomopsis*

39b. Bracts absent or present, usually entire, rarely divided.
42a. Lateral fruit ribs broadly winged, wings more than 2 × width of dorsal ribs; calyx teeth well developed, often equaling or exceeding the stylopodium ................................................................. 69. *Selinum*
42b. Lateral fruit ribs winged, wings equaling or slightly broader than the dorsal; calyx teeth usually minute or obsolete .............................................................. 72. *Ligusticum*

38b. Fruit ovoid-oblong or ellipsoid, slightly flattened laterally or dorsally, usually terete; mericarp pentagonal in cross section; all ribs equal or subequal.
43a. Fruit ribs irregularly denticulate, denticles stiffly membranous .................................................. 70. *Stenocoelium*
43b. Fruit ribs entire, denticles absent.
44a. Bracts and bracteoles leaf-like, 1–2-pinnate ........................................................................ 62. *Schulzia*
44b. Bracts entire; bracteoles entire, rarely pinnate.
45a. Rays much reduced, umbels capitulate (appearing simple); petals purplish-brown .......... 74. *Haplosphaera*
45b. Rays well developed, umbels not capitulate; petals white, creamy-white or purplish.
46a. Calyx teeth well developed, subulate, lanceolate or triangular-ovate.
47a. Fruit ribs filiform, prominent, obtuse or acute but neither thickened nor corky-dilated at base .................................................................................................................. 59. *Libanotis*
47b. Fruit ribs winged, wings thickened or corky-dilated at base.
48a. Leaves 1–2-pinnate or ternate-pinnate, ultimate segments long-lanceolate, entire; fruit ribs corky-dilated at base ........................................................................ 66. *Pterygopleurum*
48b. Leaves 2–3-pinnate, ultimate segments ovate-lanceolate to linear, usually serrate or lobed; wings thickened but not corky dilated at base ........................................ 73. *Pachypleurum*
46b. Calyx teeth minute or obsolete.
49a. Bracteoles fused at base or up to the middle.
50a. Stylopodium conic or depressed, margin not lobed; fruit ovoid or ellipsoid ....................... 60. Seseli
50b. Stylopodium flat, margin deeply lobed; fruit oblong ....................................................... 67. Lithosciadium
49b. Bracteoles separate, not fused at base.
51a. Fruit ribs narrowly winged, wings hollow ................................................................. 71. Cenolophium
51b. Fruit ribs acute or winged, wings not hollow.
52a. Petals yellow; fruit vittae numerous, small, obscure at maturity ................................. 65. Silaum
52b. Petals white or pinkish; fruit vittae 1 in each furrow, 2 on commissure, conspicuous
53a. Lateral mericarp wings divergent at maturity, lateral wings ca. 2 × broader than dorsal wings (subtribe
Angelicinae).
53b. Lateral mericarp wings adnate or closely appressed at maturity, lateral wings less than 2 × broader
than the dorsal wings.
54a. Fruit compressed-globose or ellipsoid, ribs all winged, thickened or corky-thickened, ribs equal
or lateral ribs slightly broader than dorsal.
55a. Vittae numerous, almost encircling and adhering to the seed ........................................... 79. Archangelica
55b. Vittae 1–3 in each furrow, 2–6 on commissure, not adhering to the seed.
56a. Fruit glabrous ................................................................. 80. Coelopleurum
56b. Fruit densely hirsute and velutinous on the surface .......................................................... 85. Glehnia
54b. Fruit ovoid to oblong, ribs all winged, slender, not corky-thickened, usually lateral ribs broader
than or rarely just equaling dorsal.
57a. Petals yellowish-green to yellow ...................................................................................... 84. Levisticum
57b. Petals white, rarely pinkish, purplish or dark purple.
58a. Outer petals of umbellules radiant, conspicuously enlarged ............................................ 81. Czernaevia
58b. Outer petals of the umbellule not radiant, equal.
59a. Calyx teeth conspicuous, triangular or ovate, persistent .................................................. 83. Ostericum
59b. Calyx teeth minute or obsolete.
60a. Leaf sheaths usually elongate, tube-like; fruit ribs without vascular bundle ................. 78. Contioselinum
60b. Leaf sheaths usually broadly ovate or saciform; fruit ribs all with vascular bundles .......... 82. Angelica
53b. Lateral mericarp wings adnate or closely appressed at maturity, lateral wings less than 2 × broader
than the dorsal wings.
61a. Lateral mericarp wings membranous (subtribe Ferulineae).
62a. Flowers polygamous, bisexual flowers only at the terminal primary-umbel, all the lateral umbels
with male flowers; stylopodium base dilated, lobed or undulated-marginated.
63a. Petals white; bracteoles usually absent ........................................................................... 86. Arcuatopterus
63b. Petals yellow or yellowish-green; bracteoles usually present.
64a. Flowers pedicellate, umbellules loose, not capitate .......................................................... 87. Ferula
64b. Flowers subsessile; umbellules capitate
65a. Fruit densely pubescent, dorsal ribs obscure; vittae 3–5 in each furrow, 10–12 on the
commissure .......................................................................................................................... 88. Schumannia
65b. Fruit glabrous, dorsal ribs filiform, prominent; vittae 1 in each furrow, 2–4 on the
commissure .......................................................................................................................... 89. Soranthus
62b. Flowers often bisexual, male flowers only in the upper lateral umbels; stylopodium base usually
undilated, entire.
66a. Flowers yellow .................................................................................................................. 93. Talassia
66b. Flowers white, pinkish or purplish.
67a. Fruit ribs corky-thickened, dorsal and intermediate ribs rounded, very prominent, lateral
ribs broadly winged ............................................................................................................. 90. Phlojodicarpus
67b. Fruit ribs not corky-thickened, dorsal ribs filiform, prominent to slightly prominent,
lateral ribs narrowly to broadly winged.
68a. Calyx teeth obsolete or inconspicuous; bracts present, bracteoles many; lateral ribs of fruit
conspicuously winged ........................................................................................................... 91. Peucedanum
68b. Calyx teeth conspicuous, subulate or triangular-subulate; bracts and bracteoles absent or
occasionally bracteoles 1–2, caducous; lateral ribs of fruit thickened, slightly winged ... 92. Chuanminshen
61b. Lateral mericarp wings thickened, margin rigid (vascular bundle near margin) (subtribe
Tordylinae).
69a. Petals yellow, equal, apex obtuse-rounded or truncate with an inflexed lobule; fruit vittae long,
APIACEAE

filiform, extending to fruit base ................................................................. 94. Pastinaca
69b. Petals greenish, whitish or purplish, unequal, usually outer petals markedly enlarged, radiant,
apex 2-lobed, with a narrowly inflexed lobule; fruit vittae short, clavate, not extending to
fruit base, or long, filiform extending to base.
70a. Fruit vittae long, filiform, not clavate, usually extending to base, fruit densely pubescent.
70b. Fruit vittae short, clavate, usually not extending to base (very rarely filiform and extending to
base), fruit glabrous or glabrescent.
72a. Bracts absent or few, caducous, bracteoles linear .................................................. 96. Heracleum
72b. Bracts and bracteoles numerous, large, lanceolate-ovate, persistent in fruit ................... 98. Tordyliopsis
8b. Commissure face of seed deeply concave or sulcate.
73a. Fruit oblong or slightly elongate, cylindrical, beaked; druse crystals abundant in parenchyma surrounding
carpophore (tribe Scandicineae).
74a. Fruit round-ovoid, ovoid to oblong, setulose or bristly, usually in longitudinal rows.
74b. Fruit cylindrical and beaked, glabrous or bristly but not in longitudinal rows.
73a. Fruit round-ovoid, ovoid to oblong, setulose or bristly, usually in longitudinal rows.
76a. Fruit ribs acute, narrowly winged; vittae obscure when mature .................................. 9. Osmorhiza
76b. Fruit ribs rounded, unwinged; vittae conspicuous.
77a. Apex of fruit shortly or long-beaked; vittae small.
77b. Apex of fruit obtuse or acute, not beaked; vittae large.
79a. Fruit elongate, cylindrical; vittae 1 in each furrow.
80a. Rootstock narrow conic ................................................................. 6. Chaerophyllum
80b. Rootstock tuber-like, globose ............................................................ 10. Krasnovia
79b. Fruit linear-oblong; vittae 2–4 in each furrow.
81a. Calyx teeth obsolete; petals white, apex notched ........................................ 7. Sphallerocarpus
81b. Calyx teeth conspicuous, persistent; petals purple, apex unnotched ......................... 13. Chaerophyllipsis
73b. Fruit globose, ovoid to cylindrical, not beaked; druse crystals absent in parenchyma surrounding
carpophore.
82a. Fruit globose-ovid, pericarp hard (tribe Coriandreae).
83a. Plants annual or biennial; cauline leaves heteromorphic; fruit globose ...................... 15. Coriandrum
83b. Plants perennial; cauline leaves not heteromorphic; fruit biglobose ..................... 16. Schrenkia
82b. Fruit cylindrical to ovoid, pericarp not hard (tribe Smyrnieae).
84a. Fruit ribs unwinged; mericarp rounded in cross section or near pentagonal.
85a. Umbels sessile, appearing simple; petals plane, apex acute, slightly incurved .......... 17. Oreomyrrhis
85b. Umbels pedunculate, obviously compound; petal apex narrowly inflexed.
86a. Primary and secondary fruit ribs conspicuous ............................................. 22. Chamaesium
86b. Primary fruit ribs conspicuous, secondary ribs obscure.
87a. Seed face deeply concave or sulcate.
88a. Fruit ribs faint, furrows obscure; vittae numerous ............................................. 21. Changium
88b. Fruit ribs filiform, prominent, furrow conspicuous; vittae 1–3 in each furrow.
89a. Rootstock tuber-like; ultimate leaf segments narrowly linear ............................... 33. Scaligeria
89b. Rootstock not tuber-like; ultimate leaf segments oblong to broadly ovate.
90a. Fruit vittae 1 in each furrow, 2 on commissure ........................................... 26. Cyclorrhiza
90b. Fruit vittae 3–5 in each furrow, 6 on commissure ............................................. 25. Vicatia
87b. Seed face plane or slightly concave, never sulcate.
91a. Fruit narrowly long-ovate, tapering toward apex, base not cordate .................... 19. Meeboldia
91b. Fruit ovoid-globose or long-ellipsoid, apex rounded, base usually cordate.
92a. Fruit surface usually tuberculate .......................................................... 30. Trachydium
92b. Fruit glabrous, not tuberculate.
93a. Petal midvein inconspicuous; stylopodium depressed ........................................ 20. Tongoloa
93b. Petal midvein conspicuous; stylopodium conic.
94a. Leaves 2-ternate-pinnate; ultimate segments broadly ovate-rhombic; petals dark
purple ........................................................................................................ 29. Melanosciadium
94b. Leaves 1–2-pinnate, rarely undivided, ultimate segments oblanceolate, obovate
APIACEAE

or long-ovate; petals white, yellow or purple ...................................................... 18. Physospermopsis

84b. Fruit ribs winged (or unwinged and corky-thickened); mericarp pentagonal in cross section or slightly flattened dorsally.

95a. Fruit ribs corky-thickened, winged or unwinged .................................................................................... 32. Prangos
95b. Fruit ribs thinly winged, not corky.

96a. Bracts and bracteoles few to many, small, undivided.

96b. Bracts and bracteoles well developed, membranous-margined, usually pinnate or apex 3-lobed.

98a. Petals yellow, apex not narrow and inflexed; dorsal ribs filiform, lateral ribs narrow-winged ................................................................................................................................... 28. Sinolimprichtia
98b. Petals white or pinkish, apex narrow, inflexed; fruit ribs usually undulate, cristate or semi-winged.

99a. Bracteoles herbaceous, often falling in fruit; umbellules not densely crowded (pedicels conspicuous) ..................................................................................................................... 23. Pleurospermum
99b. Bracteoles stiff, papery, persistent in fruit; umbellules densely crowded (pedicels very short) ...................................................................................................................... 24. Pleurospermopsis

Multi-access key to genera

A multi-access system of identification allows the user to select from a suite of characters and so provides a means of identification for incomplete or otherwise less than optimal material (e.g., flowering specimens with no fruit). This system has proved to be very effective for Apiaceae in other geographic regions (e.g., Hedge and Lamond, Fl. Turkey 4: 208–288. 1972), and the following key follows the format successfully developed for the Turkish genera. These paper-based systems are the precursors of current interactive electronic identification tools (e.g., “ActKey” datasets on the Flora of China web site), but we believe that the simplified, printed version still has its place.

Instructions

Compare the plant material in hand with the following list of characteristics. Record, in order, the code letters for the characters judged applicable to the material, and miss out codes for absent features (e.g., petal color code A or B would be missing when only fruiting material is available). The resultant formula can then be traced in the alphabetically arranged index of formulas. Even if some letters are missing, it is often possible to identify the genus by checking the possible combinations against the index.

List of characteristics

<table>
<thead>
<tr>
<th>Code</th>
<th>Characteristics</th>
<th>Guidance notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Petals white, creamy white, pink, purplish, violet, red, pale blue or green</td>
<td>Some taxa with white petals dry bright yellow (e.g., Daucus) but should still be coded as A</td>
</tr>
<tr>
<td>B</td>
<td>Petals distinctly yellow</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Calyx teeth obsolete</td>
<td>Calyx teeth can be observed in flower or fruit (when persistent)</td>
</tr>
<tr>
<td>D</td>
<td>Calyx teeth small, triangular</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Calyx teeth large, lanceolate or subulate</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Simple, entire or toothed</td>
<td>Transitions between F and G occur, and in most cases these are coded as G; in doubtful cases both states should be considered</td>
</tr>
<tr>
<td>G</td>
<td>Lobed, ternate or palmate</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>1-pinnate or pinnatisect</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>2-pinnate/2-ternate/2-pinnatisect or more</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>Length more than 3 × width</td>
<td>Length includes the stylodium, but not the styles; borderline cases are coded as K</td>
</tr>
<tr>
<td>K</td>
<td>Length less than 3 × width</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>Surface ornamented with hairs or spines, bristles, scales or papillae</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Surface glabrous, smooth, ribbed or ribs developed into wavy wings</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>Mericarps strongly compressed, thickness (excluding wings) less than 1/3 × width in cross section</td>
<td>Immature fruits of the flat group may appear to be not strongly compressed (e.g., Peucedanum). In doubtful cases both states should be considered</td>
</tr>
<tr>
<td>O</td>
<td>Mericarps (excluding wings) not strongly compressed, thickness more than 1/3 × width</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>Simple, entire</td>
<td>This character is best observed in flowering material as bracteoles may fall after flowering; plants with</td>
</tr>
<tr>
<td>Q</td>
<td>Pinnately divided or lobed</td>
<td></td>
</tr>
</tbody>
</table>

*Multi-access key to genera*
APIACEAE

<table>
<thead>
<tr>
<th>R</th>
<th>Absent</th>
<th>occasionally divided bracteoles should be coded P</th>
</tr>
</thead>
</table>

| Vittae arrangement |
|---|---|---|
| S | 1 in every furrow | Code S should only be used where all furrows have only 1 vitta, otherwise use code T |
| T | More than 1 in at least some furrows |
| U | Absent or obscure |

| Stem base |
|---|---|---|
| V | Stem base (caudex) clothed in fibrous remnant leaf sheaths, often densely so |
| W | Stem base clothed in papery remnant leaf sheaths |
| X | Stem base naked, remnant sheaths absent |

| Life history |
|---|---|---|
| Y | Annual |
| Z | Biennial or perennial |

Example

An unrecognized genus with white flowers, obsolete calyx teeth, ternate leaves, long, narrow, bristly, terete fruit with obscure vittae, simple bracteoles, and perennial stem base without remnant sheaths will be found to have the formula ACGJLOPUXZ. Tracing this formula in the alphabetic index will show that the plant belongs to the genus Osmorhiza. In some cases several genera will share the same formula, and bullet-pointed (●) supplementary features are added which will help differentiate between these genera or, in the case of a morphologically diverse genus, the group of species that has that formula within the genus. For example a plant from Xinjiang with white flowers, small, triangular calyx teeth, 2-pinnate leaves, short, flat, scaly fruit with solitary vittae in the furrows, simple bracteoles, and perennial stem base with fibrous collar would have the formula ADIKLNPVSZ. This formula applies to Heracleum, Saposhnikovia, Semenovia, and Zosima. The plant is compared with the supplementary features for these four genera and is seen to have outer parts of the fruit wing inflated and corky, and is therefore identified as Zosima. When a character used in the formula is not present on incomplete material, all alternative states for the character should be tried, and in most cases it will still be possible to identify the genus using the key.

Index of formulas

<table>
<thead>
<tr>
<th>Formula</th>
<th>Supplementary features</th>
<th>Genus</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACFKLOPTXZ</td>
<td>Fruit laterally compressed; bracts absent; fruit lateral ribs obscure</td>
<td>48. Pimpinella</td>
</tr>
<tr>
<td>ACFKLOPTYX</td>
<td>Fruit laterally compressed; bracts small, fruit lateral ribs prominent</td>
<td>1. Hydrocotyle</td>
</tr>
<tr>
<td>ACFKMNPUXZ</td>
<td>Fruit dorsally compressed; bracts 2, large, leaf-like</td>
<td>3. Dickinsia</td>
</tr>
<tr>
<td>ACFKMOPTVZ</td>
<td>Fruit often tuberculate</td>
<td>30. Trachydium</td>
</tr>
<tr>
<td>ACFKMOPTXZ</td>
<td>Bracteoles enlarged, enveloping flowers; leaves lanceolate</td>
<td>34. Bupleurum</td>
</tr>
<tr>
<td>ACFKMOPTXY</td>
<td>Bracteoles small, linear, shorter than flowers; leaves ovate</td>
<td>48. Pimpinella</td>
</tr>
<tr>
<td>ACFKMOQTVZ</td>
<td>Young fruit usually emerald green</td>
<td>18. Physospermopsis</td>
</tr>
<tr>
<td>ACFKMOQTYX</td>
<td>Young fruit pale to dark green</td>
<td>30. Trachydium</td>
</tr>
<tr>
<td>ACFKMORTVZ</td>
<td>Fruit often tuberculate</td>
<td>30. Trachydium</td>
</tr>
<tr>
<td>ACFKMORTXY</td>
<td>Fruit often tuberculate</td>
<td>48. Pimpinella</td>
</tr>
<tr>
<td>ACGJLOPUXZ</td>
<td>Fruit narrow, club-shaped, bristles upwardly pointed</td>
<td>9. Osmorhiza</td>
</tr>
<tr>
<td>ACGKLOPTXY</td>
<td>Plants aromatic; peduncles very short, umbels usually leaf-opposed</td>
<td>37. Apium</td>
</tr>
<tr>
<td>ACGKLOPTXZ</td>
<td>Plants aromatic; peduncles very short, umbels usually leaf-opposed</td>
<td>37. Apium</td>
</tr>
<tr>
<td>ACGKMOPTVZ</td>
<td>Plants aromatic; peduncles very short, umbels usually leaf-opposed</td>
<td>45. Sinocarum</td>
</tr>
<tr>
<td>ACHJMOPSVZ</td>
<td>Plants aromatic; peduncles very short, umbels usually leaf-opposed</td>
<td>49. Acronema</td>
</tr>
<tr>
<td>ACHKLOPSVZ</td>
<td>Plants aromatic; peduncles very short, umbels usually leaf-opposed</td>
<td>33. Apium</td>
</tr>
<tr>
<td>ACHMOPSVZ</td>
<td>Plants aromatic; peduncles very short, umbels usually leaf-opposed</td>
<td>37. Apium</td>
</tr>
<tr>
<td>ACHKLOPSVZ</td>
<td>Arid land plants; fruit densely white pubescent</td>
<td>41. Eriocyclo</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>ACHKLOPTXZ</td>
<td>Mesic plants; fruits scabrous</td>
<td>48.</td>
</tr>
<tr>
<td>ACHKLORTXY</td>
<td>Mesic plants; fruits scabrous</td>
<td>48.</td>
</tr>
<tr>
<td>ACHKMNPVZ</td>
<td>Vittae usually clavate, to 3/4 length of mericarp</td>
<td>96.</td>
</tr>
<tr>
<td>ACHKMOPSVZ</td>
<td>Bract and bracteole margins usually white membranous</td>
<td>23.</td>
</tr>
<tr>
<td>ACHKOPTVZ</td>
<td>Fruit often tuberculate</td>
<td>30.</td>
</tr>
<tr>
<td>ACHKMOPTWZ</td>
<td>High altitude, stemless plants; commissure vittae 8</td>
<td>47.</td>
</tr>
<tr>
<td>ACHKMOPTXZ</td>
<td>■ Plants slender; petals usually long acuminate, rarely acute</td>
<td>49.</td>
</tr>
<tr>
<td>ACHKMOQTVZ</td>
<td>Young fruit usually emerald green</td>
<td>72.</td>
</tr>
<tr>
<td>ACHKMORSXY</td>
<td>Plant aromatic; pedicules very short, umbels usually leaf-opposed</td>
<td>37.</td>
</tr>
<tr>
<td>ACHKMORSXZ</td>
<td>Plant aromatic; pedicules very short, umbels usually leaf-opposed</td>
<td>37.</td>
</tr>
<tr>
<td>ACHKMORTVZ</td>
<td>Fruit often tuberculate</td>
<td>30.</td>
</tr>
<tr>
<td>ACHKMORTXY</td>
<td>■ Fruit beak long</td>
<td>14.</td>
</tr>
<tr>
<td>ACIJLOQUXY</td>
<td>Fruit beak long</td>
<td>8.</td>
</tr>
<tr>
<td>ACIJMOPSVZ</td>
<td>Bract and bracteole margins usually white membranous</td>
<td>23.</td>
</tr>
<tr>
<td>ACIJMOPXY</td>
<td>Bracteoles patent; pedicel apex glabrous; fruit linear-oblong</td>
<td>6.</td>
</tr>
<tr>
<td>ACIJMOPSXZ</td>
<td>Bracteoles patent; pedicel apex glabrous; fruit linear-oblong</td>
<td>6.</td>
</tr>
<tr>
<td>ACIJMOPUXZ</td>
<td>Bracteoles deflexed; pedicel apex hairy; fruit long-ovoid</td>
<td>8.</td>
</tr>
<tr>
<td>ACIKLNPSXZ</td>
<td>■ Vittae linear, long; fruit wings without marginal vascular bundle</td>
<td>82.</td>
</tr>
<tr>
<td>ACIKLNPTXZ</td>
<td>■ Vittae usually clavate, short; fruit wings with marginal vascular bundle</td>
<td>96.</td>
</tr>
<tr>
<td>ACIKLNQTZ</td>
<td>Fruit lateral rib wings broad, divergent at maturity, dorsal ribs thick</td>
<td>82.</td>
</tr>
<tr>
<td>ACIKLNPTXZ</td>
<td>■ Fruit lateral rib wings membranous, less than 2 × width of dorsal, closely</td>
<td>91.</td>
</tr>
<tr>
<td>ACIKLNPYSX</td>
<td>Arid land plants; fruit densely white pubescent</td>
<td>41.</td>
</tr>
<tr>
<td>ACIKLOPSXY</td>
<td>Fruit and ovary densely covered in clavate-tipped bristles</td>
<td>35.</td>
</tr>
<tr>
<td>ACIKLOPTXY</td>
<td>■ Bracts absent</td>
<td>40.</td>
</tr>
<tr>
<td>ACIKLOPTXZ</td>
<td>■ Bracts present</td>
<td>48.</td>
</tr>
<tr>
<td>ACIKLOPTXZ</td>
<td>■ Flowers, pedicels and rays dark purple; umbels small</td>
<td>29.</td>
</tr>
<tr>
<td>ACIKLORTXY</td>
<td>Bracts present</td>
<td>48.</td>
</tr>
<tr>
<td>ACIKLOPSXZ</td>
<td>■ Bracts linear or lanceolate, not membranous</td>
<td>48.</td>
</tr>
<tr>
<td>ACIKLOPTXZ</td>
<td>■ Bracts conspicuous, broad, membranous, pale green</td>
<td>54.</td>
</tr>
<tr>
<td>ACIKLORXZ</td>
<td>Bracts present</td>
<td>48.</td>
</tr>
<tr>
<td>ACIKMNPSXZ</td>
<td>■ Fruit lateral rib wings broader than dorsal, ribs without vascular bundles,</td>
<td>78.</td>
</tr>
<tr>
<td>ACIKMNPTXZ</td>
<td>■ Fruit ribs all broadly and thickly winged; Jilin</td>
<td>80.</td>
</tr>
<tr>
<td>ACIKMNPSXZ</td>
<td>■ Fruit ribs all broadly and thickly winged; Jilin</td>
<td>80.</td>
</tr>
<tr>
<td>ACIKMNPTXZ</td>
<td>■ Fruit ribs all winged, ribs with vascular bundles, vittae discrete, not</td>
<td>78.</td>
</tr>
<tr>
<td>ACIKMNPTXZ</td>
<td>■ Fruit ribs all winged, vittae discrete, linear, not encircling seed; leaf</td>
<td>79.</td>
</tr>
<tr>
<td>ACIKMNPSXZ</td>
<td>■ Fruit ribs all broadly and thickly winged; Jilin</td>
<td>82.</td>
</tr>
<tr>
<td>ACIKMNPSXZ</td>
<td>■ Fruit lateral rib wings broader than dorsal, ribs without vascular bundles,</td>
<td>82.</td>
</tr>
<tr>
<td>ACIKMNPSXZ</td>
<td>■ Fruit lateral rib wings broader than dorsal, lateral wings with marginal</td>
<td>82.</td>
</tr>
<tr>
<td>ACIKMNPSXZ</td>
<td>■ Fruit lateral rib wings membranous, less than 2 × width of dorsal, closely</td>
<td>91.</td>
</tr>
<tr>
<td>ACIKMNPTXZ</td>
<td>■ Fruit lateral rib wings broader than dorsal, lateral wings with marginal</td>
<td>96.</td>
</tr>
<tr>
<td>ACIKMNPSXZ</td>
<td>■ Fruit ribs all winged, vittae discrete, not encircling the seed; leaf sheaths narrow</td>
<td>79.</td>
</tr>
<tr>
<td>ACIKMNPSXZ</td>
<td>■ Fruit ribs all winged, vittae discrete, linear, not encircling seed; leaf sheaths broad</td>
<td>80.</td>
</tr>
<tr>
<td>Table Content</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fruit lateral rib wings broader than dorsal; vittae discrete, not encircling the seed; leaf sheaths broad; petals radiant; NE China</td>
<td>81. Czernaevia</td>
<td></td>
</tr>
<tr>
<td><strong>ACIKMPTXZ (continued)</strong></td>
<td>82. Angelica</td>
<td></td>
</tr>
<tr>
<td>• Fruit lateral rib wings broader than dorsal; vittae discrete, not encircling the seed; leaf sheaths broad; petals equal</td>
<td>91. Peucedanum</td>
<td></td>
</tr>
<tr>
<td><strong>ACIKMNQTVZ</strong></td>
<td>91. Peucedanum</td>
<td></td>
</tr>
<tr>
<td>Fruit lateral rib wings membranous, less than 2 × width of dorsal, closely appressed at maturity</td>
<td>53. Hyalolaena</td>
<td></td>
</tr>
<tr>
<td><strong>ACIKMOPSVZ</strong></td>
<td>67. Lithosciadium</td>
<td></td>
</tr>
<tr>
<td>Bracts and bracteoles margin usually white membranous; fruit ribs all winged, wings often sinuate, cristate or dentate</td>
<td>72. Ligusticium</td>
<td></td>
</tr>
<tr>
<td>Bracteoles broad, membranous; rays subequal; fruit oblong-ovoid, slightly dorsally compressed, ribs filiform; W Xinjiang</td>
<td>43. Anni</td>
<td></td>
</tr>
<tr>
<td>Bracteoles fused at base; stylopodium deeply lobed; N Xinjiang</td>
<td>52. Seselopsis</td>
<td></td>
</tr>
<tr>
<td>Bracteoles linear; fruit ovate, dorsally compressed, lateral ribs usually winged, dorsal ribs usually prominent</td>
<td>68. Cnidium</td>
<td></td>
</tr>
<tr>
<td>Rays and pedicels often very unequal</td>
<td>44. Carum</td>
<td></td>
</tr>
<tr>
<td><strong>ACIKMOPSXVZ</strong></td>
<td>38. Petrosilimum</td>
<td></td>
</tr>
<tr>
<td>Leaves shiny, aromatic (parsley), upper leaf segments linear</td>
<td>43. Ammi</td>
<td></td>
</tr>
<tr>
<td>Bracts 2-pinnate, filiform, long; fruit ovoid-oblong, ribs acute</td>
<td>33. Scaligeria</td>
<td></td>
</tr>
<tr>
<td>Bracts linear or absent; fruit ovoid-globose, ribs carinate or narrowly winged; N Sichuan, SE Xizang, N Yunnan</td>
<td>50. Harrysmithia</td>
<td></td>
</tr>
<tr>
<td><strong>ACIKMOPSWZ</strong></td>
<td>52. Seselopsis</td>
<td></td>
</tr>
<tr>
<td>Bracts linear or absent; fruit ovoid-oblong, ribs acute; plant with a globose tuber; W Xinjiang</td>
<td>10. Krasnovia</td>
<td></td>
</tr>
<tr>
<td>Bracts linear; bracts absent; fruit ribs all narrowly winged, vittae large; W Xinjiang</td>
<td>52. Seselopsis</td>
<td></td>
</tr>
<tr>
<td>Bracts 2-pinnate, filiform, long; leaflets filiform; fruit ovoid-oblong</td>
<td>43. Anni</td>
<td></td>
</tr>
<tr>
<td>Leaflets linear; bracts absent; fruit ribs all narrowly winged, vittae large; W Xinjiang</td>
<td>52. Seselopsis</td>
<td></td>
</tr>
<tr>
<td>Leaflets obovate; bracts linear; fruit oblong-ovoid, slightly dorsally compressed, all ribs narrow, corky</td>
<td>68. Cnidium</td>
<td></td>
</tr>
<tr>
<td><strong>ACIKMOPTVZ</strong></td>
<td>72. Ligusticium</td>
<td></td>
</tr>
<tr>
<td>Bracteoles linear; fruit ovate, dorsally compressed, lateral ribs usually winged, dorsal ribs usually prominent</td>
<td>32. Prangos</td>
<td></td>
</tr>
<tr>
<td>Bracteoles linear; fruit large, oblong to ellipsoid, mesocarp thick, corky, seed face involute, T-shaped; W Xinjiang</td>
<td>53. Hyalolaena</td>
<td></td>
</tr>
<tr>
<td>Bracteoles broad, membranous; fruit oblong-ovoid, slightly dorsally compressed, ribs filiform, W Xinjiang</td>
<td>77. Oreocomopsis</td>
<td></td>
</tr>
<tr>
<td>Bracteoles linear, very long, 2–3 × umbellule; S Xizang</td>
<td>44. Carum</td>
<td></td>
</tr>
<tr>
<td><strong>ACIKMOPTWZ</strong></td>
<td>21. Changium</td>
<td></td>
</tr>
<tr>
<td>Plant dying down in summer; fruit ribs obscure, vittae numerous throughout mesocarp, seed face deeply sulcate; E China</td>
<td>44. Carum</td>
<td></td>
</tr>
<tr>
<td>Bracteoles linear; rays often very unequal; fruit oblong-ellipsoid, slightly laterally compressed</td>
<td>7. Sphalleroecarpus</td>
<td></td>
</tr>
<tr>
<td><strong>ACIKMOPTXZ</strong></td>
<td>25. Vicatia</td>
<td></td>
</tr>
<tr>
<td>Bracteoles linear, deflexed; fruit linear-oblong, ribs prominent, seed face broadly sulcate</td>
<td>31. Conium</td>
<td></td>
</tr>
<tr>
<td>Petals clawed; seed face deeply sulcate; fruit ribs filiform</td>
<td>45. Sinocarum</td>
<td></td>
</tr>
<tr>
<td>Stem purple spotted; vittae numerous encircling seed; fruit ribs sinuate ridged</td>
<td>48. Pimpinella</td>
<td></td>
</tr>
<tr>
<td>Petals acute or obtuse; leaf sheaths broad; rhizome elongate</td>
<td>49. Acronema</td>
<td></td>
</tr>
<tr>
<td>Fruit ribs filiform, vittae several in ring around seed; seed face plane</td>
<td>54. Nothosmyrnium</td>
<td></td>
</tr>
<tr>
<td>Petals usually long acuminate, rarely acute; seed face plane</td>
<td>23. Pleurosperrnum</td>
<td></td>
</tr>
<tr>
<td>Bracts large, conspicuous, often reflexed after flowering; ribs filiform</td>
<td>17. Oreomyrrhis</td>
<td></td>
</tr>
<tr>
<td><strong>ACIKMQSVZ</strong></td>
<td>30. Trachydium</td>
<td></td>
</tr>
<tr>
<td>Bracts and bracteole margins usually white membranous; fruit wings often sinuate, cristate or dentate</td>
<td>18. Physospermopsis</td>
<td></td>
</tr>
<tr>
<td><strong>ACIKMQSXZ</strong></td>
<td>17. Oreomyrrhis</td>
<td></td>
</tr>
<tr>
<td>Rosette perennial; bracts and bracteoles longer than flowers; Taiwan</td>
<td>30. Trachydium</td>
<td></td>
</tr>
<tr>
<td><strong>ACIKMQTVZ</strong></td>
<td>18. Physospermopsis</td>
<td></td>
</tr>
<tr>
<td>Fruit often tuberculate</td>
<td>23. Pleurosperrnum</td>
<td></td>
</tr>
</tbody>
</table>
APIACEAE

- Bracts and bracteole margins usually white membranous; fruit wings often sinuate, cristate or dentate

**ACIKMOQTVZ (continued)**
- Bracts and bracteoles 2–3-pinnate; fruit ribs narrow, slightly winged

62. **Schulzia**

- Leaflets linear, long; fruit ribs prominent; Xinjiang

71. **Cenolophium**

- Leaflets broad; fruit ribs all winged; Jilin

80. **Coelopleurum**

- Leaves filiform; umbels almost sessile, central flower almost sessile

56. **Cyclospermum**

- Rays subequal; fruit ovoid

48. **Pimpinella**

- Petals obtuse or rounded, clawed; leaf sheaths narrow

20. **Tongoloa**

- Petals acute or obtuse; leaf sheaths broad; rhizome elongate

45. **Sinocarum**

- Petals usually long acuminate, rarely acute; rhizome globose

49. **Acronema**

- Young fruit usually emerald green

18. **Physospermopsis**

- Fruit ribs all narrowly winged

23. **Pleurospermum**

- Bract and bracteole margin usually white membranous

24. **Pleurospermopsis**

- Fruits sparsely to moderately hairy, vittae usually clavate, to 3/4 length of mericarp

96. **Heracleum**

- Fruit densely white villous, vittae filiform, long

97. **Semenovia**

- Arid land plants; fruit densely white villous, ribs rounded or keeled

41. **Eriocycla**

- Fruit variously hairy but not densely villous, ribs filiform

60. **Seseli**

- Bract and bracteole margin usually white membranous

23. **Pleurospermum**

- Fruits sparsely to moderately hairy, vittae usually clavate, to 3/4 length of mericarp

96. **Heracleum**

- Fruit densely white villous, vittae filiform, long

97. **Semenovia**

- Bract and bracteole margin usually white membranous

23. **Pleurospermum**

- Bract and bracteole margin concolorous; fruit ribs all narrowly winged

97. **Semenovia**

- Bract and bracteole margin concolorous; fruit ribs rounded or keeled

60. **Seseli**

- Stylodium flat, margin expanded (flanged); primary and secondary fruit ribs prominent to narrowly winged; petals greenish

22. **Chamaesium**

- Bract and bracteole margin usually white membranous

23. **Pleurospermum**

- Bracteoles concolorous, fused at base; fruit slightly dorsally compressed, ribs equal

60. **Seseli**

- Fruit moderately to strongly dorsally compressed, lateral ribs usually winged, dorsal ribs prominent

72. **Ligusticum**

- Bract and bracteole margin usually white membranous

23. **Pleurospermum**

- Bracts and bracteoles stiff, rigid, persistent in fruit

24. **Physospermopsis**

- Rays very slender; umbellules usually 2- or 3-flowered

46. **Pternopetalum**

- Rays very slender; umbellules usually 2- or 3-flowered

46. **Pternopetalum**

- Wetland and water plants; leaflets sessile

58. **Stium**

- Bract and bracteole margin usually white membranous

23. **Pleurospermum**
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADHKMOQSWZ</td>
<td>● Stylopodium flat, margin expanded (flanged); primary and secondary fruit ribs prominent to narrowly winged; petals greenish</td>
</tr>
<tr>
<td>ADHKMOQTVZ</td>
<td>● Bract and bracteole margin usually white membranous</td>
</tr>
<tr>
<td>ADHKMORSWZ</td>
<td>● Young fruit usually emerald green, ribs filiform</td>
</tr>
<tr>
<td>ADHKMORTVZ</td>
<td>● Bract and bracteole margin usually white membranous; fruit slightly dorsally compressed, ribs equal, narrowly winged</td>
</tr>
<tr>
<td>ADHKMORTXZ</td>
<td>● Fruit moderately to strongly dorsally compressed, lateral ribs usually winged, dorsal ribs prominent</td>
</tr>
<tr>
<td>ADIKLSVXZ</td>
<td>Bract and bracteole margin usually white membranous</td>
</tr>
<tr>
<td>ADIKLOPSXZ</td>
<td>● Ovaries densely white-tuberculate; fruit secondary ribs prominent, ribs each with 1 large vitta; NE China</td>
</tr>
<tr>
<td>ADIKLOPSXY</td>
<td>Fruit densely white villous, ribs rounded or keeled</td>
</tr>
<tr>
<td>ADIKLOPSXZ</td>
<td>● Plants dwarf, almost stemless; fruit ribs with stiff membranous denticles and short hairs; high altitudes; Xinjiang</td>
</tr>
<tr>
<td>ADIKLOPSXZ</td>
<td>● Fruit variously hairy but not densely villous, ribs filiform</td>
</tr>
<tr>
<td>ADIKMNPSXZ</td>
<td>Fruit ribs equal, filiform</td>
</tr>
<tr>
<td>ADIKMNPSXZ</td>
<td>● Fruit lateral rib wings membranous, less than 2 × width of dorsal</td>
</tr>
<tr>
<td>ADIKMNPTVZ</td>
<td>● Fruit pubescent but not densely so, vittae usually clavate, to 3/4 length of mericarp</td>
</tr>
<tr>
<td>ADIKMNPTXZ</td>
<td>● Fruit pubescent but not densely so, vittae usually clavate, to 3/4 length of mericarp</td>
</tr>
<tr>
<td>ADIKMNPSXZ</td>
<td>● Fruit ribs equal, filiform</td>
</tr>
<tr>
<td>ADIKMNPSXZ</td>
<td>● Fruit lateral rib wings membranous, less than 2 × width of dorsal</td>
</tr>
<tr>
<td>ADIKMNPTVZ</td>
<td>Fruit densely white pilose or scabrid, vittae long, filiform</td>
</tr>
<tr>
<td>ADIKMNPTXZ</td>
<td>● Fruit pubescent but not densely so, vittae usually clavate, to 3/4 length of mericarp</td>
</tr>
<tr>
<td>ADIKMNPSXZ</td>
<td>● Fruit ribs equal, filiform</td>
</tr>
<tr>
<td>ADIKMNQXZ</td>
<td>Fruit with glochidiate prickles, rays incurved after anthesis</td>
</tr>
<tr>
<td>ADIKMNPSXZ</td>
<td>● Fruit lateral rib wings membranous, less than 2 × width of dorsal</td>
</tr>
<tr>
<td>ADIKMNQXZ</td>
<td>Fruit with glochidiate prickles, rays incurved after anthesis</td>
</tr>
<tr>
<td>ADIKMNPSXZ</td>
<td>● Medium stature plants, moderate altitudes; fruit slightly to moderately dorsally compressed, ribs equal, prominent</td>
</tr>
<tr>
<td>ADIKMNPSXZ</td>
<td>● Dwarf plants of high altitudes; fruit dorsally compressed, ribs all narrowly winged; W Sichuan, Xinjiang, Xizang</td>
</tr>
<tr>
<td>ADIKMOPSVZ</td>
<td>Marsh plants; rootstock thick with transverse air chambers, sap yellow; fruit ovoid-globose, ribs thick, corky</td>
</tr>
<tr>
<td>APIACEAE</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td></td>
</tr>
<tr>
<td>• Rays often very unequal; fruit oblong-ellipsoid, slightly laterally compressed, ribs filiform</td>
<td>44. <em>Carum</em></td>
</tr>
<tr>
<td>• Rays very slender; umbellules usually 2- or 3-flowered</td>
<td>46. <em>Pternopetalum</em></td>
</tr>
<tr>
<td><strong>ADIKMOPTVZ</strong></td>
<td><strong>60. <em>Seseli</em></strong></td>
</tr>
<tr>
<td>• Fruit slightly to moderately dorsally compressed, ribs equal, prominent</td>
<td>72. <em>Ligusticum</em></td>
</tr>
<tr>
<td><strong>ADIKMOPTVZ (continued)</strong></td>
<td></td>
</tr>
<tr>
<td>• Fruit moderately to strongly dorsally compressed, lateral ribs usually winged, dorsal ribs prominent</td>
<td></td>
</tr>
<tr>
<td>• Flowers in tight globose heads, petals dark purple-brown</td>
<td>74. <em>Hapiosphaera</em></td>
</tr>
<tr>
<td><strong>ADIKMOPTXZ</strong></td>
<td><strong>20. <em>Tongoloa</em></strong></td>
</tr>
<tr>
<td>• Petals obtuse or rounded, clawed; leaf sheaths narrow</td>
<td>27. <em>Notopterygium</em></td>
</tr>
<tr>
<td>• Fruit slightly dorsally compressed, ribs all broadly winged</td>
<td>45. <em>Sinocarum</em></td>
</tr>
<tr>
<td>• Petals acute or obtuse; leaf sheaths broad; rhizome elongate</td>
<td></td>
</tr>
<tr>
<td>• Rays very slender; umbellules usually 2- or 3-flowered</td>
<td>46. <em>Pternopetalum</em></td>
</tr>
<tr>
<td>• Petals usually long acuminate, rarely acute; rhizome tuberous</td>
<td>49. <em>Acronema</em></td>
</tr>
<tr>
<td><strong>ADIKMOPUVZ</strong></td>
<td></td>
</tr>
<tr>
<td>Leaves very finely divided, fruit bi-globose, pericarp hard; Xinjiang</td>
<td>16. <em>Schrenkia</em></td>
</tr>
<tr>
<td><strong>ADIKMOPUXY</strong></td>
<td><strong>15. <em>Coriandrum</em></strong></td>
</tr>
<tr>
<td>Fruit spherical, pericarp hard; plant strongly aromatic (coriander)</td>
<td></td>
</tr>
<tr>
<td><strong>ADIKMOQSVZ</strong></td>
<td><strong>73. <em>Pachypleurum</em></strong></td>
</tr>
<tr>
<td>Dwarf; high-altitude plants; fruit ribs narrowly winged; Sichuan, Xinjiang, Xizang</td>
<td></td>
</tr>
<tr>
<td><strong>ADIKMOQTVZ</strong></td>
<td></td>
</tr>
<tr>
<td>• Young fruit usually emerald green, ribs filiform</td>
<td>18. <em>Physospermopsis</em></td>
</tr>
<tr>
<td>• Stem very thick; bracteoles 2–3-pinnate; fruit ribs narrowly winged</td>
<td>28. <em>Sinoimprichtia</em></td>
</tr>
<tr>
<td>• Fruit moderately to strongly dorsally compressed, lateral ribs usually winged, dorsal ribs prominent</td>
<td>72. <em>Ligusticum</em></td>
</tr>
<tr>
<td><strong>ADIKMOQTXZ</strong></td>
<td></td>
</tr>
<tr>
<td>Fruit ribs all broadly winged; bracteoles pinnate</td>
<td>27. <em>Notopterygium</em></td>
</tr>
<tr>
<td><strong>ADIKMORTVZ</strong></td>
<td><strong>60. <em>Seseli</em></strong></td>
</tr>
<tr>
<td><strong>ADIKMORTXZ</strong></td>
<td></td>
</tr>
<tr>
<td>• Petals obtuse or rounded, clawed; leaf sheaths narrow</td>
<td>20. <em>Tongoloa</em></td>
</tr>
<tr>
<td>• Petals acute or obtuse; leaf sheaths broad; rhizome elongate</td>
<td>45. <em>Sinocarum</em></td>
</tr>
<tr>
<td>• Petals usually long acuminate, rarely acute</td>
<td>49. <em>Acronema</em></td>
</tr>
<tr>
<td><strong>AEFKLOPUXZ</strong></td>
<td></td>
</tr>
<tr>
<td>Flowers sessile in heads; leaves spinose</td>
<td>5. <em>Eryngium</em></td>
</tr>
<tr>
<td><strong>AEGKLNPTXZ</strong></td>
<td><strong>85. <em>Glehnia</em></strong></td>
</tr>
<tr>
<td>Coastal plant; ribs all corky winged</td>
<td></td>
</tr>
<tr>
<td><strong>AEGKLOPSXZ</strong></td>
<td><strong>4. <em>Sanicula</em></strong></td>
</tr>
<tr>
<td>Fruit with spines or bristles, fertile flowers few per umbellule</td>
<td></td>
</tr>
<tr>
<td><strong>AEGKLOPXZ</strong></td>
<td><strong>4. <em>Sanicula</em></strong></td>
</tr>
<tr>
<td>Fruit with spines or bristles, fertile flowers few per umbellule</td>
<td></td>
</tr>
<tr>
<td><strong>AEGKMOPSXZ</strong></td>
<td><strong>46. <em>Pternopetalum</em></strong></td>
</tr>
<tr>
<td>Rays very slender, umbellules usually 2- or 3-flowered</td>
<td></td>
</tr>
<tr>
<td><strong>AEGKMOPTXZ</strong></td>
<td><strong>46. <em>Pternopetalum</em></strong></td>
</tr>
<tr>
<td>Rays very slender, umbellules usually 2- or 3-flowered</td>
<td></td>
</tr>
<tr>
<td><strong>AEGKMOPUXZ</strong></td>
<td><strong>46. <em>Pternopetalum</em></strong></td>
</tr>
<tr>
<td>Rays very slender, umbellules usually 2- or 3-flowered</td>
<td></td>
</tr>
<tr>
<td><strong>AEHKLNPTXZ</strong></td>
<td><strong>85. <em>Glehnia</em></strong></td>
</tr>
<tr>
<td>Coastal plant; ribs all corky winged</td>
<td></td>
</tr>
<tr>
<td><strong>AEHKLOPTXZ</strong></td>
<td><strong>12. <em>Turgenia</em></strong></td>
</tr>
<tr>
<td>Fruit densely bristly, secondary ribs prominent</td>
<td></td>
</tr>
<tr>
<td><strong>AEHKMOPTXZ</strong></td>
<td><strong>46. <em>Pternopetalum</em></strong></td>
</tr>
<tr>
<td>Rays very slender, umbellules usually 2- or 3-flowered</td>
<td></td>
</tr>
<tr>
<td><strong>AEHKMOPUXZ</strong></td>
<td></td>
</tr>
<tr>
<td>Rays very slender, umbellules usually 2- or 3-flowered</td>
<td></td>
</tr>
<tr>
<td><strong>AEHKLNPXXZ</strong></td>
<td></td>
</tr>
<tr>
<td>Coastal plant; ribs all corky winged</td>
<td></td>
</tr>
<tr>
<td><strong>AEHKLOPSXY</strong></td>
<td><strong>12. <em>Turgenia</em></strong></td>
</tr>
<tr>
<td>Fruit densely bristly, secondary ribs prominent</td>
<td></td>
</tr>
<tr>
<td><strong>AEHKMOPXXZ</strong></td>
<td><strong>46. <em>Pternopetalum</em></strong></td>
</tr>
<tr>
<td>Rays very slender, umbellules usually 2- or 3-flowered</td>
<td></td>
</tr>
<tr>
<td>• Water and marsh plants; fruit ribs thick, corky</td>
<td>61. <em>Oenanthe</em></td>
</tr>
<tr>
<td><strong>AEHKMOPTXZ</strong></td>
<td><strong>46. <em>Pternopetalum</em></strong></td>
</tr>
<tr>
<td>• Land plants; fruit ribs filiform</td>
<td>48. <em>Pimpinella</em></td>
</tr>
<tr>
<td>• Rays very slender, umbellules usually 2- or 3-flowered</td>
<td></td>
</tr>
<tr>
<td>• Water plants; fruit ovoid, 2-globose, exocarp thick, corky, vittae small, forming a continuous band around the seed</td>
<td>57. <em>Berula</em></td>
</tr>
<tr>
<td><strong>AEHKMQQTZV</strong></td>
<td><strong>72. <em>Ligusticum</em></strong></td>
</tr>
<tr>
<td>Land plants; fruit moderately to strongly dorsally compressed, lateral ribs usually winged, dorsal ribs prominent</td>
<td></td>
</tr>
<tr>
<td><strong>AEIKLNPXXVZ</strong></td>
<td><strong>90. <em>Phlojodicarpus</em></strong></td>
</tr>
<tr>
<td>Fruit ribs thick, corky, lateral ribs broadly winged; NE China</td>
<td></td>
</tr>
<tr>
<td><strong>AEIKLNPVXXZ</strong></td>
<td><strong>98. <em>Tordyliopsis</em></strong></td>
</tr>
<tr>
<td>Bracts and bracteoles large, conspicuous; S Xizang</td>
<td></td>
</tr>
<tr>
<td><strong>AEIKLNPTVZ</strong></td>
<td><strong>90. <em>Phlojodicarpus</em></strong></td>
</tr>
<tr>
<td>Fruit ribs thick, corky, lateral ribs broadly winged; NE China</td>
<td></td>
</tr>
<tr>
<td><strong>AEIKLNPXXZ</strong></td>
<td><strong>91. <em>Peucedanum</em></strong></td>
</tr>
<tr>
<td>Fruit lateral rib wings membranous, less than 2 × width of dorsal</td>
<td></td>
</tr>
<tr>
<td><strong>AEIKLPSXVZ</strong></td>
<td><strong>59. <em>Libanotis</em></strong></td>
</tr>
<tr>
<td>Rays and pedicels very unequal</td>
<td>36. <em>Cuminum</em></td>
</tr>
<tr>
<td><strong>AEIKLOPTVZ</strong></td>
<td><strong>55. <em>Carlesia</em></strong></td>
</tr>
<tr>
<td>• Fruit long-obl ovoid or ellipsoid, slightly dorsally compressed, ribs obtuse; Liaoning, Shandong</td>
<td></td>
</tr>
<tr>
<td>• Fruit ovoid or oblong, slightly to moderately dorsally compressed, ribs filiform or acute; N China</td>
<td>59. <em>Libanotis</em></td>
</tr>
<tr>
<td>Line</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>AEIKMNP</td>
<td>Dwarf, high altitude plants; fruit ribs all asymmetrically corky-winged</td>
</tr>
<tr>
<td>VZ</td>
<td></td>
</tr>
<tr>
<td>AEIKMNP</td>
<td>Dwarf, high altitude plants, fruit ribs all symmetrically thin-winged</td>
</tr>
<tr>
<td>VZ</td>
<td></td>
</tr>
<tr>
<td>AEIKMNPSZ</td>
<td>Medium stature plants; bracts and bracteoles large, conspicuous; fruit lateral ribs winged, dorsal ribs slender; S Xizang</td>
</tr>
<tr>
<td>AEIKMNPSXZ</td>
<td>Fruit lateral rib wings membranous, less than 2 × width of dorsal</td>
</tr>
<tr>
<td>AEIKMNPSZ</td>
<td></td>
</tr>
<tr>
<td>AEIKMNQ</td>
<td>Medium stature plants; fruit lateral ribs usually winged, dorsal ribs prominent</td>
</tr>
<tr>
<td>TVZ</td>
<td></td>
</tr>
<tr>
<td>AEIKMOP</td>
<td>Dwarf plants of high altitudes; fruit dorsally compressed, ribs all narrowly winged; W Sichuan, Xinjiang, Xizang</td>
</tr>
<tr>
<td>TVZ</td>
<td></td>
</tr>
<tr>
<td>AEIKMOPSXZ</td>
<td>Plants squamose-pubescent; fruit oblong, terete, densely scaly-villous</td>
</tr>
<tr>
<td>AEIKMOPSXZ</td>
<td></td>
</tr>
<tr>
<td>AEIKMOPSXZ</td>
<td>Rays very slender; umbellules usually 2- or 3-flowered</td>
</tr>
<tr>
<td>AEIKMOPSXZ</td>
<td></td>
</tr>
<tr>
<td>AEIKMOPSXZ</td>
<td>Rays slender; umbellules many-flowered</td>
</tr>
<tr>
<td>AEIKMOPSXZ</td>
<td></td>
</tr>
<tr>
<td>AEIKMOPSXZ</td>
<td>Water and marsh plants; fruit subglobose, ribs thick, corky</td>
</tr>
<tr>
<td>AEIKMOPSXZ</td>
<td></td>
</tr>
<tr>
<td>AEIKMOPSXZ</td>
<td>Fruit ovoid, slightly compressed, ribs narrowly winged, corky dilated at base; NE China</td>
</tr>
<tr>
<td>AEIKMOP</td>
<td>Medium stature plants; fruit lateral ribs usually winged, dorsal ribs prominent</td>
</tr>
<tr>
<td>TVZ</td>
<td></td>
</tr>
<tr>
<td>AEIKMOPTY</td>
<td>Dwarf plants of high altitudes; fruit dorsally compressed, ribs all narrowly winged; W Sichuan, Xinjiang, Xizang</td>
</tr>
<tr>
<td>TVZ</td>
<td></td>
</tr>
<tr>
<td>AEIKMOPY</td>
<td>Plants squamose-pubescent; fruit oblong, terete, densely scaly-villous</td>
</tr>
<tr>
<td>AEIKMOPY</td>
<td></td>
</tr>
<tr>
<td>AEIKMOPX</td>
<td>Fruit narrowly long-ovoid, tapering towards apex, base truncate; petals clawed, midvein yellow</td>
</tr>
<tr>
<td>AEIKMOPX</td>
<td></td>
</tr>
<tr>
<td>AEIKMOPX</td>
<td>Rays very slender; umbellules usually 2- or 3-flowered</td>
</tr>
<tr>
<td>AEIKMOPX</td>
<td></td>
</tr>
<tr>
<td>AEIKMOQ</td>
<td>Fruit ovoid, base often cordate</td>
</tr>
<tr>
<td>QCZ</td>
<td></td>
</tr>
<tr>
<td>AEIKMOQ</td>
<td>Dwarf plants of high altitudes; fruit dorsally compressed, ribs all narrowly winged; W Sichuan, Xinjiang, Xizang</td>
</tr>
<tr>
<td>QCZ</td>
<td></td>
</tr>
<tr>
<td>AEIKMOQY</td>
<td>Medium stature plants; fruit lateral ribs usually winged, dorsal ribs prominent</td>
</tr>
<tr>
<td>TVZ</td>
<td></td>
</tr>
<tr>
<td>AEIKMOQZ</td>
<td>Arid land plants; fruit densely white pubescent</td>
</tr>
<tr>
<td>VZ</td>
<td></td>
</tr>
<tr>
<td>BCFAKMP</td>
<td>Arid land plants; fruit densely white pubescent</td>
</tr>
<tr>
<td>OPTXZ</td>
<td></td>
</tr>
<tr>
<td>BCFAKMP</td>
<td>Arid land plants; fruit densely white pubescent</td>
</tr>
<tr>
<td>OPTXZ</td>
<td></td>
</tr>
<tr>
<td>BCFAKMP</td>
<td>Plants aromatic; fruit ellipsoid, slightly dorsally compressed</td>
</tr>
<tr>
<td>OPTZ</td>
<td></td>
</tr>
<tr>
<td>BCFAKMP</td>
<td>Fruit large, oblong to ellipsoid, mesocarp thick, corky, seed face involute, T-shaped; W Xinjiang</td>
</tr>
<tr>
<td>OPTZ</td>
<td></td>
</tr>
<tr>
<td>BCFAKMP</td>
<td>Rootstock a cluster of semi-woody roots with annular scars</td>
</tr>
<tr>
<td>OPTZ</td>
<td></td>
</tr>
<tr>
<td>BCFAKMP</td>
<td>Leaf segments filiform, plant anise-scented (fennel), fruits cylindric</td>
</tr>
<tr>
<td>XY</td>
<td></td>
</tr>
<tr>
<td>BCFAKMP</td>
<td>Leaf segments filiform, plant anise-scented (fennel), fruits cylindric</td>
</tr>
<tr>
<td>XY</td>
<td></td>
</tr>
<tr>
<td>BDHKMNN</td>
<td>Arid land plants; fruit densely white pubescent</td>
</tr>
<tr>
<td>RSXZ</td>
<td></td>
</tr>
<tr>
<td>BDHKMNN</td>
<td>Mesic land plants; fruit broad-ellipsoid, lateral ribs winged</td>
</tr>
<tr>
<td>RSXZ</td>
<td></td>
</tr>
<tr>
<td>BDHKMNN</td>
<td>Arid land plants; fruit densely white pubescent</td>
</tr>
<tr>
<td>RSXZ</td>
<td></td>
</tr>
<tr>
<td>BDHKMNN</td>
<td>Pets deep yellow; stylopodium base dilated</td>
</tr>
<tr>
<td>RSXZ</td>
<td></td>
</tr>
<tr>
<td>BDHKMNN</td>
<td>Pets pale yellow; stylopodium base not dilated</td>
</tr>
<tr>
<td>RSXZ</td>
<td></td>
</tr>
<tr>
<td>BDHKMNN</td>
<td></td>
</tr>
</tbody>
</table>

**天胡荽属** tian hu sui shu

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson, John F. M. Cannon

Herbs perennial. Stem slender, creeping or decumbent, rooting at the nodes. Leaves petiolate; petioles not sheathing; stipules present, entire or parted to base, membranous; blade cordate, orbicular, or reniform. Inflorescence a simple umbel; umbels sometimes densely capitata; peduncles axillary, obsolete to much longer than leaves; bracts present or absent; pedicels very short or extended (best seen in fruiting material). Flowers bisexual. Calyx teeth minute or obsolete. Petals white, greenish or yellow, valvate, ovate, spreading. Stylodium conic to depressed. Fruit globose or ellipsoid, strongly flattened laterally, base cordate, dorsal surface rounded, glabrous (rarely with white hairs); dorsal and lateral ribs usually conspicuous, slender, acute (rarely obsolete); vittae inconspicuous. Seed face plane to concave; endocarp woody. Carpophore usually absent.

About 75(–100) species: tropical and temperate regions worldwide; 14 species (five endemic) in China.

1a. Umbels several fascicled in axils and stem tip; peduncles shorter than the petioles, densely pubescent; flowers and fruit sessile or pedicellate. .......................................................................................................................... 1. *H. nepalensis*

1b. Umbels solitary in axils, sometimes several at stem tip; peduncles shorter than or exceeding the petioles, glabrous or pubescent; flowers and fruit sessile or pedicellate.

2a. Leaf blade 0.5–1.5(–2.5) × 0.8–2(–5) cm; umbels sessile or peduncle distinctly shorter than petiole. .......................................................................................................................... 2. *H. pseudoconferta*

2b. Leaf blade 1–8 × 2–11 cm; peduncle longer or about equaling the pedicel.

3a. Axillary umbels sessile, apical umbels often with peduncles to 1 cm; fruit with white hairs or glabrous ................................................................................................................................................. 3. *H. sibthorpioides*

3b. All umbels pedunculate, peduncle 0.5–3.5 cm; fruit glabrous.

4a. Petiole glabrous or distally sparsely pubescent. ................................................................................................................................................. 4. *H. calcicola*

4b. Petiole densely pubescent or hirsutulous throughout.

5a. Umbels solitary in axils, 5–18-flowered ................................................................................... 5. *H. benguetensis*

5b. Umbels 2 or 3 in axils, 2–5-flowered ................................................................................................. 6. *H. dichondroides*

6a. Petiole 3–15 cm, pubescent; leaf blade shallowly 5–7-lobed or nearly entire, lobes inconspicuously crenulate (Taiwan) .......................................................................................... 6. *H. dichondroides*

6b. Petiole 0.5–3 cm, densely hirsutulous; leaf blade shallowly 5–7-lobed or nearly entire, lobes angular in outline, with 5 to 7 deep, usually triangular lobes .......................................................................................... 7. *H. dielsiana*

7a. Umbels not densely capitata in fruit; pedicels elongate, 2.5–8 mm.

8a. Leaf blade shallowly to moderately (to near middle) 5–7-lobed.

9a. Stems, petioles and peduncles glabrous or moderately hairy with white or brown hairs; leaves angular in outline, with 5 to 7 deep, usually triangular lobes ................................................................................. 8. *H. hookeri*

9b. Stems, petioles and peduncles densely dark purple-brown hairy; leaves round in outline, with many very shallow, rounded lobes .................................................................................. 12. *H. himalaica*

8b. Leaf blade 5–7-divided, usually parted to middle or near base.

10a. Leaf blade parted to near base; segments cuneate at base ............................................................ 7. *H. dielsiana*

10b. Leaf blade parted to 1/2–3/5; lobe base as broad as the middle .................................................... 9. *H. wilsonii*

7b. Umbels densely capitata in fruit; pedicels to 2 mm.

11a. Stems, petioles and peduncles moderately to densely hairy with purple-brown hairs; leaves shallowly lobed or cleft to middle, lobes deltoid, apex acute .................................................................................. 13. *H. salwinica*

11b. Stems, petioles and peduncles essentially glabrous, occasionally hairy at nodes or near distal ends; leaves very shallowly 5–7-lobed, lobes rounded-obtuse.

12a. Petioles short, 0.8–2.5 cm; leaf blade small, 0.7–1.3 × 0.8–1.6 cm, adaxially setulose, abaxially pubescent or hispid ....................................................................................................................... 14. *H. setulosa*

12b. Petioles (1–)15–19 cm; leaf blade larger, 1.5–3.5 × 2–7 cm, glabrous on both surfaces or sparsely hirsute along veins.

13a. Leaf blade glabrous on both surfaces or abaxially sparsely hirsute on veins; pedicels equaling or slightly longer than the petioles ........................................................................................................... 10. *H. wilfordii*

13b. Leaf blade sparsely hirsute on both surfaces; pedicels 1–2 times longer than the petioles .................................................................................................................. 11. *H. ramiflora*
Hydrocotyle polycephala Wight & Arnott.

Stems robust, decumbent 5–45 cm long. Petioles 4–27 cm, distally densely pubescent; leaf blade orbicular or reniform, 2–5 × 3.5–9 cm, shallowly 5–7-lobed, thin-papery, both surfaces strigose, base cordate, palmately 7–9-nerved, lobes triangular to rounded, crenate. Umbels several to numerous, fascicled in axils and ends of stems; each umbel densely capitate, 20–60-flowered; peduncles 0.5–2 cm, shorter than petioles, puberulous; bracts ovate or obovate, minute, membranous. Pedicels very short, 0.5–1.5(–2) mm in fruit. Petals white or with purplish red stains. Stylopodium depressed; styles incurved when young, spreading in fruit. Fruit pale brown or deep purple with dark stains when mature, broadly oblate-globose, 1–1.2 × 1.5–1.8 mm. Fl. and fr. May–Nov.

Mountain slopes, shady wet grassy places, stream banks; 300–3600 m. Anhui, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Xizang, Yunnan, Zhejiang [Bhutan, NE India (Assam), Myanmar, E Nepal, Sikkim, Vietnam].

This species has reputed medicinal value. It is part of the highly variable complex of Hydrocotyle javanica Thunberg, which extends from Nepal east to Japan and south through Indonesia into Australia. The umbels fascicled at the nodes unite this group and differentiate it from other species of Hydrocotyle, but its classification is in need of revision across its whole geographic range.


密伞天胡荽 mi san tian hu sui

Stem slender and creeping, 6–30 cm long, much-branched. Petioles 2–10(–23) cm; leaf blade round-reniform, 1–2.5 × 1.5–5 cm, shallowly 5–7-lobed, papery, both surfaces puberulous, base cordate, lobes rounded, crenate. Umbels usually solitary at the nodes, sessile; umbels at stem tip often in pairs and pedunculate; each umbel with few to several flowers; pedicels obsolete or almost so. Petals pale green to white, with transparent yellow glands. Styles short, ca. 0.5 mm, erect or spreading. Fruit yellowish green, broadly-globose, 1–1.2 × 1.5–2 mm, usually covered with purplish stains or white hairs. Fl. and fr. Apr–Oct.

Forests, wet valleys, roadsides; 800–1500 m. Taiwan (Jilong), Yunnan (Menghai, Yiwu) [Myanmar].

This species has reputed medicinal value.


天胡荽 tian hu sui

Plants strongly aromatic. Stem weak, slender, filiform, creeping, diffusely branched. Petioles 0.7–9 cm, glabrous or distally pubescent; leaf blade reniform-rounded, 0.5–1.5 × 0.8–2.5 cm; membranous, variably hairy, adaxially glabrous and abaxially sparsely strigose along veins, or sometimes both surfaces glabrous or densely puberulous, base cordate, entire or shallowly 5–7-lobed, lobes rounded. Umbel solitary at the nodes, each umbel 5–8-flowered; peduncle filiform, 0.5–3.5 cm, 1–1/3 the length of the petioles; bracts ovate to ovate-lanceolate, 1–1.5 mm, membranous, with bright yellow glands; pedicels obsolete or almost so. Petals greenish white, ca. 1.2 mm, with yellow glands. Styles 0.6–1 mm, spreading. Fruit broadly globose, greenish yellow when young, covered with purplish stains when mature; intermediate ribs very prominent. Fl. and fr. Apr–Sep.
APIACEAE

1a. Leaf blade shallowly 5–7-lobed or nearly entire .......................... 3a. var. sibthorpioides

1b. Leaf blade deeply 3–5-divided, parted nearly to base, divisions obovate ...... 3b. var. batrachium

3a. Hydrocotyle sibthorpioides var. sibthorpioides

天胡荽（原变种） tian hu sui (yuan bian zhong)

Geophila yunnanensis H. Léveillé; Hydrocotyle formosana Masamune; H. keelungensis T. S. Liu et al.; H. rotundifolia Roxburgh ex de Candolle; H. tenella Buchanan-Hamilton ex D. Don.

Leaf blade shallowly 5–7-lobed or nearly entire, crenate.

Forests, wet grassy places, stream banks; 400–3000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, India, Indonesia, Japan, Korea, Nepal, Philippines, Thailand, Vietnam; tropical Africa].

This variety is the important medicinal herb “tian hu sui” of traditional Chinese medicine.


破铜钱 po tong qian


Leaf blade deeply 3–5-divided, parted nearly to base, divisions obovate, crenate.

Slopes, wet valleys, grassy places; 100–2500 m. Anhui, Fujian, Guangdong, Guangxi, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, India, Indonesia, Japan, Korea, Nepal, Thailand, Vietnam; tropical Africa].

This variety has reputed medicinal value.


石山天胡荽 shi shan tian hu sui

Stem slender, elongate and creeping. Petioles 0.7–3 cm, glabrous; stipules small, subreniform, membranous, irregularly shallowly lobed; leaf blade rounded to reniform, 0.5–1.5 × 0.7–2.5 cm, base cordate, 5–7-lobed, lobes broadly obovate, margins serrate, adaxially sparsely setulose, abaxially glabrous. Umbels 2–3 in terminal cymose inflorescences and axillary, 2–5-flowered; peduncle slender, short, 1–2 cm; bracts lanceolate, ca. 1 mm; pedicels obsolete. Petals white, ca. 0.5 mm. Styles ca. 0.2 mm. Fruit globose 1–1.3 × 0.8–1.2 mm, surface glabrous, usually covered with purplish stains. Fl. and fr. Jul–Aug.

● Shady wet grassy places in limestone areas; ca. 1500 m. S Yunnan (Xishuangbanna).

This species is recorded only from the type collection and may not be distinct from Hydrocotyle sibthorpioides.


吕宋天胡荽 li song tian hu sui

Hydrocotyle ranunculifolia Ohwi.

Stems slender, to somewhat fleshy, long, creeping, pilose. Petioles slender, 2–10(–15) cm, pubescent; leaf blade orbicular to ovate, 1–2.5 × 1–3 cm, 3(–5)-parted; segments 3-lobed, obovate, sparingly pubescent with rough white hairs. Umbels solitary at nodes, 2–13-flowered; peduncles 2–5 cm, densely pubescent; bracts 0.3–0.5 mm; pedicels 0.5–1 mm. Petals white. Styles ca. 0.5 mm. Fruit subglobose, 0.8–1.5 × 1.3–1.7 mm, glabrous. Fl. and fr. Mar–May.

Grasslands, beside slow-moving streams, roadsides; ca. 1800 m. C and N Taiwan [Japan, Korea, Philippines].

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


毛柄天胡荽 mao bing tian hu sui

Hydrocotyle sibthorpioides Lamarck var. dichondroides (Makino) M. Hiroe.

Stems slender, filiform, creeping to suberect, pilose. Petioles filiform, 0.5–3 cm, densely hirsutulous with recurved white hairs; leaf blade orbicular-reniform, 0.5–1.5 mm wide, glabrous or shortly puberulent along veins on adaxial surface, thin membranous, very shallowly crenately 5- or 7-lobed, lobes inconspicuously crenulate. Umbels solitary at nodes, 2–8-flowered; peduncles filiform, 1–3 cm, usually longer than leaves; pedicels very short, flowers almost sessile. Petals white. Fruit subglobose, ca. 1 mm wide, glabrous. Fl. and fr. Jun–Sep.

Wet walls and rocks; near sea level. N Taiwan (Taipei) [Japan].

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


裂叶天胡荽 lie ye tian hu sui

Stem slender, decumbent, 15–30 cm, sparingly branched, branches less than 6 cm, proximally sparingly pubescent or glabrous, distally densely white pubescent. Petiole 2.5–7 cm; leaf blade cordate-rounded, 2–4 × 4–8 cm, palmpate 5–7-divided, usually parted to near base; segments rhombic, ovate or obovate-lanceolate, sparsely appressed-hispid on both surfaces, dark purple, base cuneate, irregularly dentate or 3-lobed towards apex, apex acute or acuminate. Umbels 20–35-flowered; peduncles filiform, longer than petioles, densely white pubescent; bracts 1–2 mm, membranous. Petals white. Styles 0.7–11 mm, reflexed. Fruit pale purple when young, deep brown when mature, broadly cordate-globose, ca. 1.3 × 2.1 mm, glabrous. Fl. and fr. Jun–Jul.

● Wet places on mountain slopes, roadsides; ca. 1200 m. W Hubei (Badong), Sichuan.

缅甸天胡荽 mian dian tian hu sui

Stem creeping to 1.5 m, basal parts becoming thickened, distal parts erect or decumbent, laxly branched, glabrous or sparsely pubescent with purple-brown hairs. Petioles stout, 7–19 cm, glabrous or sparsely to moderately pubescent with purple-brown hairs, especially near leaf blade; leaf blade broadly round-pentagonal, rhombic-pentagonal, round-reniform or cordate-oblanceolate in outline, 3.4–8 × 4–12 cm, membranous or papery, abaxially glabrous or sparsely hispid on veins, base deeply cordate, margin shallowly to deeply 5–7-lobed, parted to irregularly doubly serrate. Umbels 30–55-flowered; peduncles slender, elongate, 6–16 cm, sparsely to moderately pubescent with purple-brown hairs, especially near umbel; bracts numerous, small; pedicels (3–)6–8 mm in fruit, glabrous. Petals white. Fruit brown-spotted, subglobose, 1–1.3 × 1.6–2 mm, base shallow; pedicels (3–)6–8 mm in fruit, glabrous. Petals white.

The name *Hydrocotyle burmanica* Kurz has been widely misapplied (e.g., in FRPS 55(1): 20. 1979) to Chinese plants that are in fact attributable to *H. hookeri*. True *H. burmanica* is a narrow endemic of S Myanmar.

1a. Leaf blade broadly round-pentagonal or rhombic-oblanceolate in outline, 5-lobed

…………………………………………………………... 8a. subsp. hookeri

1b. Leaf blade rounded in outline, 5–7-lobed.

2a. Leaf blade round-reniform, shallowly 5–7-lobed, lobes apex obtuse .... 8b. subsp. chinensis

2b. Leaf blade cordate-oblanceolate, deeply 5–7-lobed, lobes long-ovate or ovate-lanceolate

…………………………………………………………... 8c. subsp. handelii

8a. Hydrocotyle hookeri subsp. hookeri

缅甸天胡荽 (原亚种) mian dian tian hu sui (yu an ya zhong)


Leaf blade broadly round-pentagonal or rhombic-pentagonal in outline, 5-lobed.

Woods, valleys, stream banks, wet places; 900–2400 m. Guangdong, Hunan, SW Sichuan, SE Xizang, S and W Yunnan [?Vietnam].

This variety has reputed medicinal value. Records from Vietnam need confirmation.


中华天胡荽 zhong hua tian hu sui


Leaf blade round-reniform, shallowly 5–7-lobed, lobes apex obtuse; petiole and blade densely or sparsely white or purple pubescent.

- Grassy places, stream banks, shady wet roadsides; 1000–2900 m. Hunan, SW Sichuan, NW and S Yunnan [?Vietnam].

This variety has reputed medicinal value.


鄂西天胡荽 e xi tian hu sui

*Hydrocotyle handelii* H. Wolff in Handel-Mazzetti, Symb. Sin. 7: 1933; *H. burmanica* Kurz subsp. handelii (H. Wolff) C. Y. Wu & F. T. Pu.

Leaf blade cordate-oblanceolate, deeply 5–7-lobed to below the middle, lobes long-ovate or ovate-lanceolate, adaxially densely appressed-hispid, abaxially glabrous.

- Forest margins, mountain slopes, grassy places, roadsides; 2300–2500 m. SW Sichuan (Miyi), S Yunnan (Pudu He).

This variety has reputed medicinal value.


鄂西天胡荽 e xi tian hu sui

Stem erect or decumbent, thin, yellowish at base, unbranched, densely puberulous, sometimes proximally glabrous. Petiole 4–12 cm, pubescent; leaf blade round-reniform or cordate-reniform, 2–4 × 3.5–7 cm, somewhat leathery, both surfaces appressed-striagose, base deeply cordate, deeply 5–7-divided to middle or below the middle; central segment broadly ovate or obovate, shallowly 3-lobed, irregularly serrate. Umbels many-flowered; peduncles thin, longer than petioles; bracts small, membranous; pedicels 2.4–5.5 mm, glabrous, spreading. Petals covered with purplish red stains. Styles reflexed when mature. Fruit purplish red when young, becoming dark purple, subglobose, ca. 1.2 × 1.8 mm. Fl. and fr. Jul–Aug.

- Bamboo forests, moist grassy places; 1200–1800 m. W Hubei (Badong, Jianshi), Chongqing (Fengjie).


肾叶天胡荽 shen ye tian hu sui

Stem to 45 cm, creeping, branched, proximal parts rhizomatous, distal parts erect or decumbent. Petiole 3–10 cm, essentially glabrous but pubescent near leaf blade; leaf blade orbicular or reniform-rounded, 1.5–3.5 × 2–7 cm, both surfaces glabrous or abaxially sparsely hirsute on veins, base deep-cordate, margin very shallowly 7-lobed (some leaves parted to almost middle), lobes 3-crenate. Umbel many-flowered, solitary at nodes, sometimes 2–3 fascicled at tips of branches; peduncle longer than or equaling petiole; bracts small, membranous, with purplish stains. Petals white to pale yellow. Fruit light brown with purplish stains, subglobose, 1.2–1.8 × 1.5–2.1 mm. Fl. and fr. May–Sep.

Shady wet valleys, fields; 300–1400 m. Fujian, Guangdong,

长梗天胡荽 chang geng tian hu sui

*Hydrocotyle maritima* Honda; *Hydrocotyle ramiﬂora* var. *maritima* (Honda) M. Hiroe.

Stem 10–26 cm, creeping, thin and slender, distal parts decumbent. Petiole 1–15 cm; leaf blade orbicular or round-reniform, shallowly 5–7-lobed, lobes obtuse-orbicular or slightly deltoid, 0.8–2.3 × 1.6–4.5 cm, both surfaces sparsely hirsute or glabrous, base narrowly cordate with basal lobes overlapping. Umbels many-flowered, solitary at nodes; peduncle 1–2-times longer than petiole. Pedicels ca. 2 mm. Petals white with bright yellow glands. Styles incurved when young, strongly spreading when mature. Fruit purplish red when young becoming brown to dark purple, cordate-globose, 1.9 × 1.9–2.1 mm. Fl. and fr. Jun–Aug.

Woods, wet grassy places; 500–800 m. Taiwan (Taipei), Zhejiang (Tianmu Shan) [Japan; introduced in NE India, S Russia, and SW Turkey].


喜马拉雅天胡荽 xi ma la ya tian hu sui


Plants decumbent, stems, petioles and peduncles moderately to densely pubescent with dark purple-brown hairs. Stem to 50 cm. Petiole 3–18 cm; leaf blades orbicular or reniform, (0.8–)1.5–3.5(–6) × (1.2–)3–6(–8) cm, shallowly 5–7-lobed, lobes deltoid or rounded, both surfaces sparsely hirsute or covered with purplish verruciform hairs, obtusely repand-crenate, apex obtuse-rounded, principal nerves 9. Umbels many-flowered, densely capitulate in flower; peduncle 3–8 cm, usually as long as or longer than petioles; pedicels 1–2 mm in flower, 4–7 mm in fruit. Petals white with yellow or purplish red glands. Styles 0.8–1 mm, spreading. Fruit brown to purplish red, cordate-globose, 1.0–1.2 × 1.5–2 mm. Fl. and fr. Jun–Jul.

Mountain valleys, shady moist grassy places; 100–2200 m. Guizhou, Hainan, W Sichuan, E Xizang, S and W Yunnan [Bhutan, N India, Myanmar, Nepal].

The Chinese record in FRPS (55(1): 26. 1979) of *Hydrocotyle hookeri* is referable to this species.


怒江天胡荽 nu jiang tian hu sui

*Hydrocotyle salwinica* var. *obtusiloba* S. L. Liou.

Stem 50–70 cm, erect or decumbent, densely hirsute. Petioles 1–7.5 cm, stout, densely covered with dark purple-brown hairs; leaf blade reniform-orbicular, base deeply cordate, 1.5–3.5 × 2.5–6 cm, shallowly 7–9-lobed, lobes deltoid or obtuse-deltoid, both surfaces densely dark brown hirsute, finely serrate or doubly serrate; the principal nerves 7–9. Umbels many-flowered, densely capitulate in flower; peduncle 1.5–8 cm, usually longer than petioles, densely hirsute; pedicels ca. 0.5 mm in flower, 1–2 mm in fruit, forming dense capitulate fruiting umbels. Petals ovate, white or pale green, usually with purple spots. Fruit ovoid to globose, ca. 1.5 × 2 mm, deep yellow to dark purple. Fl. and fr. Jun–Aug.

● *Pinus* woods, mountain slopes, valleys, moist grassy places; 1600–3100 m. E Xizang, NW Yunnan.

The Chinese record in FRPS (55(1): 26. 1979) of *Hydrocotyle hookeri* is referable to this species.


刺毛天胡荽 ci mao tian hu sui

*Hydrocotyle laxiﬂora* Masamune (1932), not de Candolle (1830); *H. masamunei* M. Hiroe.
Stem creeping, younger branches erect, stems, petioles and peduncles retrorse villous with white or purplish hairs. Petioles 0.8–2.5 cm; leaf blade reniform to cordate, 7–13 × 8–16 mm, shallowly 7-lobed, lobes rounded, adaxially densely to moderately setulose, abaxially pubescent or hispid. Umbels many-flowered, densely capitulate, solitary at nodes; peduncles 1.8–4 cm, 1.5–2 times petioles. Pedicels very short, ca. 1 mm. Fruit cordate or globose, 1–1.5 × 1.5–1.8 mm, smooth. Fl. and fr. Apr–Nov.

● Forests, mountain slopes, grassy places, damp mossy rocks; 1500–3000 m. Taiwan.


积雪草属  ji xue cao shu
She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs perennial. Stem slender and creeping, diffuse, nodes rooting. Leaves petiolate, forming rosettes along the creeping stem; petioles sheathing at base; blade simple, entire or shallowly dentate, palmately veined. Inflorescence simple; umbels loose to subcapitate, few-flowered; peduncles axillary, usually very short; bracts 2, membranous; pedicels slender to obsolete. Calyx teeth obsolete. Petals valvate, orbicular with a narrow inflexed apex. Stylopodium obsolete; styles short, equaling filaments. Fruit reniform or globose, base cordate to truncate, strongly laterally compressed; commissure narrow, constricted; primary and secondary ribs prominent, 7–9 per mericarp, filiform, reticulate nerves evident in between; oil-bearing layer beneath the epidermis present, occasionally containing small oil tubes (cf. vittae); endocarp woody. Seed narrowly oblong in cross section, face plane. Carpophore present, entire.

Twenty species: predominately in S Africa and tropical and subtropical regions; one species in China.


积雪草  ji xue cao


Petiole 0.5–10(–30) cm; leaf blade orbicular or reniform, 1–4.5 × 1.5–5 cm, palmate veins 5–7, prominent, both surfaces glabrous or abaxially sparsely pubescent on the veins, base broadly cordate, coarsely toothed. Peduncles 2–4, clustered axillary, 0.2–1.5 cm; bracts 2 (rarely 3), ovate, 3–4 × 2.1–3 mm, persistent in fruit; umbels 3–4-flowered, capitulate. Flowers sessile or subsessile. Petals white or rose-tinged. Fruit 2.1–3 × 2.2–3.6 mm. Fl. and fr. Apr–Oct.

Shady, wet, grassy places, river margins; 200–1900 m. Anhui, Fujian, Guangdong, Guangxi, Hunan, S Jiangsu, Jiangxi, S Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [widespread throughout tropical and subtropical countries worldwide, Bhutan, India, Indonesia, Japan, Korea, Laos, Malaysia, Myanmar, Nepal, Pakistan, Thailand, Vietnam].

This species is similar in appearance to, and is sometimes mistaken for, *Dichondra micrantha* Urban (Convolvulaceae). It is sometimes eaten, and is an important herb ("ji xue cao") of traditional Chinese medicine.


马蹄芹属  ma ti qin shu
She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

*Cotylonia* C. Norman.

Herbs annual or biennial, glabrous. Rootstock short and thick, roots fibrous, fasciculate. Stem erect, smooth, unbranched, leafless. Leaves long-petiolate; petiole expanded at base into short sheath; blade orbicular or reniform. Inflorescence terminal; umbels simple; bracts 2, foliaceous. Calyx teeth minute or obsolete. Petals ovate, flat, apex obtuse. Stylopodium conic; styles very short. Fruit rectangular-cubic, flattened dorsally; dorsal rib filiform, prominent, intermediate ribs obscure, lateral ribs winged; vittae obscure. Seed face plane. Carpophore shortly bifid at the apex, persistent.

● One species.


马蹄芹  ma ti qin

*Cotylonia bracteata* C. Norman.

Herbs slender, 20–55 cm high. Basal leaves several; petiole 6–30 cm; blade rounded to reniform, 2–8 × 5–12 cm, nerves 7–11 palmate, base deeply cordate, margin irregularly crenate, usually setose-apiculate, apex slightly notched. Peduncles 3–6, 1.5–3.5 cm, terminal, subtended by 2 opposite, foliaceous bracts; bracts rounded or reniform, 2.4 × 5–6.5 cm, sessile; bracteoles several, linear; umbels 9–40-flowered. Petals white to greenish white, 1.2–1.4 × 1–1.1 mm. Styles short, ca. 0.3 mm, recurved. Fruit 3–3.5 × 2.2–2.8 mm. Fl. and fr. Apr–Oct.
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. Stylepodium absent or discoid-flat; styles shorter than or exceeding the calyx teeth, recurved. Fruit long-ellipsoid or subglobose, densely covered with uncinate 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 spines .... 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 uncinate 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. astrantifolia
         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. giralddii
   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, subcramose ................................................................. 17. S. oviformis
      10b. Leaf blade palmately 3–5-parted, segments usually 2–3-lobed.
         12a. Inflorescence subcramose; lateral umbels without peduncles, in fascicles ......................... 7. S. caerulescens
         12b. Inflorescence paniculate or subcymose; lateral umbels with distinct peduncles.
            13a. Leaves small, less than 2 × 3 cm; fruit furrows smooth, ribs bearing spinulose crests .............. 8. S. petagniioides
            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


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-ovaricular, 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 broadly 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, sub-sessile; 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, uniciliate 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.


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 round-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 ovate, 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 the teeth, recurved. Fruit ovoid-globose, ca. 4.5 × 4 mm, covered with tubercles and straight or slightly curved spines; vittae 5. Fl. May.

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


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 subtruncate, 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, 2.5–2.5 × 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.


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 × 5–9 cm, palmately 3-parted, primary segments shallowly 2–3-lobed, sharply serrate; central segment obovate, 3.5–5.5 × 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.

● Forests, mountain slopes, grassy 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 Tiantai Shan, Tiantai Shan).


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).


锯齿变豆菜 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-ovate, 1.5–3 × 1–2.5 cm, base attenuate, apex shallowly 3-lobed, margin irregularly sharply serrate. Cauclidean 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 uncinate bristles, bristles pale yellow, ca. 1.2 × 1 mm, recurved. Fl. and fr. May, fr. Jun–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.


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-ovaricular or cordate-pentagonal, 1–2 × 2–3 cm, palmately 3–5-parted or foliolate; central segment broadly obovate or rhombic-ovaricular, short-petiolate, apex shallowly 3-lobed, sharply serrate, teeth mucronate to spinulose; lateral segments parted to base, trilobulate or entire, base cuneate. Cauclidean 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.


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 subrounded, round-cordate or pentagonal, 4–22 cm, palmately 3–5-parted, margin sharply irregular-serrate; central segment cuneate-ovate or ovate, 1.5–7 × 1.2–4.5 cm; lateral segments parted nearly to base, base cuneate. Cauclidean 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. Stamine 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).


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; microparic 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.
10. Sanicula orthacantha (S. Moore, J. Bot. 13: 227. 1875.)

**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-ovate or rhombic-cuneate, 2–7 × 1–4 cm; lateral segments oblique-ovate, 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; fruit ribs and furrows. Roots fibrous, without rhizome. Inflorescence elongate, loose and spreading; 6 or 7 flowers per umbel. Fruit erose-spinose on the ribs, tuberculate in the furrows.

- Forests, mountain summits; 2300–2500 m. SC Sichuan (Emei Shan).
- This variety has reputed medicinal value.


**zhou jing e jiao ban**

Rhizome long, with distinct nodes.

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


**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 umbel, pedicels ca. 2 mm; petals white, obovate, apex inflexed. Fertile flowers 2 or 3 per umbel, sessile; calyx teeth narrowly lanceolate, ca. 1 mm; styles longer than the petals, recurved. Fruit ellipsoid, ca. 1.5 × 1 mm, densely covered with uncinate bristles when mature; vitte obscure. Fl. and fr. Jun.

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


**chuan dian bian dou cai**

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, 1.5 × 0.5–1 mm, midrib distinct; umbellules ca. 10-flowered. Staminate flowers 6–8 per umbel, pedicels short; petals greenish white or pinkish. Fertile flowers 2 or 3 per umbel,
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 unicinate bristles, bristles yellow 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.


软雀花 ruan que hua

Sanicula europaea Linnaeus subsp. etala (Buchanan-Hamilton ex D. Don) H. de Boissieu; S. hermaphroditica 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 obovate-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, linear; umbellules 4–8-flowered. Staminate flowers 1–4 per umbellule; pedicels 1–1.5 mm; petals white, obovate. Fertile flowers 3 or 4 per umbellule; calyx teeth shorter, ca. 0.5 × 0.3 mm; style nearly equaling calyx teeth. Fruit ovoid-globose, 2.5–3 × 2.5–3 mm, densely covered with uncinate bristles; vittae 5, small, commissural vittae 2, larger. 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.


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, 1.2 × 0.5–0.7 mm; umbellules 6–7-flowered. Stamine 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 broadly ovoid, 2.5–2 × 2.5–3 mm, densely covered with yellow or purplish red uncinate bristles; vittae obscure. Fl. and fr. May–Oct.

- 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.

15b. Sanicula giraldii var. giraldii

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

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

- 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.


卵萼变豆菜 iuan 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.

1a. Stem green; flowers white or pale yellow; heads cylindrical ................................................................. 1. *E. foetidum*

1b. Stem gray-white or pale purple; flower pale blue; heads ovoid to subglobose ................................................. 2. *E. planum*


*刺芹* *ci qin*

Plants 8–40 cm high from a basal rosette. Taproot fusiform or stout. Stem erect. Basal leaves numerous; petioles short or obsolete, sheath up to 3 cm; blade lanceolate or oblanceolate, entire, 5–25 × 1.2–4 cm, venation pinnately reticulate, base cuneate to decurrent, apex obtuse, margin coarsely toothed. Inflorescence diverse, unbranched or branched. Heads numerous, subtended by a involucre consisting of bracts and bracteoles. Fruit ovoid to subglobose, covered with tubercles.

The leaves are used as a flavoring (similar to *Coriandrum sativum*), and the species has reputed medicinal value.


*扁叶刺芹* *bian ye ci qin*

Plants 70–100 cm high. Taproot stout, woody; crown clothed with fibrous residues of leaf sheaths. Stem gray-white to purple. Basal leaves several; petiole 6–13 cm; blade narrowly elliptic-ovate, 5–8.5 × 2.5–5 cm, palmately 7–9-nerved, prominent on both surfaces, base cordate, margin coarsely toothed, teeth mucronate to short spinulose. Upper leaves sessile, shallowly to deeply 3–5-parted, lobes lanceolate, margin 1–4-spinu-
Sphallerocarpus Linnaeus, Sp. Pl. 1: 258. 1753.

Herbs annual to perennial. Root fusiform or tuberous. Stem erect, branched, retrorsely hispid with white or grayish hairs (Chinese species). Leaves petiolate; petiole sheathing; blade 2-pinnate to pinnately decompound. Umbels compound, terminal and lateral; bracts usually absent (Chinese species); bracteoles 2–6. Calyx teeth obsolete. Petals white, pale yellow or pale blue-purple, obovate-orbicular, with incurved apex. Styles shorter than stylodium. Fruit linear-oblong, flattened laterally, commissural surface narrow, glabrous; ribs 5, obtuse, sometimes inconspicuous; mericarps subterete in cross section; vitiae 1 in each furrow, 2 on commissure. Seed face concave or with a broad, shallow sulcus. Carpophore entire or bifid at the apex.

About 40 species: Europe, North America; two species in China.

1a. Plants annual; root fusiform; ultimate segments of leaves ovate; rays less than 5

1b. Plants perennial; root tuberous; ultimate segments of leaves linear; rays more than 7

2. Chaerophyllum prescottii de Candolle, Prodr. 4: 225. 1830.

Herbs perennial. Stem terete, much branched, pubescent (especially around nodes). Leaves 2–3-pinnate, very finely divided. Umbels compound, terminal and lateral; bracts absent; rays numerous; bracteoles several, ovate-lanceolate, margin scariosus. Flowers of the terminal umbels almost wholly bisexual, staminate flowers sometimes present in lateral umbels, outer petals of outer umbels often radiant. Calyx teeth minute, subulate or obsolete. Petals obovate. Stylodium conic or depressed, entire or undulate; styles short, erect or recurved. Fruit ellipsoid-oblong, slightly flattened laterally, constricted at commissure; ribs 5, prominent, undulate; vitiae 2–3 in each furrow, 4–6 on commissure. Seed face broadly sulcate. Carpophore bifid, cleft to near base.

One species: China, Japan, Mongolia, Russia (E Siberia).


Ruderal of disturbed habitats; 500–1500 m. Xinjiang (Altay, Kukesu, Tacheng) [Kashmir, Russia (W Siberia); C and SW Asia, C and S Europe].
Plants 50–120 cm high. Root tuberous or conic. Stem somewhat white pubescent towards base, nearly glabrous above. Basal leaves caducous. Cauline leaves petiolate; petioles 1–7 cm, sheaths brown, margin scarios, white pubescent; ultimate segments ovate-lanceolate, 5–10 × 3–5 mm, 3-lobed or toothed. Rays 6–13, 2–4 cm, unequal; bracteoles 5, long-ovate to broad-lanceolate, 1.5–2.5 × 1–2 mm, pubescent, margin scarios, often reflexed; umbellules 15–25-flowered. Pedicels 2–6 mm, unequal. Petals ca. 1.2 × 1 mm. Fruit 4–7 × 1.5–2 mm. Fl. and fr. Jul–Oct.

Mountain slopes, arable lands, waste places; 500–2800 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Qinghai, Shanxi, NW Sichuan, Xinjiang [Japan, Mongolia, Russia (E Siberia)].

This species has reputed medicinal value (in Qinghai).


峨参属 e shen shu

She Menglan (佘孟兰 Sheh Meng-lan); John F. M. Cannon, Mark F. Watson

Cerefolium Fabricius, nom. rej.

Herbs, biennial or perennial. Taproot slender or thickened. Stem erect, branching and fistulose. Leaf blade 2–3-ternate-pinnate or pinnately decompound; ultimate segments dentate or pinnatifid. Umbels loosely compound, terminal and lateral; bracts absent; rays few, spreading; bracteoles several, margin ciliate, reflexed; pedicels spreading. Flowers polygamous. Calyx teeth obsolete. Petals white or yellowish green, oblong or cuneate with a narrow inflexed apex; outer occasionally enlarged (radiant). Stylopodium conic; styles short. Fruit long-ovoid to linear, apex attenuate into a beak, flattened laterally and often constricted at the commissure, smooth or bristly; ribs obsolete; vitiae obscure to obsolete. Seed subterete in cross section, face deeply sulcate.

About 15 species: temperate Asia, Europe; one European species introduced in North America; one species in China.


峨参 e shen

Plants 0.6–1.5 m high. Stem stout, glabrous or lower parts finely pubescent. Basal leaves long-petiolate; petiole 10–30 cm, sheaths ca. 4 × 1 cm; blade ovate in outline, 10–30 cm; primary pinnae long-petiolulate, ovate to elliptic-ovate, 4–12 × 2–8 cm; ultimate segments ovate or elliptic-ovate, 1–3 × 0.5–1.5 cm, serrate or toothed, abaxially sparsely pubescent. Upper cauline leaves subsessile. Umbels 2.5–8 cm wide; rays 4–15, unequal; bracteoles 5–8, ovate to lanceolate, acuminate, shorter than pedicels, pedicel apex usually surrounded by white bristles in fruit. Styles ca. 2 × as long as stylopodium. Fruit 5–10 × 1–1.5 mm. Fl. and fr. Apr–May.

Forests, valley sides, grassy places on mountain slopes; near sea level to 4500 m. Anhui, Gansu, Hebei, Henan, Hubei, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Sichuan, Xinjiang, Xizang, Yunnan [N India, Japan, Kashmir, Korea, Nepal, Pakistan, Russia; E Europe; introduced in North America].

The roots of both varieties have reputed medicinal value in some provinces.

1a. Fruit glabrous or rarely sparsely covered with fine granules .......................... 1a. subsp. sylvestris

1b. Fruit densely covered with warty hairs or bristles .................................... 1b. subsp. nemorosa

1a. Anthriscus sylvestris subsp. sylvestris


香根芹属 xiang gen qin shu

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Uraspermum Nuttall, nom. rej.

Herbs perennial. Stem erect or decumbent at base, branched, glabrous or pubescent. Petiole sheath narrow, scarios; leaf blade triangular-ovate in outline, 2–3-ternate-pinnate (Chinese species); segments serrate to pinnatifid. Umbels loosely compound; pedun-
cles terminal and lateral, usually exceeding the leaves; bracts few or absent; rays few, slender, unequal, spreading and spreading in fruit; bracteoles several or occasionally absent, reflexed. Calyx teeth obsolete. Petals white, purple or greenish yellow, spathulate to obovate with a narrow inflexed apex. Stylodium conic; styles slender, sometimes minute. Fruit (Chinese species) narrowly clavate, fruit; bracteoles several or occasionally absent, reflexed. Calyx teeth obsolete. Petals white, purple or greenish yellow, spatulate to ovate-lanceolate, 2–5 cm, lengthening in fruit to 10 cm; bracteoles 4–5, 2–5 cm, lengthening in fruit to 10 cm; bracteoles 4–5, lanceolate to ovate-lanceolate, 2–5 × 1–1.5 mm, abaxially pubescent and on margin, usually reflexed. Fertile flowers 1–6 in each umbellule. Petals obovate, 1.2 × 1.5 mm, abaxially pubescent and on margin, usually reflexed. Ovary white pubescent. Fruit 1–2.2 × 0.2–0.25 cm, base caudate; ribs sparsely bristly, densely towards the base. Fl. and fr. May–Jul.

Forests, grassy places in valleys and on stream banks; 200–3500 m. Widely distributed in China [Bhutan, N India, Japan, Kashmir, Korea, Mongolia, Nepal, Pakistan, Russia (Siberia); North America].

A broad range of morphological variation can be seen within this species. Taxonomic treatments vary, with some authors recognizing several distinct taxa, whereas others consider this as continuous variation within one undivided species.


香根芹 xiāng gèn qín (原变种)

Plants 25–70 cm high. Taproot aromatic. Stem green or purplish tinged. Basal leaves petiolate; petiole 5–26 cm; blade to 29 × 25 cm; pinnate 2–4 pairs, ultimate segments ovate to ovate-lanceolate, (0.5–)1–6(–9) × (0.2–)0.5–5(–8) cm, both surfaces hispid or pilose with white hairs, hairs sometimes restricted to veins. Peduncles 4–22 cm; bracts 1–4, subulate to linear, 0.5–1.2 cm, caducous; rays 3–5, 2–5 cm, lengthening in fruit to 10 cm; bracteoles 4–5, lanceolate to ovate-lanceolate, 2–5 × 1–1.5 mm, abaxially pubescent and on margin, usually reflexed. Fertile flowers 1–6 in each umbellule. Petals obovate, ca. 1.2 × 1 mm. Styles slightly longer than the stylodium. Ovary white pubescent. Fruit 1–2.2 × 0.2–0.25 cm, base caudate; ribs sparsely bristly, densely towards the base. Fl. and fr. May–Jul.

Forests, grassy places in valleys and on stream banks; 200–3500 m. Widely distributed in China [Bhutan, N India, Japan, Kashmir, Korea, Mongolia, Nepal, Pakistan, Russia (Siberia); North America].

A broad range of morphological variation can be seen within this species. Taxonomic treatments vary, with some authors recognizing several distinct taxa, whereas others consider this as continuous variation within one undivided species.

1a. Leaf segments ovate-oblong, the basal pair undivided usually deeply dentate .......... 1a. var. aristata

1b. Leaf segments broadly ovate to broadly oblong-ovate, the basal pair 2-lobed or deeply 2–3-parted, usually irregularly coarsely toothed .................................................. 1b. var. laxa

1. Osmorhiza aristata var. aristata

香根芹 (原变种) xiāng gèn qín (yuán biàn zhòng)

Chaerophyllum aristatum Thunberg in Murray, Syst. Veg., ed. 14, 288. 1784; Chaerophyllum claytonii (Michaux) Persoon; Myrhris aristata (Thunberg) Sprengel; M. claytonii Michaux; Osmorhiza amurensis F. Schmidt ex Maximowicz; O. aristata var. montana Makino; O. claytonii (Michaux) C. B. Clarke; O. japonica Siebold & Zuccarini; Scandix aristata (Thunberg) Makino; S. claytonii (Michaux) Koso-Poljanski; Uraspermum aristatum (Thunberg) Kuntze; Washingtonia claytonii (Michaux) Britton.

Leaf segments ovate-oblong, acute or obtuse, the basal pair undivided, usually deep-dentate.

Forests on mountain slopes, grassy places on stream banks; 200–1200 m. Widely distributed from NE to S China; also in S Gansu and S Shaanxi [Japan, Korea, Mongolia, Russia (Siberia); North America].


疏叶香根芹 shū yè xiāng gèn qín


Leaf segments broad-ovate or broadly long-ovate, acuminate, the basal pair bilobed or 2–3-parted, usually irregularly coarsely toothed.

Forests, grassy places in valleys; 1600–3500 m. S Gansu, Gulizhou, S Shaanxi, S Xizang, NW Yunnan [Bhutan, N India, Kashmir, Nepal, Pakistan].

The roots are used medicinally.


块茎芹属 kuài jīng qín shù

Pan Zehui (潘泽惠); Mark F. Watson

Herbs perennial. Tuber globose. Stem ribbed, simple or branched, softly pilose, tapering below soil level and easily broken from the tuber. Leaves 2–4-ternate-pinnate/pinnatisect. Bracts absent or caducous; rays conspicuously unequal; bracteoles 5. Calyx teeth obsolete. Petals obovate, notched with inflexed apex, outer petals slightly enlarged (radiate). Stylodium short-conic; styles recurved, 3 times as long as stylodium, caducous. Fruit ovoid-oblong, slightly flattened laterally, smooth, apex constricted; ribs prominent, protruding; vittae 1 per broad furrow, 2 on commissure. Seed slightly laterally flattened, face deeply sulcate.

One species: China, Kazakhstan.


块茎芹 kuài jīng qín


Plants 40–100 cm high. Tuber ca. 2 cm wide. Basal and lower leaves long-petiolate with a small, narrow sheath; blade broadly rhombic-ovate in outline, to 8 × 5 cm; primary pinnate 4–5 pairs, long-petiolulate; ultimate segments linear-oblong, 3–
10 × 0.5–2 mm, entire. Middle and upper leaves gradually reduced with petioles wholly sheathing. Umbels 3–4 cm wide; bracts 1 or 2, or absent; rays 5–8; bracteoles 5, lanceolate or ovate-lanceolate, reflexed in fruit. Pedicels numerous, ca. 5 mm. Petals white, up to 5 mm (the outer petals radiating). Fruit dark brown, ovoid-oblong, 3–5 × 1.5–1.8 mm. Fl. Apr–May, fr. May–Jun.

Shrubby thickets, grassy or gravelly slopes; ca. 2000 m. W Xinjiang [Kazakhstan].

Recent evidence from molecular studies suggests that Krasnovia longiloba should be included within the traditionally monotypic genus Kozlovia Lipsky.


窃衣属 qie yi shu

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs annual or sometimes perennial, bristly, hispid or appressed pubescent throughout. Stem erect, much branched, ridged, leafy throughout. Leaf blade 1–2-pinnate or pinnately decompound; ultimate segments lanceolate to oblanceolate, densely toothed to deeply lobed, both surfaces strigose with appressed hairs. Umbels loosely compound or capitately terminal and/or lateral; bracts few or absent; rays 2–12, spreading-ascending, or umbellules sessile; bracteoles 2–8, linear or subulate. Calyx teeth small, triangular to acute-lanceolate. Petals white or purplish red, obovate, with a narrow inflexed apex, appressed-strigose on abaxial surface. Stylopodium thick, conic; styles short. Fruit round-ovoid or oblanceolate, flattened laterally; primary ribs filiform, setulose, lateral ribs displaced onto the commissural surface; secondary ribs hidden by dense, upwardly hooked spines (Chinese taxa) which occupy the entire interval; vittae 1 under the secondary ribs, 2 on commissure. Seed flattened dorsally in cross section, face concave. Carpophore bifid at apex, cleft for 1/3–1/2 of its length.

About 20 species: Africa, Asia, Europe, North and South America, Pacific Islands (New Zealand); two species in China.

“Torilis taihsenanensis” (Masumune, J. S. Trop. Agric. 6: 570. 1934) was described from Taiwan, but the apparent assignment to Torilis was a typographic error for Trollius (Ranunculaceae), as was indicated on an errata slip inserted between pages 4 and 5 of the volume. The correct name is Trollius taihsenanensis Masumune (see Fl. China 6: 141. 2001).

1a. Bracts 3–6; rays 4–12; fruit round-ovoid, 1.5–4 × 1.5–2.5 mm .......................................................................................... 1. T. japonica

1b. Bracts usually absent, rarely 1; rays 2–4(–5); fruit oblanceolate, 4–7 × 2–3 mm ........................................................................ 2. T. scabra

1. Torilis japonica (Houttuy) de Candolle, Prodr. 4: 219. 1830.

小窃衣 xiao qie yi

Caucalis japonica Houttuy, Nat. Hist. 2(8): 42. 1777; Anthriscus vulgaris Bernhardi; C. anthriscus (Linnaeus) Hudson; C. conifolia Wallich ex de Candolle; C. elata D. Don; C. praetermissa (Hance) Franchet; Tordylium anthriscus Linnaeus; Torilis anthriscus (Linnaeus) C. C. Gmelin (1805), not (Linnaeus) Gaertner (1788); T. anthriscus var. japonica (Houttuy) H. de Boissieu; T. praetermissa (Hance) Franchet.

Herbs 20–120 cm tall. Basal and lower cauline leaves petiole; petiole 2–7 cm; blade triangular-ovate to ovate-lanceolate in outline, up to 20 × 17 cm; pinnae ovate-lanceolate, 2–6 × 1–2.5 cm. Peduncles 3–25 cm, retrorse hispid; bracts few, linear; rays 4–12, 1–3 cm spreading, bristly; bracteoles 5–8, linear or subulate, 1.5–7 × 0.5–1.5 mm; umbellules 4–12-flowered. Pedicels 1–4 mm, shorter than bracteoles. Calyx teeth small, deltoid-lanceolate. Fruit often blackish purple when mature, globose-ovoid, 1.5–5 × 1–2.5 mm. Fl. and fr. Apr–Oct.

Mixed forests in valleys, grassy places, especially in disturbed areas; 100–3800 m. Throughout China, except Heilongjiang, Nei Mongol, and Xinjiang [widespread as a ruderal in Asia and Europe].

The roots and fruits are used medicinally in some provinces.

2. Torilis scabra (Thunberg) de Candolle, Prodr. 4: 219. 1830.

窃衣 qie yi

Chaerophyllum scabrum Thunberg in Murray, Syst. Veg., ed. 14, 149. 1784; Anthriscus scabra (Thunberg) Kosol-Poliansky; Caucalis scabra (Thunberg) Makino; Torilis henryi C. Norman.

Herbs to 90 cm tall. Basal and lower cauline leaves petiolate; petiole 2–6 cm; blade ovate in outline, up to 15 × 18 cm; pinnae lanceolate to narrowly ovate, 2–15 × 2–8 cm. Peduncles 3–10 cm; bracts usually absent; rays 2–4(–5), 1–5 cm, stout and ridged, densely appressed-strigose; bracteoles 2–6, subulate, equal to or shorter than the pedicels; umbellules 2–6-flowered. Pedicels 3–8 mm, hirsute. Fruit usually dark green, occasionally tinged dark purple, oblong, 4–7 × 2–3 mm. Fl. and fr. Apr–Nov.

Mixed forests on mountain slopes or in valleys, roadsides, especially in disturbed areas; 200–2400 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan [Japan, Korea; introduced in North America].

This species has reputed medicinal value.


刺果芹属 ci guo qin shu

Pan Zehui (潘泽惠); Mark F. Watson

Herbs annual, all parts densely pubescent, gray-white hirsute. Tap root slender. Stem thinly ribbed, branched. Leaves pinnate (rarely 2-pinnate/pinnatifid); petioles with narrow membranous sheath; pinnae narrowly oblong, coarsely dentate, sessile, the terminal decurrent at base. Umbels terminal and lateral; rays few, lax; bracts and bracteoles present. Flowers polygamous; outer flowers...
of umbellules bisexual, inner staminate. Calyx teeth subulate-lanceolate, prominent. Petals purple-red to pinkish white, obovate, the outer enlarged (radiant) obreniform, apex notched, with narrow inflexed lobe. Stylopodium conic; styles short. Fruit ovoid, flattened laterally, densely covered with prickles or bristles; primary and secondary ribs evident, primary ribs bearing 3 rows of bristles, the secondary ribs 1 row of bristles; vittae 1 in each furrow (under each secondary rib) and often 2 under each primary rib, 2 on commissure. Seed face involute with deeply incurved lateral margins. Carpophore bifid at apex.

One species: NW Africa, C and SW Asia, C, S, and W Europe.


刺果芹 *ci guo qin*


Plants 20–40(–50) cm high. Leaf petiole to 5 cm; blade ovate-oblong, 4–10 × 2.5–5 cm; pinnae 1–2.5 × 0.5–1 cm.

Peduncles stout, 6–9 cm; bracts (3–)4–5, lanceolate, 5–12 mm, margin white-scarious; rays 2–5, 3–4 cm; bracteoles ca. 5, ovate, 5–8 mm, margin white-scarious. Umbellules comprise 3–4 bisexual and 3–4 staminate flowers. Fruit ca. 10 × 5 mm. Fl. Jul, fr. Aug.

Ruderal weed of roadsides, waste places, and ditches; ca. 2000 m. W Xinjiang [Afghanistan, Kashmir, Kazakhstan, Pakistan, Russia; NW Africa, C and SW Asia, C, S, and W Europe].


滇藏细叶芹属 *dian zang xi ye qin shu*

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs annual. Taproot slender. Stem erect, slender, sparingly branched. Leaves long-petiolate; petiole with oblong sheathing base; leaf blade 3–4-pinnate/pinnatifid, thin, papery. Upper stem leaves small, petioles wholly sheathing. Umbels compound, terminal and lateral; bracts absent or rarely 1; rays numerous, subequal, spreading; bracteoles several, narrow, shorter than flowers. Flowers bisexual. Calyx teeth lanceolate, prominent, persistent. Petals oblong-obovate, pinkish white, abaxially pubescent, apex inflexed. Stylopodium widely low-conic; styles very short, deciduous. Fruit small, narrowly oblong, terete, glabrous; ribs equal, filiform, prominent; vittae 1–2 in each furrow, 2 on commissure. Carpophore bifid at apex.

● One species.


滇藏细叶芹 *dian zang xi ye qin*

Plants to 50 cm high. Leaf blade ovate-oblong in outline, ca. 10 × 6 cm; pinnae 5–6 pairs; ultimate segments ovate, 4.5–5 mm × 3–4 mm, adaxially sparsely squamose-pubescent. Peduncles squamose-pubescent; umbels 5–6 cm wide; rays 18–20, 2–4 cm, slender, angled, squamose-pubescent; bracteoles several, linear-lanceolate; umbellules more than 10-flowered; pedicels densely scaly-villous. Calyx teeth lanceolate, longer than stylopodium. Fruit oblong, terete; mericarps pentagonal in cross section; ribs acute, equal. Fl. Aug–Sep, fr. Sep–Oct.

● Among shrubs and in grassy areas in alpine valleys; 3600–3800 m. SE Xizang (Zayü), Yunnan (Binchuan).

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


针果芹属 *zhen guo qin shu*

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

*Scandicum* (K. Koch) Thellung.

Herbs annual. Stem slender, erect, branching above, shortly pubescent. Leaves petiolate; petioles narrowly sheathing for most of their length (especially in upper leaves) blade (1–)2–3-pinnate, ultimate segments narrowly linear (Chinese species). Umbels compound, terminal and lateral; bracts absent (or 1); rays few, sometimes reduced to one; bracteoles several, lobed or dissected. Calyx teeth obsolete. Petals white, oblong, with a narrow incurved apex, sometimes unequal (radiate) in the outer flowers. Stylopodium flattened; styles erect, small. Fruit sub-cylindrical, slightly compressed laterally, erect; beak up to four times as long as the seed-bearing part; ribs slender, prominent; vittae very small. Seed face involute with deeply incurved lateral margins. Carpophore deeply bifid at apex.

About 20 species: Asia, Mediterranean region; one species in China.


针果芹 *zhen guo qin*

*Scandix pinnatifida* Ventenat; *Scandium stellatum* (Banks & Solander) Thellung.

Plants 10–30 cm high. Leaf blade ovate, to 6 × 3 cm; ultimate segments 2–11 × ca. 0.5 mm. Rays 1–3, short, 3–8 mm; bracteoles conspicuously pinnate, 4–10 mm. Flowers subses-sile, 5–14 per umbellule. Fruit 16–28 mm; beak long, 1.5–3 times as long as the seed-bearing part; seed-bearing part covered with coarse white bristles.
Grassy slopes, waste places, roadsides; ca. 2000 m. Xinjiang (Tian Shan) [widespread in C and SW Asia and the Mediterranean region].


芫荽属 yan sui shu

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs annual, strongly aromatic, glabrous throughout. Taproot slender. Stem erect, branched above. Leaves petiolate; blade pinnately dissected, membranous; ultimate segments very variable in shape. Umbels compound, lax, terminal or opposite the leaves; bracts absent (rarely 1); rays several, spreading, unequal; bracteoles several, linear. Calyx teeth short, acute, often unequal. Petals white or rose-pink, obovate, apex deeply notched, outer petals enlarged (radiant). Stylodium conic; styles slender, erect. Fruit globose, not readily separating at maturity; pericarp hard; primary and secondary ribs filiform, evident; vittae absent or solitary, obscure in mature fruits. Seed face concave. Carpophore deeply bifid at apex.

Probably one species: Mediterranean region; cultivated in China.


芫荽 yan sui

Selinum coriandrum E. H. L. Krause, nom. illeg. superfl.

Plants to 60 cm high. Basal and lower leaves pinnate to 2-pinnatisect; petiole to 13 cm, shortly sheathing at base; blade ovate, to 14 × 8 cm; pinnae broadly ovate or flabelliform, 1–2 × 1–1.5 cm, variously toothed or incised; ultimate segments broad. Mid and upper cauline leaves ternate-2–3-pinnatisect, reducing up the stem; ultimate segments linear to filiform, 2–15 × 0.5–1.5 mm, obtuse, entire. Peduncles 2–10 cm; rays 2–8, 1–2.5 cm; bracteoles 2–5, linear, entire; umbellules 3–9-flowered. Pedicels 2–5 mm. Calyx teeth ovate-deltoid or ovate-lanceolate, unequal. Fruit 1.5–5 mm wide. Fl. and fr. Apr–Nov.

Cultivated and sometimes naturalized. Almost throughout China [native to the Mediterranean region; cultivated worldwide].

The stem and leaves are used as a vegetable or culinary herb (coriander, cilantro); the fruit are used as a culinary spice, for oil, and as a dietary herb in traditional Chinese medicine (“hu sui”).


双球芹属 shuang qiu qin shu

Pan Zehui (潘泽惠); Mark F. Watson

Herbs perennial. Taproot woody, crown surrounded by fibrous remnant sheaths. Stem ribbed, lower branches alternate, the upper opposite, whorled or cymose. Leaves 2–4-pinnate-pinnatisect; petioles wholly sheathing. Umbels compound, terminal or lateral; bracts small, deciduous; bracteoles several. Flowers polygamous. Calyx teeth conspicuous, subulate-lanceolate, persistent. Petals white, oblong to ovate, base clawlike, apex notched and slightly incurved. Stylodium low-conic; styles reflexed. Fruit bigbose (didymous), broader than long, glabrous, not separating at maturity; pericarp leathery; ribs inconspicuous (Chinese species); vittae obscure. Seed face concave. Carpophore fused to mericarps.

About seven species: C Asia, Europe; one species in China.


双球芹 shuang qiu qin

Cachrys vaginata Ledebour, Fl. Altaic. 1: 366. 1829.

Plants 20–50 cm high. Basal leaves short petiolate, petiole 0.5–1.5 cm, upper leaves sessile; blade ultimate segments of blade oblong to linear, 2–15 × 1–2 mm. Umbels 5–10 cm wide; bracts several, narrowly lanceolate, ca. 5 mm; rays 8–16, 1–5 cm, unequal; bracteoles 8–10, linear-lanceolate, 1–4 mm, margin scarious; umbellules with 6–14 bisexual flowers and several staminate flowers; pedicels unequal, the peripheral ca. 1 cm, the internal almost obsolete. Calyx teeth ca. 0.5 mm. Fruit with many brownish longitudinal stripes, 2–3 × 2.4–4 mm. Fl. May, fr. Jun.

Dry stony slopes; ca. 2000 m. Xinjiang [Kazakhstan].

17. OREOMYRRHIS Endlicher, Gen. Pl. 787. 1839.

山茉莉芹属 shan mo li qin shu

Pan Zehui (潘泽惠); Mark F. Watson


Herbs perennial and caespitose. Stem inconspicuous or very short, branching from base. Leaves all basal; petiole with membranous sheath at base; blade oblong to ovate, 1–2-pinnate; ultimate segments linear-lanceolate, minute. Umbels simple, 4–20-flowered; peduncles long, scapellake; bracts 4–10, leaflike, oblanceolate, entire, pinnatifid or pinnate, often longer than umbels. Flowers small, white, bisexual. Calyx teeth obsolete. Petals oblong, apex acute and incurved. Stylodium shortly conic or conic. Fruit oblong-ovoid or oblong-linear, gradually tapered to apex, slightly flattened laterally, commissure constricted; ribs 5, obtuse ridged; vit-
tare 1 in each furrow, 2 on commissure. Seed face slightly concave. Carpophore bifid at apex.

About 22 species: mainly in S Asia, Australasia, and Central and South America; one species (endemic) in China.


山茉莉芹


Plants 6–20 cm high. Tap root short. Petioles 2–6 cm; leaf blade 1.5–3.5 × 1–2 cm; pinnae 2–3 pairs, the proximal short-petiolulate; ultimate segments linear, linear-lanceolate or oblanceolate, entire or 2–3-lobed, hirsute to glabrous. Peduncles 5–15 cm, hirsute; bracts 4–8, base slightly united, linear to oblanceolate, 1–2 × 2–10 mm, hirsute to glabrous; pedicels 10–20, much shorter than bracts, hirsute. Petals 1.2–1.5 × ca. 1 mm, glabrous to hirsute. Fruit purple-black, 3–4 × 2–5 mm, glabrous. Fr. Oct–Nov.

● Grassy slopes on mountain ridges; 2000–4000 m. C Taiwan.


滇芎属

P. kingdon-wardii; O. taiwaniana; O. nanhuensis

Haploseseli H. Wolff & Handel-Mazzetti.

Herbs perennial, glabrous. Taproot usually long, conic. Stem ribbed, base covered with fibrous sheath remnant. Leaf blade ovate-lanceolate, broadly triangular to oblong, 1–2-pinnate, rarely entire. Umbels terminal and lateral; bracts many, prominent, leaf-like, base entire, apex 3-lobed or pinnate; bracteoles present, entire or 3-lobed to pinnate. Calyx teeth minute or inconspicuous. Petals ovate, white, yellowish or dark purple, base shortly claw-like, apex obtuse-rounded or with shortly inflexed tips. Stylodium flattened, margin sinuolate; styles about as long as stylodium. Fruit ovoid to broadly ovoid, ribs 5, filiform, prominent; vittae 2–3 in each furrow, 2–4 on commissure. Seed face plane to concave. Carpophore parted at apex.

About ten species: Sino-Himalayan region; eight species (four endemic) in China.

This is a taxonomically complex genus in which species boundaries are not always clear, and generic limits (e.g., with Pleurospermum, Trachydium, and Trachydium) are problematic. Physospermopsis is one of a group of high-altitude Sino-Himalayan genera in need of a revision treating all taxa across their whole geographic range.

1a. Basal leaves simple, undivided ................................................................. 1. P. alepidioides

1b. Basal leaves 1–2-pinnate or 1–2-ternate/pinnate.

2a. Plants 5–10 cm high; stems reduced, often acaulescent ................................... 2. P. kingdon-wardii

2b. Plants above 20 cm high; stems not reduced.

3a. Bracts usually absent; bracteoles inconspicuous .................................................. 3. P. cuneata

3b. Bracts and bracteoles present, conspicuous.

4a. Base of leaf segments decurrent, rachis broadly winged .................................... 4. P. delavayi

4b. Base of leaf segments not decurrent, rachis not broadly winged.

5a. Basal leaves pinnate, nerves partly purple-red .............................................. 5. P. rubrinervis

5b. Basal leaves 2-pinnate, nerves not purple-red.

6a. Bracts entire, 3–5-lobed or nearly-pinnate ......................................................... 6. P. multiensis

6b. Bracts 2-pinnate, as the leaves.

7a. Leaf sheaths broad-membranous; bracteoles narrowly obovate, apex incised into 3 teeth or pinnatifid; fruit ribs plane .......................................................... 7. P. shaniana

7b. Leaf sheaths small, not broad-membranous; bracteoles broadly obovate, apex incised into 7–9 teeth; fruit ribs sinuolate .................................................. 8. P. obtusiuscula


全叶滇芎


Plants 40–70 cm. Stem branched. Basal petioles 4–10 cm, narrowly winged, sheaths narrow; leaf blade obovate or obovate-lanceolate, ca. 8 × 2–3 cm, simple, base cuneate, margin sparsely serrate. Umbel to 12 cm across; peduncles 15–25 cm, scabrous; bracts 4–7, lanceolate or oblong, 5–15 mm, apex 2–3-lobed, margin dark purple; rays 6–13, 2.5–8.5 cm, unequal; bracteoles several, ovate-lanceolate, 2–3.5 × 1–1.5 mm, entire or 2–3-lobed at apex; pedicels 2–4 mm. Calyx teeth minute, ovate-triangular, ca. 0.2 mm. Petals broadly elliptic to obovate, white, 1.5–1.8 mm, apex obtuse. Young fruit ovoid, ca. 2 × 1.8
mm, lateral furrows wider than the dorsal; ribs prominent, somewhat verrucose; vittae 3 in each furrow, 4 on commissure. Seed face plane. Fl. and fr. Jul–Oct.

- Open forests, grasslands; 2200–3300 m. SW Sichuan.

This unusual, poorly known taxon is recorded only from a few collections.


小滇芎 xiao dian xiong


Plants 5–10 cm. Root long-conic, 2–8 cm. Stem shortened, sometimes to 10 cm, often acaulescent. Basal petioles 2–6 cm, sheaths ovate; blade ovate-oblong in outline, 2–4 × 1.5–2 cm, pinnate; pinnae 2–4 pairs, pinnatifid; ultimate segments lanceolate or oblanceolate, 4–7 × 1–2 mm, entire or 2–3 lobed. Umbels terminal, 3–10 cm across; peduncles (0–)2–4 cm; bracts 1–5, 2–3 cm; rays 5–12–20, ribbed, 1–10(–13) cm, unequal, often spreading; bracteoles 2–5, lanceolate, nearly as long as flowers; umbellules 8–14 mm across, 10–25-flowered; pedicels unequal. Calyx teeth minute, triangular. Petals white, yellowish or blue-purple, ca. 1 × 0.8 mm. Fruit broadly ovoid; ribs prominent, often sinuate, immature fruit sometimes with sparse minute warts; vittae 2–3 in each furrow, 4–6 on commissure. Seed face slightly concave. Fl. Jul–Sep, fr. Aug–Nov.

- Forests, grassy meadows, damp marshes; 2700–4800 m. SE Xizang, NW Yunnan [Bhutan, Nepal, Sikkim].

The distinction between this and other dwarf, high-altitude species in the Himalayan region is a continuing problem; see also Pleospermum nanum and Trachydium.


楔叶滇芎 xie ye dian xiong

Sinodielsia cuneata (H. Wolff) Pimenov & Kljuykov.

Plants 30–40 cm. Root stout, long-conic. Stem slender, ribbed, a little branched above. Basal petioles 6–15 cm, flattened, sheaths short, narrow; blade broadly rhombic-ovate in outline, ternate/pinnate; pinnae 3-parted; ultimate segments oblong, 8–15 × 2–5 mm, apex 2–5 lobed, base cuneate, slightly decurrent. Umbels terminal, ca. 2–4.5 cm across; peduncules 5–10 cm; bracts often absent, rarely 1, ovate, 1–1.2 cm; rays 5–6, slender, 2–4 cm, unequal; bracteoles 4–6, linear, shorter than pedicels; umbellules 8–15–flowered. Calyx teeth triangular-ovate, to 0.5 mm. Petals white, ca. 1.3 × 1 mm, midvein conspicuous, apex obtuse. Young fruit broadly ovoid, ca. 2 × 2 mm, mature fruit unknown. Fl. and fr. Oct–Dec.

- Open grasslands; 3300–3400 m. Sichuan, Yunnan.

This species is unusual within the genus by the lack of conspicuous bracts and bracteoles. However, it is a poorly known taxon, recorded only from a few collections. The generic assignment is therefore tentative pending further study, as the species may be better placed in Tongola or, if recognized, Sinodielsia.


滇芎 dian xiong


Plants 55–75 cm. Root stout, long-conic. Stem branched above. Basal petioles 4–7.5 cm, winged, sheaths narrow-oblong; blade triangular or ovate-oblong in outline, 3.5–8 × 2.5–6.5 cm, pinnate/pinnatifid, rachis conspicuously winged; ultimate segments obovate to obovate-oblanceolate, 2–3 × 1–2.5 cm, base decurrent, margin incised-serrate, often 3 lobed, the central lobe larger than the laterals. Leaves reduced upwards. Umbels 1.5–8 cm across; peduncles 7–20 cm; bracts 4–5, leaf-like, 7–13 mm, apex usually 2–3 lobed, purple-green; rays 5–11, 1–5.5 cm; bracteoles 3–4, ovate-lanceolate or oblanceolate, 4–6 × ca. 2 mm, entire or 3 lobed; umbellules 6–12 mm across, 7–14-flowered; pedicels 3–5 mm. Calyx teeth suborbicular or ovate-triangular, ca. 0.2 mm. Petals white, 2–2.2 mm. Fruit broadly ovoid, 2–3.5 × 2.5–4 mm; ribs filiform, somewhat sinuate; vittae 2 in each dorsal furrow, 3 in each lateral furrow, 4 on commissure. Seed face concave. Fl. May–Aug, fr. Jul–Sep.

- Open grasslands; 2800–3900 m. Sichuan, Yunnan.


紫脉滇芎 zi mai dian xiong


Plants 35–50 cm. Root stout, long-conic. Stem dark purple, little branched above. Basal petioles 5.5–9 cm, sheaths ovate and membranous; blade ovate to broadly ovate in outline, 3.5–5 × 3–4 cm, pinnate; ultimate segments ovate or rhombic, 1.5–2.5 × 1–1.5 cm, base cuneate, margin coarsely incised-toothed or lobed, nerves partly purple-red. Leaves reduced upwards. Umbels 5–15 cm across; peduncles 6–23 cm; bracts 2–5, obovate-lanceolate, leaf-like, apex pinnate; rays 9–14, unequal; bracteoles 3–4, margin purple-red, nearly as long as flowers; umbellules 9–25-flowered, pedicels 2–4 mm. Calyx teeth small, triangular. Petals white, margin purple-red, ca. 0.8 mm. Fruit broadly ovoid, ca. 3 × 3 mm. Seed face concave. Fl. and fr. Aug–Oct.

- Open grasslands; 3200–4800 m. SW Sichuan, Yunnan [NE India, Nepal].


木里滇芎 mu li dian xiong

Plants 20–30 cm. Root long-conic. Stem branched. Basal and lower petioles 5–9 cm, narrowly winged, sheaths narrow; blade ovate-oblong in outline, 3.4 × 2.5–3 cm, 2-pinnate/pinnatifid; pinnae 3–5 pairs, ovate to long-ovate, 1–2 × 0.7–1 cm,

**Sinodielsia** H. Wolff.

Herbs perennial, essentially glabrous (scabrescent around nodes and at ends of peduncles and rays). Stem erect, branched above, striate. Leaves petiolate, sheathing; blade broadly deltoid, 3-pinnate/pinnatifid; pinnae 4–9 pairs, leaflets deeply pinnate-lobed, serate. Umbels compound, terminal and lateral, large; terminal peduncle long and thick; bracts 1–3 or 0; rays many, unequal, quadrangular, scabrid at the angles; bracteoles many, narrow; umbellules many-flowered. Flowers polygamous. Calyx teeth large, conspicuous, lanceolate-subulate. Petals obovate, white, medial rib yellow, apex narrow inflexed, base clawed. Stylopodium conic, about 1 mm across; pedicels 9–13 cm; bracts 5–6, 1.5–2 × 1–1.8 cm, ribs filiform, sparse scattered warts, especially on ribs; vittae 3 in each furrow, 4 on commissure. Seed face concave. Carpophore 2-parted.

Three species: Sino-Himalayan region; two species (one endemic) in China.

The classification of *Meeboldia*, *Tongoloa*, and *Vicatia* is problematic; see *Tongoloa* for a discussion of the issues.

1a. Ultimate segments of leaves 5–15 × 3–12 mm, widely spaced; rays 1–3; calyx teeth 0.3–1.2 mm

1b. Ultimate segments of leaves 12–15 × 2–7 mm, closely spaced; rays 3–7; calyx teeth 0.5–1 mm


Norman (1938); Pleurospermum cruciatum (H. Wolff) M. Hiroe; Sinodielsia microloba Kljuykov.

Plants 40–70 cm. Taproot fusiform, annular scars several, prominent. Basal petioles 2–13 cm, sheaths short, broad, membranous; blade 2–3-pinnae, 8–14 × 5–10 cm; pinnae 4–6 pairs, lower pinnae long-petiolulate; ultimate segments obovate-linear, 5–15 × 3–12 mm, widely spaced, deeply lobed or irregularly serrate. Leaves reduced upwards, uppermost small, short petiolate or sessile. Umbels 4–7 cm across; peduncles 8–15 cm; bracts and bracteoles often absent, sometimes several. Calyx teeth lanceolate-acute, 0.3–0.6 mm. Petals ca. 1.2 × 1 mm. Fruit ca. 3 × 2 mm. Fl. Jul–Sep, fr. Sep–Oct.

- Sparse forests on mountain slopes, grassy places, rock crevices; 2000–3500 m. SE Xizang, Yunnan.

The plants are used in Yunnan as a regional substitute for the medicine “gao ben” (Ligusticum sinense and L. jeholense).


東俄芹属 dong e qin shu

Pan Zehui (潘泽惠); Mark F. Watson

Herbs perennial, essentially glabrous, often scabrous at nodes and base of umbel. Taproot long-conic. Stem slender, thinly ribbed or striate, usually branched, petiolar remnants not persistent. Leaves petiolate; petioles sheaths inflating, membranous; blade triangular to broadly lanceolate, 3-ternate/pinnate or 2–3-pinnae; ultimate segments narrow. Umbels terminal or lateral; bracts and bracteoles often absent, sometimes several. Calyx teeth minute. Petals obovate to elliptic-ovate, white, pink or dark purple (often variable within a species), base claw-like, apex obtuse or notched with incurved tips. Stylopodium short-conic or depressed. Fruit broadly ovoid, base cordate or obtuse, slightly constricted, slightly laterally compressed, glabrous; ribs 5, filiform; vittae (2–3) in each furrow, (2–3) on commissure. Seed face concave. Carpophore divided half its length or more.

About 15 species: high-altitude Sino-Himalayan region, mainly in SW China, extending west to C Nepal; 15 species (13 endemic) in China.

This is a poorly defined genus is in need of revision based on new, comprehensive material. Many of the Chinese species are incompletely known with no specimens bearing mature fruit. Specific boundaries are often unclear, and this treatment should be considered provisional. Generic delimitation between Meeboldia, Sinodielsia, Tongoloa, and Vicatia continues to be problematic and controversial. Some authors accept the genus Sinodielsia to contain five species (S. bipinna, S. digitata, S. microloba, S. thibetica, and S. yunnanensis), whereas others include S. bipinna and S. thibetica in Vicatia and the remainder in Meebolda. The latter classification is adopted for the Flora of China pending detailed revision including all Chinese taxa in these genera.

Tongoaloa souliei (H. de Boissieu) H. Wolff (Pflanzenr. 90(IV. 228): 319. 1927; Pimpinella souliei H. de Boissieu, Bull. Herb. Boissier, sér. 2, 2:810. 1902) was described from W Sichuan (“Tongolo,” J. A. Soulié s.n., holotype, P). It is not treated in this account as it is imperfectly known.

1a. Bracts and bracteoles usually both present, (2–3)–6, linear.

2a. Basal leaves 1–2-ternate or 2–3-ternate/pinnate; ultimate segments ovate to lanceolate-ovate, margin irregularly pinnate or coarsely serrate.

3a. Leaves 1–2-ternate, nerves purplish-red ................................................................. 1. T. rubronervis

3b. Leaves 2–3-ternate/pinnate, nerves not purplish-red ..................................................... 2. T. stewartii

2b. Basal leaves 2–3-pinnate or 3–4-ternate/pinnate; ultimate segments linear, entire or 1–3-toothed.

4a. Basal leaves 2–3-pinnate; bracts absent.

5a. Rays up to 4 cm, equal; bracteoles entire ................................................................. 3. T. pauciradiata

5b. Rays up to 6 cm, unequal; bracteoles apex pinnate ..................................................... 4. T. napifera

4b. Basal leaves 3–4-ternate/pinnate; bracts usually present.

6a. Plants ca. 40 cm; rays ca. 8 ....................................................................................... 5. T. zhongdianensis

6b. Plants 50–110 cm; rays 8–19 .................................................................................... 6. T. loloensis

1b. Bracts and bracteoles both absent (bracts of T. gracilis, T. silaifolia, and T. smithii sometimes developed).

7a. Plants less than 30 cm.

8a. Ultimate segments of leaves 4–6 × 2–3 mm; rays 3–5 cm ............................................ 7. T. taeniophylla

8b. Ultimate segments of leaves 1–4 × 0.5–1.5 mm; rays 1.5–3 cm.
9a. Plants to 15 cm; ultimate segments of leaves 3–4 × 0.5–1.5 mm .................................  8. T. rockii
9b. Plants 15–30 cm; ultimate segments of leaves 1–2 × 1–1.2 mm ........................................  9. T. filicaudicis
7b. Plants more than 30 cm.
10a. Ultimate segments of leaves less than 5 mm.
11a. Rays thick, 4–9 cm .................................................................................................  10. T. tenuifolia
11b. Rays slender, ca. 4 cm .............................................................................................  11. T. smithii
10b. Ultimate segments of leaves mainly more than 7 mm.
12a. Leaves 3–4-ternate/pinnate or 3–4-pinnate; ultimate segments 0.5–1 mm wide ................  12. T. elata
12b. Leaves 2–3-pinnate; ultimate segments (0.8–)1–3 mm wide. 
13a. Ultimate segments of leaves 2–4.5 cm ........................................................................  13. T. dunnii
13b. Ultimate segments of leaves 0.3–1.5 cm.
14a. Ultimate segments of leaves 5–18 × 1–2 mm; rays 8–22; petals usually purple ............  14. T. silaifolia
14b. Ultimate segments of leaves 3–10 × ca. 1 mm; rays 5–11; petals usually white ............  15. T. gracilis


红脉东俄芹  hong mai dong e qin

Plants 30–55 cm. Stem branched above. Basal petioles 8–14 cm, slender, sheaths broadly inflated; blade broadly triangular in outline, 3–5.5 × 4–6 cm, 1–2-ternate; lower pinnate short-petiolate, subtropical or broadly ovate, 3-lobed; ultimate segments lanceolate-ovate, margin irregularly pinnate or coarse-serrate, nerves purplish-red. Umbels ca. 7 cm across; peduncles 14–32 cm; bracts absent or 1–2, linear, 4–10 mm, purplish-red; rays 12–18, 1.5–4 cm, unequal; bracteoles 3–5, linear; umbellules 13–21-flowered; pedicels unequal. Calyx teeth minute, triangular-ovate. Petals obovate, white. Young fruit ovoid (mature fruit not known). Fl. Oct.

- Coniferous forests; ca. 3700 m. SW Sichuan (Mulii).

This poorly known species is recorded only from the type gathering.


牯岭东俄芹 gu ling dong e qin

Physospermopsis wolffiana Fedde ex H. Wolff; Pimpinella stewardii (H. Wolff) M. Hiroe; Pleurospermum cavaleri M. Hiroe.

Plants 30–100 cm. Stem hollow,  branched. Basal petioles 8–14 cm, slender, sheaths broadly inflated; blade broadly triangular in outline, 3–5.5 × 4–6 cm, 1–2-ternate; lower pinnate short-petiolate, subtropical or broadly ovate, 3-lobed; ultimate segments lanceolate-ovate, margin irregularly pinnate or coarse-serrate, nerves prominent on both sides. Leaves reduced upwards, Umbels 3–10 cm across; peduncles 5–15 cm; bracts 1–3, linear; rays 11–15, 3–7 cm; bracteoles 3–6, linear, shorter than pedicels; umbellules 9–20-flowered; pedicels unequal. Calyx teeth small, rounded or ovate, 0.2–0.5 mm. Petals orbicular or obovate, white, 1.5–2 × 1–1.8 mm, apex obtuse-rounded. Anthers dark purple. Fruit ovoid-globose, base cordate, 2.5–3 × 2–3 mm. Fl. and fr. Jun–Nov. n = 11*.

- Damp grasslands in valleys; 800–3000 m. Jiangxi, NW Yunnan.


少辐东俄芹  shao fu dong e qin

Plants 10–20 cm. Stem simple or branched above. Lower leaves few; petioles slender, nearly as long as blades; blades narrowly triangular, 2-pinnate; pinnate petiolulate, terminal pinnae sessile; ultimate segments cuneate-obovate or rounded, 3–8 × 2–5 mm, apex 3-lobed. Umbels ca. 6 cm across, terminal with long peduncles; bracts absent; rays 3–8, to 4 cm, equal, spreading; bracteoles numerous, linear, longer than pedicels; umbellules 20–25-flowered. Young fruit oblong-ovate, truncate at base (mature fruit not known). Fl. Aug.

- Lakeshores with open sandy soils; 3200–4000 m. Qinghai, Xizang.

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


裂苞东俄芹 lie bao dong e qin


Plants 20–30 cm. Root short-napiform. Stem stout, ribbed and branched. Basal leaves few; petioles slender, sheaths small; blades broad-triangular, ca. 15 × 8–10 cm, 3-pinnate; pinnate 7-paired, basal pinnate short petiolulate, broad-obovate, 0.5–1 cm, base cuneate, margin pinnate; ultimate segments 2–4 × ca. 1.5 mm. Primary umbels ca. 12 cm across; peduncles ca. 5 cm; bracts absent; rays unequal, up to 6 cm; bracteoles 3–5, linear, apex pinnate, similar to leaves; umbellules 15–20-flowered; pedicels unequal, plane-winged, up to 5 mm. Calyx teeth conspicuous, ovate-triangular. Petals broad-obovate, apex obtuse. Young fruit cordate, ca. 1.5 × 2 mm (mature fruit not known). Fl. Aug.

- About 4000 m. NW Sichuan.

This incompletely known species is recorded only from the type gathering.


中甸东俄芹 zhong dian dong e qin

Plants ca. 40 cm. Stem purplish. Basal petioles 7–9 cm, sheaths narrow-obovate; blade triangular in outline, 7–7.5 × 8–9 cm, 3–4-pinnate; ultimate segments linear, 2–4 × 1–1.5 mm. Umbels ca. 7–8.5 cm across, peduncles 4.5–12 cm; bracteoles
4–5, linear-lanceolate, 4–5 mm, scarious-margined, purplish-red; rays ca. 8, 2.5–4.5 cm, unequal; bracteoles 4–5, linear-lanceolate; umbelles many-flowered, pedicels short. Calyx teeth minute, triangular. Petals white or purplish-white, ovate, base narrow, apex with incurved tips. Young fruit ovate, teeth minute, triangular. Petals white or purplish-white, obovate; umbellules many-flowered, pedicels short. Calyx 4–5, linear-lanceolate, 4–5 mm, scarious-margined, purplish-red. Ovary broad-ovate. Stylopodium depressed. Fruit ovoid to broadly ovoid, 1.2–1.5 × 1–1.3 mm, apex obtuse-rounded. Anthers yellow or tinged with purplish. Young fruit broadly ovoid, ca. 0.5 mm. Mature fruit not known. Fl. Jul–Aug. fr. Aug–Oct.

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


Plants 15–30 cm. Root brown, fusiform or napiform, 1–2 × 0.4–0.5 cm. Stem branched above. Lower pediels long; blades triangular, 3–4.5 cm, 3-ternate/pinnate; pinnate short petioli, ultimate segments obovate or oblanceolate, 1–2 × 1–1.2 mm, sometimes 2–3-lobed, apex acute. Umbels ca. 5 cm across; peduncles 5–7 cm; bracts and bracteoles absent; rays 7–9, 1.8–2.7 cm; umbellules 9–10-flowered, ca. 1 cm across; pedicels 2–5 mm. Calyx teeth obsolete. Petals obovate, white, base clawed, apex round, slightly radiant, up to 1.5 mm. Mature fruit not known. Fl. Jul–Aug.

8. *Pimpinella filicaudicis* H. de Boissieu; *Trachydium filicaudicis* (Franchet) H. Wolff in Engler, Pflanzenr. 6: 125. 1894; *Pimpinella loloensis* de Bॽissieu; *Trachydium loloense* (Franchet) M. Hiroe.

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


Plants 50 cm. Stem little-branched. Basal leaves few; petiels sheaths oblong; blade broadly triangular or rhombic-triangular, 3–4-ternate/pinnate; primary and secondary pinnate petioli, ultimate segments linear, 3–5 × 0.5–1 mm. Umbels to 15 cm across; peduncles 8–25 cm; bracts and bracteoles absent; rays thick, 6–11, 4–9 cm, spreading-ascending; umbellules many-flowered, ca. 1.5 cm across; pedicels slender. Calyx teeth minute, ovate. Petals obovate, white, rarely pinkish, apex obtuse-acute. Anthers yellow or tinged with purplish. Young fruit broadly ovoid, 2–2.5 × ca. 2 cm (mature fruit unknown). Fl. Aug.

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


Plants 18–25 cm. Taproot short. Stem dark purple, little-branched. Basal petiels slender, sheaths oblong; blade triangular, 2.5–4 × 2.5–3.5 cm, 2–3-ternate/pinnate; pinnate 5–7 pairs; ultimate segments long-ovate to obovate-lanceolate, 4–6 × 2–3 mm, base cuneate, irregularly serrate distally. Umbels 5–8 cm across; peduncles 3–7 cm; bracts and bracteoles usually absent; rays 6–10, 3–5 cm, unequal, slender; pedicels unequal. Calyx teeth minute, ovate. Petals purple-red, rarely white, long-ovate, 1.2–1.5 × ca. 1 mm. Anthers dark purple. Young fruit broadly ovoid, ca. 2 × 1.5 mm (mature fruit not known). Fl. Aug.–Sep. fr. Oct.

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


Plants slender, 8–15 cm. Root brown, thick. Stem usually solitary, or 1–2-branched. Basal petiels slender, sheaths broad, 5–6 mm across; blade broadly triangular in outline, 2.5–6 × 2.5–5 cm, 4-pinnate/pinnatifid; pinnae (3–)5–7 pairs, petioli; ultimate segments lanceolate, 3–4 × 0.5–1.5 mm. Stem leaves reduced upwards. Umbels 2–4 cm across; bracts and bracteoles absent; rays 6–8, 1.5–3 cm, subequal; umbellules 10–15-flowered; pedicels slender, up to 5 mm, subequal. Calyx teeth minute, broad-ovate. Petals long-ovate, white or tinged purplish-red, ca. 2.5 mm, base claw-like, apex obtuse. Anthers purplish-red. Ovary broad-ovate. Stylopodium depressed. Fruit oblong-ellipsoidal, ca. 2 × 1.5 mm; ribs filiform. Fl. Jul–Aug. fr. Aug.–Oct.

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

**APIACEAE**

This is possibly conspecific with *Tongoloa loloensis*.
Plants 50–60 cm, purplish green. Stem flexuose-erect, branched from base. Basal petioles slender with short sheaths; blades broadly triangular, 4-terinate/pinnate; pinnae 5–7 pairs, remote, up to 2 cm, petiolo long; ultimate segments oblong-linear or linear, 4–7 × ca. 1 mm, ternately lobed, margin incrassate and mucronulate. Terminal umbels up to 6 cm across, peduncles long; bracts absent; rays 10, up to 4 cm, subequal; bracteoles absent or few, linear, almost as long as pedicels; umbellules ca. 20-flowered; pedicels ca. 5 mm, subequal. Petals broad-ovate, base long-clawed. Young fruit ovate, ca. 1.5 mm, base truncate (mature fruit unknown). Fl. Jul–Aug.

- Moorlands; ca. 4000 m. NW Sichuan.

This poorly known species is recorded only from the type gathering (H. Smith 4270. GB).


_Pimpinella elata_ (H. Wolff) M. Hiroe; _Tongoloa cneidi-folia_ K. T. Fu.

Plants 20–75 cm. Root conic. Stem purplish, little-branch- ed. Lower petioles 5–12 cm, sheaths ovate, inflated; blade broadly triangular, 4–10 × 3–8 cm, 3–4-terinate/pinnate; primary and secondary pinnate petiolo late; ultimate segments linear (3–) 5–15 × 0.5–1 mm. Umbels 4–9 cm across; peduncles 5–12 cm; bracts and bracteoles absent; rays 6–16, unequal, 2–4(–5) cm; umbellule many-flowered; pedicels 3–5 mm. Calyx teeth minute, triangular. Petals obovate to long-obovate, white, sometimes pink, 1.8–2 × 1.2–1.8 mm, apex obtuse-rounded. Fruit broadly ovoid, 2–4 × 1.5–2 mm, base cordate; ribs slender. Fl. Jul.–Sep, fr. Sep.–Oct. n = 8*.

- Grasslands, riversides, ditches; 2300–4300 m. Gansu, Qinghai, Sichuan.


宜昌东俄芹 da dong e qin


Plants 25–75 cm. Root conic. Stem purplish, conic. Fr. plant slender, 1.3–3 cm, membranous and clasping; blade broadly triangular, 2–3-pinnate; pinnae 4–5 pairs, short-petiolate; ultimate segments elongate-linear, 2–4.5 cm × 1.5–3 mm, entire. Umbels 5–10 cm across; bracts and bracteoles absent; rays 7–17, 3–6 cm; umbellules 10–25-flowered. Calyx teeth minute, ovate or triangu lar-ovate. Petals long-elliptic to obovate, white or greenish, 1.2–2 × ca. 1 mm, apex obtuse-acute. Young fruit broad-ovoid to cordate, ca. 1.5 mm (mature fruit unknown). Fl. Jun.


城口东俄芹 cheng kou dong e qin


Plants 28–60 cm. Root brown, conic. Stem purplish, branched. Basal and lower petioles 6–12 cm, sheaths oblonginflated; blade broadly ovate, (3–)5–8 × (2–)4–6 cm, 2–3-ter nate/pinnate; pinnae short petiolo late; ultimate segments linear, 5–18 × 1–2 mm, apex acute. Primary umbels 3–12 cm across; bracts absent; rays 8–22, 3–6 cm, subequal; bracteoles usually absent or 1–5, linear, shorter than the flowers; umbel lules 10–25-flowered, ca. 1 cm across; pedicels unequal. Calyx teeth minute, ovate or semi-oricbicular. Petals long-obovate, pur plish-red sometimes white, 1–12 × ca. 0.8 mm. Anthers pur plish-red, sometimes white. Stylodium dark purple, short conic. Fruit broadly ovoid, ca. 1.8–2.2 × 1.2–1.5 mm; ribs filiform. Fl. Jul.–Sep, fr. Sep.–Oct. n = 8*.

- Damp grasslands; 2200–4000 m. Chongqing, Qinghai, Shaanxi, Sichuan, Yunnan.

Some authors consider this taxon to be conspecific with _Tongoloa stewardii_. It has reputed medicinal value (in Shaanxi).


纤细东俄芹 xian xi dong e qin

_Pimpinella tilia_ M. Hiroe.

Plants 25–75 cm. Taproot slender. Stem purplish, branch- ed. Lower leaves long-petiolate, petioles slender, sheaths narrow-oblong; blade broadly ovate, 3–10 × 2–6 cm, 3-pinnate; lower pinnae short petiolo late; ultimate segments linear-lan ceolate, 3–8(–10) × ca. 1 mm, pinnatifid. Umbels 3.5–10 cm across; peduncles 3–12 cm; bracts and bracteoles absent; rays 5–11, 2.5–6 cm; umbellules many-flowered. Calyx teeth minute, ovate-triangular or semi-oricbicular. Petals obovate, white or pinkish, notched with incurved tips. Fruit oblong-ellipsoid, ca. 2 × 1.3 mm; ribs filiform. Fl. Aug.–Sep, fr. Sep.–Oct.

Forest margins, meadows; 2300–4500 m. Gansu, Qinghai, Shaan xi, Sichuan, Xizang, Yunnan [?Bhutan, NE India].


明党参属 ming dang shen shu

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs, perennial, glabrous, withering during summer, sprouting in winter to early spring. Taproot stout, fusiform or irregularly thickened. Stem erect, branched above, rigid, glaucous, base with papery remnant sheaths. Leaves petiolo late; blade broadly ovate, ternate-2–3-pinnatisect. Umbels compound, loose; peduncles terminal and lateral; bracts absent or few; rays spreading; bracteoles few.
Calyx teeth inconspicuous, minute. Petals white, oblong or ovate-lanceolate, apex acute and inflexed. Stylopodium low-conic; styles reflexed. Fruit ovoid-globose to ovoid-oblong, slightly flattened laterally, commissure constricted, 10–12 striped, smooth; ribs inconspicuous; vittae numerous (ca. 20), scattered throughout the mesocarp. Seed face deeply sulcate. Carpophore 2-parted.

- One species.

**Changium angustilobum** P. K. Mukherjee & Kljuykov (Byull. Moskovsk. Obsč. Isp. Prir., Otd. Biol. 96(5): 71. 1991) was described from Xinjiang. It apparently differs from *C. smyrnioides* in having narrow, linear leaf lobes. No specimens of this species have been seen, and further study is needed to discern if this plant should be included in this otherwise endemic genus of E China.


**Conopodium smyrnioides** (H. Wolff) M. Hiroe.

Plants 50–100 cm. Taproot surface tawny to pale yellow, inner parts white, starchy. Branches remote and spreading, often alternate, branchlets alternate or opposite. Petiole 3–15 cm; blade 4–10 × 2–5 cm; pinnate broadly ovate, pinnatifid; ultimate segments oblong-lanceolate, 2–4 × 1.2 mm. Leaves reduced upwards, the uppermost reduced to linear or bladeless sheaths. Umbels 3–8 cm across; bracts absent or 1–3, small, ca. 1 cm; rays 4–10, 2.5–10 cm, spreading; bracteoles few, linear, 4–6 mm; umbellules 8–20-flowered. Petals pale purplish when young becoming white. Fruit ovoid-globose, 2–3 × 1.8–2.5 mm, Fl. and fr. Apr–Jun.

- Mountain slopes in fertile areas, rock crevices; 100–300 m. Anhui, E Hubei, Jiangsu, NE Jiangxi, Zhejiang.

The root is used in E China as the traditional medicine “ming dang shen.”


**Conopodium cymosum** (H. Wolff) P. K. Mukherjee & Kljuykov (Byull. Moskovsk. Obsč. Isp. Prir., Otd. Biol. 96(5): 71. 1991) was described from Xinjiang. It apparently differs from *C. smyrnioides* in having narrow, linear leaf lobes. No specimens of this species have been seen, and further study is needed to discern if this plant should be included in this otherwise endemic genus of E China.

#### 3a. Bracteoles absent, rarely 1–2, abortive; pinnae 2–4 pairs

- **1a. Ultimate segments of leaves linear, 1–2 mm wide** .............................................................. 1. C. wollfianum

- **1b. Ultimate segments of leaves suborbicular, broadly ovate to ovate-lanceolate, 2–17 mm wide.**

#### 2a. Bracts and bracteoles absent ................................................................. 2. C. delavayi

#### 2b. Bracts or bracteoles present.

- **3a. Bracteoles absent, rarely 1–2, abortive; pinnate 2–4 pairs** ............................................. 3. C. viridiflorum

- **3b. Bracteoles well developed; pinnate (2–)4–6 pairs.**

#### 4a. Ultimate segments of leaves ovate to ovate-lanceolate; bracteoles linear, entire, often shorter than flowers ................................................................. 4. C. paradoxum

#### 4b. Ultimate segments of leaves long-ovate, broadly ovate to suborbicular; bracteoles linear to long-ovate, entire, lobed to pinnatifid, equal to or much longer than flowers.

- **5a. Ribs of fruit extended into undulate wings (Xizang)** ......................................................... 7. C. mallaeanum

- **5b. Ribs of fruit prominent, not undulate-winged.**

#### 6a. Plants usually stemless, less than 15 cm tall, unbranched; bracteoles linear to long-ovate, entire to pinnatifid ................................................................. 5. C. novemjugum

#### 6b. Plants usually with long stems more than 15 cm tall, branched above; bracteoles linear, entire to 3-toothed ................................................................. 6. C. thalictrifolium


Plants 40–70 cm. Root short thick. Lower petioles nearly as long as blades; sheaths narrow, membranous; blades oblong-ovate in outline, 10–20 × 2–8 cm; ultimate segments linear, 1.5–4 × 0.1–0.2 cm, acute. Uppermost leaves sessile; sheaths slightly inflated, white-margined. Umbels 2–3 cm across; peduncles 3–6 cm; bracts and bracteoles absent or aborted (squamuliform); rays 5–8, slender, 8–50 mm, very unequal. Calyx teeth small, triangular-ovate, ca. 0.3 mm, partly hidden by stylopodium. Petals broadly ovate, greenish, ca. 1 × 0.8 mm, base long-clawed, apex obtuse or acute. Stylopodium depressed, margin conspicuously spreading, crenulate, dark green to deep purple; ovary glabrous, ribbed. Fruit ovoid, ca. 2.5 × 1.3 mm; ribs prominent. Fl. Aug, fr. Sep.
The poorly known taxon is recorded only from a few collections.


鹤庆矮泽芹 he qing ai ze qin


Plants 10–20(–33) cm. Root branched. Basal petioles 2.5–5 cm; sheaths broad, long-ovate; blade oblong in outline, 3–6 × 1.5–2.5 cm; pinnae 4–6 pairs, overlapping; ultimate segments broadly ovate or suborbicular, 8–15 × 6–13 mm, base truncate, apex obtuse, 2–3-crenulate. Umbels ca. 4–5 cm across; bracts and bracteoles absent; rays 5–6, 1–3 cm, unequal; pedicels 8–17, 2–4 mm. Calyx teeth suborbicular, small, obscured by stylopodium. Petals obovate or orbicular, white or greenish-yellow, ca. 1.5 × 1 mm. Fruit oblong-ellipsoid, 1.8–2.9 × 1–1.5 mm; ribs prominent, sometimes obscure. Fl. Jul–Aug, fr. Aug–Sep.

• Damp grassy slopes; 3200–4800 m. Qinghai, Sichuan, Xizang, NW Yunnan.

This species has reputed medicinal value.


粗棱矮泽芹 cu leng ai ze qin


Plants 5–12 cm. Taproot stout, 5–23 cm. Stem shortened, plants usually acaulous. Basal petioles 1.5–5 cm, sheaths long, broad; blade oblong, 2.4–1.2 cm, pinnate; pinnae sessile, 4–6 pairs, remote; ultimate segments long-ovate to suborbicular, 5.10 × 3–8 mm, base subtruncate or rounded, entire or apex shallowly 3-toothed, sometimes 3–4-crenate; terminal pinnae obovate or orbicular, base cuneate, apex more deeply 3-lobed. Umbels usually sessile, 5–17 cm across; bracts 4–5, pinnate, leaf-like; rays 9–18, 2–8 cm, unequal, ribbed; bracteoles 3–7, linear, oblanceolate or long-ovate, entire, 3–5-lobed to pinnatisect, nearly equal to much longer than flowers. Calyx teeth minute, hidden under the spreading stylopodium. Petals obovate or orbicular, ca. 1.5 × 1 mm, white or greenish, apex obtuse. Fruit oblong-ellipsoid ca. 3.5 × 2 mm, ribs prominent. Fl. Jun–Aug, fr. Aug–Sep.

Grassy slopes, riversides; 3400–4700 m. Sichuan, Xizang, NW Yunnan [Bhutan, Nepal, Sikkim].

This species has reputed medicinal value.


松潘矮泽芹 song pan ai ze qin

Trachydium thalictrifolium (H. Wolff) M. Hiroe.

Plants 15–40 cm. Root slender, brown. Stem branched above. Basal and lower petioles 4–15 cm; sheaths long, membranous; blade oblong, 2.5–8 × 1.5–3.5 cm, pinnate; pinnae 2–6 pairs, remote; ultimate segments ovate or broad-ovate, 0.8–2 × 0.7–1.7 cm, base truncate to broad-cuneate, apex 3–5-toothed or irregularly serrate; terminal pinnae broadly obovate or suborbicular, base cuneate, apex often 3-lobed. Umbels ca. 5 cm across; bracts 2–4, linear to linear-lanceolate, pinnate; rays 6–13, unequal, spreading, ribbed; bracteoles 2–5, linear, entire or 3-toothed, longer than flowers; pedicels many, 2.5–3 mm. Calyx teeth minute, hidden by stylopodium. Petals white or green-
ish, obovate or suborbicular, apex slightly incurved. Fruit oblong-ellipsoid, ca. 2.5 × 2 mm; ribs all prominent. Fl. and fr. Jul–Aug. n = 6*.

- Grassy slopes; 3200–4000 m. Gansu, Sichuan, Xizang, Yunnan.

This species has reputed medicinal value.


聂拉木矮泽芹 nie la mu ai ze qin

Plants 30–50 cm. Stem stout, unbranched. Lower petioles 6–8 cm; sheaths small; blade oblong to oval, 3–5 cm; pinnae 2–5 pairs; ultimate segments broadly ovate, 1–1.5 × 1–1.2 cm, base cuneate, margin irregularly dentate or serrate lobed, apex acute. Terminal umbels ca. 5 cm across, much larger than the lateral; peduncles stout, ca. 10 cm; bracts several, 2–3.5 cm, leaf-like; rays 8–14, 2.5–7 cm, unequal; bracteoles 4–6, 4–8 mm, 3–5-serrate lobed; umbellules 15–20-flowered; pedicels unequal, 2–10 mm. Calyx teeth ovate, mostly hidden by stylopodium. Petals obovate, indistinctly clawed. Stylopodium low-conic. Fruit narrow-ovoid, 3–4 × 1.5–2 mm; ribs all extended into undulate wings. Fl. & fr. Aug–Sep.

Dwarf *Rhododendron* scrub, grasslands; 4200–4400 m. S Xizang (Nyalam) [C Nepal].

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


棱子芹属 leng zi qin shu

Pan Zehui (潘泽惠); Mark F. Watson

*Aulacospermum* Ledebour; *Hymenium* de Candolle; *Hymenolaena* de Candolle; *Pterocyclus* Klotzsch.

Herbs perennial, rarely biennial. Root crown often surrounded with fibrous remnant sheaths. Stems erect, sometimes shortened. Leaves 1–4-pinnate or ternate-pinnate; ultimate segments serrate to incised or pinnate. Umbels terminal and lateral; bracts several, entire or pinnate, margin usually white scarious; rays often extending in fruit; bracteoles numerous, scarious, sometimes white margins. Calyx teeth conspicuous or obsolete. Petals oblong to broad-ovate, white or purple-red, base clawed, apex narrow, inflexed. Stylopodium conic or short-conic. Fruit oblong to broad-ovoid, slightly flattened laterally, glabrous, often with numerous, shining tubercles; ribs prominent and acute, sometimes undulate, cristate or narrowly winged; vittae 1(–3) in each furrow, 2(4 or 6) on commissure. Seed face concave. Carpophore 2-parted.

About 50 species: N Asia, E Europe, and especially diverse in the Himalayan region and W China; 39 species (22 endemic) in China.

This is a widespread, heterogeneous genus of complex and controversial taxonomy. Russian authors delimit *Pleurospermum sensu stricto* by only two species (the type, *P. austriacum* Linnaeus, and *P. uralense*), referring the other species to *Aulacospermum*, *Hymenium*, *Hymenolaena*, *Physospermopsis*, and *Pterocyclus*. Other morphologically similar genera, where generic boundaries become indistinct, include *Trachydium* and *Pseudotrachydium* (Kljuykov et al.) Pimenov & Kljuykov. A full discussion of the Russian classification of *Pleurospermum* is presented by Pimenov and Kljuykov (Feddes Repert. 111: 499–515, 517–534, 535–552. 2000). As yet, this rather radical classification has not gained widespread acceptance, and the proponents admit that this is a taxonomic hypothesis, and (particularly for some groups) a more natural classification will only be possible following critical revision in the field and herbarium. A traditional treatment is adopted for the following account, with due influence from the work of the Russian taxonomists.

1a. Plants of high altitudes, (3500–)4000–5000 m, short and squat 5–20(–40) cm; stems usually much reduced, often thickened, unbranched.
2a. Bracteole apex acute, acuminate or obtuse.
3a. Fruit wings narrow, crisped; calyx teeth lanceolate; rays thickened, particularly at the distal ends; pedicels flattened and winged

1. *P. nubigenum*

3b. Fruit wings narrow or broad, plane; calyx teeth triangular or obsolete; rays uniform thickness, pedicels terete.
4a. Petals white; fruit thinly winged; calyx teeth triangular; vittae 3 per furrow

2. *P. pulszkyi*

4b. Petals purple-red; fruit broadly winged; calyx teeth obsolete; vittae 2 per furrow

3. *P. lindleyanum*

2b. Bracteole apex 1–2-pinnate/pinnatifid; ultimate leaf segments linear, 0.3–0.5 mm broad; pedicels flattened

4. *P. heterosciadium*

5b. Bracteole apex 1-pinnate/pinnatifid; ultimate leaf segments lanceolate, 0.5–5 mm broad; pedicels terete.
6a. Compact rosette, stemless; inflorescence densely capitate, sub sessile; rays reduced, crowded; fruit wings broad and sinuate, not dentate

5. *P. hedini*

6b. Stems usually distinct; inflorescences not densely capitate, usually distinctly pedunculate; rays not reduced, lax; fruit ribs prominent or irregularly dentate or sinuate winged.
7a. Umbels usually sub sessile; rays very unequal; fruit tuberculate, wings irregularly dentate

8. *P. astrantioideum*

7b. Umbels distinctly pedunculate; rays subequal; if fruit winged then not tuberculate.
8a. Plants with strong unpleasant odor; rays 14–30; fruit wings irregularly dentate

9. *P. foetens*

8b. Plant without unpleasant odor; rays 5–15(–20); fruit ribs prominent to narrowly winged, wing margin entire.
9a. Leaves 1–2-pinnate, ultimate segments ovate or orbicular; fruit ribs all broadly winged
9b. Leaves 2–3-pinnate, ultimate segments linear-lanceolate; fruit ribs prominent or narrowly sinuate-winged ................................................................. 7. P. nanum

1b. Plants from varying altitudes and habitats, usually much larger (0.3–2 m), smaller specimens slender-stemmed.

10a. Large, often robust plants, (0.5–0.8–2 m, rarely shorter.

11a. Leaflets of lower leaves broadly ovate, regularly serrate; ovate bases usually cuneate to decurrent.

11b. Leaflets of lower leaves variously lobed and dissected, not pinnatifid, not broadly ovate, bases usually cuneate to decurrent.

12a. Umbels 8–10 cm across; rays 15–20, 4–7 cm; fruit 8–10 × 4–6 mm ................................................. 10. P. stylosum

12b. Umbels 2–4 cm across; rays 6–8(–15), 0.6–2 cm; fruit 7–8 × 3–4 mm ............................................. 11. P. rotundatum

13a. Plants usually very robust, thick-stemmed (except P. stylosum); umbels (7–)12–28 cm across; rays (15–)25–40.

13b. Plants less robust, slender-stemmed; umbels 3–15 cm across; rays 7–28.

14a. Plants usually very robust, thick-stemmed (except P. stylosum); umbels (7–)12–28 cm across; rays (15–)25–40.

14b. Umbels 8–10 cm across; rays 15–20, 4–7 cm; fruit 8–10 × 4–6 mm .................................................. 10. P. stylosum

15a. Ultimate leaf segments pinnatifid, lobes linear; calyx teeth conspicuous, triangular-ovate; fruit wings thick, cristate (NW China) ................................................................. 13. P. uralense

15b. Ultimate leaf segments coarsely dentate, lobes ovate; calyx teeth obsolete; fruit wings thin, broad and plane (SW China) ................................................................. 14. P. aromaticum

16a. Petioles of upper leaves expanded into auriculate sheaths; fruit oblong, 8–15 mm.

16b. Petioles of upper leaves expanded into auriculate sheaths; fruit oblong, 8–15 mm.

17a. Leaves irregularly serrate; bracteoles ca. 5 mm broad; seed face deeply concave ......................... 15. P. angelicoides

17b. Leaves regularly crenate; bracteoles ca. 1 mm broad; seed face slightly concave ......................... 16. P. longicarpum

18a. Leaves 2–4-ternate/pinnate.

18b. Leaves 1–2-ternate/pinnate (3–5-partite to 2-ternate).

19a. Leaves with narrow ultimate segments 2–5 mm broad, hirtellous along the margins, lobes round, obtuse; primary umbel overtopped by laterals; bracteoles oblong to obovate, entire to 3-lobed at apex, lobes obtuse; petals white; fruit 4–5 mm ................................................................. 19. P. franchetianum

19b. Leaves with ultimate segments 0.3–1 mm broad, margin glabrous, lobes lacerate, acute; primary umbel not overtopped by laterals; bracteoles oblong/lanceolate, 3-lobed to pinnate/pinnatifid at apex, apex acute; petals white to pink; fruit 6–10 mm ............................................. 20. P. benthamii

20a. Leaves 3–5-partite (sometimes to 2-ternate).

20b. Leaves 2-ternate/pinnate.

21a. Leaves 3–5-partite (sometimes to 2-ternate); leaf bases and veins with coarse white hairs reminiscent of those of Heracleum; rays 2–4 cm; petals white ................................................................. 17. P. heracleifolium

21b. Leaves always 3-partite, without white hairs; rays 5–6 cm; petals pink ........................................ 18. P. macrochaenum

22a. Rays 10–18, 2–7 cm; bracteoles lanceolate, acute or 3-lobed; fruit smooth, wings sinuate but not irregularly dentate .................................................. 21. P. decurrens

22b. Rays 7–13, 1–2.5 cm; bracteoles linear-lanceolate, entire; fruits tuberculate with irregularly dentate wings .................................................. 22. P. cristatum

10b. Small, slender plants, 20–40(–50) cm rarely taller.

23a. Petiole wings greatly expanded, white with purple veining, upper leaves and bracts enveloping the inflorescence .......................................................................................................................... 23. P. amabile

23b. Petiole wings not greatly expanded, not purple veined.

24a. Leaves 1-pinnate to 2-pinnatifid; rays 2–4; bracteoles broadly ovate, entire ........................................ 24. P. bicolor

24b. Leaves 2–4-ternate/pinnate; rays (4–)6–25; bracteoles entire or more usually pinnatifid at apex.

25a. Stems, petioles and leaf rachis conspicuously white pubescent ........................................................ 26. P. pilosum

25b. Plants essentially glabrous, bases of umbels and/or petioles sometimes puberulent.

26a. Calyx teeth conspicuous, triangular to lanceolate.

26b. Calyx teeth conspicuous, triangular to lanceolate.

27a. Ultimate leaf segments 5–20 mm broad, irregularly serrate or incised ........................................ 25. P. yunnanense

27b. Ultimate leaf segments finely dissected, 1–8(–10) mm broad.

28a. Calyx teeth linear-lanceolate; sheaths of upper leaves and bracts broadly auriculate; bracteoles silvery white with a narrow green midrib, apex acuminate to 3-lobed ........................................ 27. P. album

28b. Calyx teeth triangular or rounded; leaf sheaths somewhat expanded but not auriculate; bracteoles usually white margined, but not conspicuously silvery white, apex usually pinnatifid.

29a. Rays 4–7, very unequal; bracteoles entire, apex acuminate ................................................................. 29. P. rupestre

29b. Rays (6–)8–20(–30), subequal (but see P. szechynii); bracteole apex pinnatifid (rarely acuminate).


31a. Plant without unpleasant odor when crushed; rays very unequal; fruit wings broad, sinuate but not dentate .......................................................................................................................... 30. P. szechynii
31b. Plant with a strong unpleasant odor when crushed; rays subequal; fruit wings broad, irregularly dentate .......................................................... 9. P. foetens
30b. Rays 6–12(–15).
32a. Leaf blades oblong-lanceolate in outline, approaching 2–3-ternate/pinnate; fruit wings broad, sinuate .......................................................... 31. P. wilsonii
32b. Leaf blades broadly ovate in outline, 3–4-ternate/pinnate; fruit ribs prominent to winged, but not sinuate.
33a. Ultimate leaf segments ca. 2 mm; calyx teeth ca. 1 mm, green ...................................................... 32. P. hookeri
33b. Ultimate leaf segments 3–5 mm; calyx teeth ca. 0.3 mm, dark purple ........................................ 33. P. tsekuense
26b. Calyx teeth obsolete or minute.
34a. Rays 5–9(–11); bracts and bracteoles entire, acuminate.
35a. Stems and leaf sheaths purple-red, rays subequal; bracteoles broad, longer than the flowers ....... 35. P. apiolens
35b. Stems and leaf sheaths green, rays very unequal; bracteoles-linear-lanceolate, shorter than the pedicels .............................................. 28. P. simplex
34b. Rays (9–)11–25; bracts and bracteoles pinnate/pinnatifid at apex, rarely acuminate.
36a. Larger plants, 30–60 cm; rays 10–25; fruit wings broad, sinuate or irregularly cristate/dentate.
37a. Rays subequal; fruit wings sinuate .......................................................... 37. P. linearilotobum
37b. Rays very unequal; fruit wings irregularly cristate/dentate .......................................................... 39. P. wrightianum
36b. Small slender plants, 20–35(–45) cm; rays 9–15; fruit ribs prominent to narrowly winged, but not sinuate or dentate.
38a. Rays 1.5–2.5 cm ........................................................................................................................ 38. P. giraldii
38b. Rays 4–12 cm.
39a. Stem branches often opposite or whorled; leaf rachis glabrous; ovary smooth ....................... 36. P. handelii
39b. Stem branches usually alternate; leaf rachis tuberculate on abaxial surface; ovary tuberculate.


青藏棱子芹  zhòu guō lēng lǐng qīn

Hymenidium nubigenum (H. Wolff) Pimenov & Kljuykov.

Plants dwarf, to 15 cm, near rosette. Root stout, 0.5–1 cm across. Stem greatly reduced, rarely branched. Petioles 2–4 cm, sheaths oblong, membranous; blades oblong, 4–6 cm, 2-ternate-pinnate; pinnae 4–5 pairs, only the basal petiolarate, ca. 1 cm; ultimate segments linear or linear-lanceolate, ca. 5 × 1–2 mm. Primary umbels 10–15 cm across; peduncle very short; bracts several, small, leaf-like; rays 6–15, 5–10 cm, stout, somewhat unequal, ribbed, thickening especially at distal parts; umbellules borne above leaves; bracteoles 10–15, obovate to oblong, 5–10 × 3–4 mm, margin broad, white, membranous, apex acute; pedicels numerous, 3–5 mm, flattened and winged. Calyx teeth triangular-lanceolate, ca. 0.5 mm. Petals white, spatulate, ca. 1.5 mm, apex obtuse. Fruit ellipsoid, dark gray-green, 3–4 mm; ribs crisped-winged; vittae 3 in each furrow, 5–6 on commissure. Fl. and fr. Jul–Aug.

- Alpine grasslands; ca. 4900 m. W Sichuan, E Xizang, NW Yunnan.

This rather poorly known taxon is recorded only from a few collections.


青藏棱子芹 qīng zàng lēng lǐng qīn

Hymenidium pulszkyi (Kanitz) Pimenov & Kljuykov; Pleurospermum kansuense H. Wolff.

Plants 8–40 cm, usually tinged purplish-red. Root stout, dark brown, branched. Stem stout, often reduced. Basal and lower stem leaves-long-petiolate, sheaths obovate; blades oblong or ovate, 3–10 × 1–3 cm, 1–2-pinnate; ultimate segments oblong or linear, 3–10 × 1–3 cm. Umbels 15–20 cm across; bracts 5–8, ovate or lanceolate, 2–5 × 0.3–1 cm, margin white or purplish-red, apex acute or pinnate; rays 5–10, 5–12 cm, slightly unequal; bracteoles 10–15, ovate or lanceolate, 1–2 cm, acuminate, longer than flowers; pedicels numerous, 5–8 mm. Calyx teeth conspicuous, triangular-ovate, ca. 0.8 × 0.5 mm. Petals obovate, white. Anthers dark purple. Fruit oblong-ovoid, 5–6 × 2–3.5 mm; ribs narrowly sinuate winged; vittae 3 in each furrow, 6 on commissure. Fl. Jun–Jul, fr. Aug–Sep.

- Alpine meadows, stony slopes; 3600–4600 m. Gansu, Qinghai, Xizang, NW Yunnan.


天山棱子芹 tiān shān lēng lǐng qīn

Hymenolaena lindleyana Klotzsch in Klotzsch & Garcke, Bot. Ergeb. Reise Waldemar, 150. 1862; Hymenolaena nana Ruprecht; Pleurospermum stellatum (D. Don) C. B. Clarke var. lindleyana (Klotzsch) C. B. Clarke.

Plants dwarf, near rosette, 5–30 cm. Root long-conic, 3–5 mm across. Stem inconspicuous, elongating in fruit, tinged purplish-red, papery remnant sheaths at base. Petioles 3–6 cm, sheaths oblong; blades oblong-elliptic, 3–8 × 0.8–3 cm, 2–3-ternate-pinnate; pinnae short-petiolute; ultimate segments oblong to linear, 2–10 × 1–2.5 cm, entire, apex obtuse. Umbels 3–5 cm across; bracts 2–4, oblong-ovate, 2–3 cm, shorter than rays, margin purple-red, 1–2-pinnate at apex; rays 4–7, 1–4 cm, unequal; bracteoles 8–12, oblong-ovate or obovate, 5–11 × 4–7
mm, slightly longer than flowers, mid band purple-red, margin broad, white, apex entire or 3-lobed, membranous; pedicels numerous, 4–5 mm, winged. Calyx teeth obsolete. Anthers dark purple. Winged fruit 4–5 mm; ribs all broadly sinuolate-winged; vittae 2 in each furrow, 4 on commissure. Fl. and fr. Aug.

Alpine grasslands; ca. 4000 m. W Xinjiang, Xizang [NW India, Kashmir, Pakistan].


垫状棱子芹  yi san leng zi qin

Hymenidium heterociadium (H. Wolff) Pimenov & Kljuykov; Physospermopsis fuscopurpurea (Handel-Mazzetti) Pimenov & Kljuykov; Trachydium fuscopurpureum Handel-Mazzetti.

Plants dwarf, near rosette, 10–25 cm. Root stout, 5–8 mm across, branched. Stem greatly reduced, ribbed, sparingly branched, base clothed with dense, brown fibrous remnant sheaths. Basal petioles sheaths oblong, membranous; blades oblong to narrowly ovate, 1.8–6 cm, 3-pinnate; pinnae 5–7 pairs, nearly sessile; ultimate segments linear to oblanceolate, 2–4 × 0.5 mm. Peduncle greatly reduced; bracts several, small, leaf-like; rays 8–15, 10–20 cm, unequal; bracteoles 10–15, broadly obovate in outline, 4–10 mm, pale green, margin white in lower half, apex 2-pinnate; pedicels numerous, flattened, 3–5 mm. Calyx teeth triangular, ca. 0.5 mm. Petal rounded, white to purplish-red, apex 3-lobed; pedicels numerous, thick, fleshy, 1–2 cm. Calyx teeth and rays 4–6 × 2.5–3 mm, papillate; ribs all broadly winged; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Jun–Aug.

Open grassy slopes; ca. 3500 m. SW Xizang [NW India, Kashmir, C and W Nepal, Pakistan].


矮棱子芹  ai leng zi qin

Physospermopsis nana (Franchet) Pimenov & Kljuykov; Physospermopsis purpurascens (Franchet) Pimenov & Kljuykov; Trachydium purpurascens Franchet.

Small plants, 5–15 cm, glabrous. Stem reduced, slender, ribbed. Basal leaves petiolate; petioles 2–5 cm; sheaths broadly oblong-lanceolate, membranous-margined; blades oblong-ovate, 3–5 mm, 2–3-pinnate; pinnae 4–5 pairs, only the basal pinnae petiolulate; ultimate segments linear-lanceolate, 1–3 × 0.5–1 mm, entire or 3-toothed at apex. Stem leaves gradually reduced upwards, petioles short or wholly sheathing. Umbels 5–7 cm across; peduncles very short; bracts 5–7, leaf-like, 2–3 cm; rays 5–15, slightly unequal, 3–6 cm; bracteoles 6–10, oblong-ovate to broadly obovate, 1–2-pinnate, 6–10 × 4–8 mm, about equal to flowers, pale green, margin whitish in lower half; pedicels 15–20, 3–5 mm. Calyx teeth small, triangular-ovate, 0.15–0.3 mm. Petals white or purplish-red, obovate, ca. 1.2 mm. Anthers dark purple. Stylodium short-conic. Fruit broadly ovoid, 2.5 × 1.5 mm, sparsely pimpled, ribs prominent, narrowly sinuolate-winged, dark purple-black; vittae large, 1 per furrow, 2 on commissure. Fl. Jul–Sep, fr. Oct–Nov.

Dwarf Rhododendron scrub, marshy meadows; (2600–)3500–4600 m. SE Xizang, NW Yunnan.

This is an enigmatic species, rarely collected in fruit, and is here retained within Pleurospermum (on account of the white scarios mar-

丽江棱子芹 *yi jiang leng zi qin*

*Hymenium foetens* (Franchet) Pimenov & Kljuykov; *Pleurospermum dielsianum* Fedde ex H. Wolff, p.p.

Plants dwarf, 8–20 cm, often tinged purple-red. Root gray-brown, conic, 1–1.5 cm thick. Stem strongly reduced, 3–5 cm. Petioles short, flattened, winged, 3–5 cm, sheaths oblong; blades ovate-lanceolate, 4–6 × 1.5–2.5 cm, 3–4-pinnate; pinnate 5 pairs, petiolulate; ultimate segments linear-lanceolate, 1–2.5 × 0.5–1.5 mm, midrib channelled. Umbels usually almost sessile (sometimes pedunculate in mesic conditions), 15–18 cm across; bracts few, leaf-like; rays stout, 15–25, 3–15 cm, very unequal, ribbed; bracteoles 12–14, ovalate, 5–12 mm, just longer than flowers, apex pinnate, pedicels numerous, 0.5–1 cm, narrowly winged/ribbed. Calyx teeth minute, ca. 0.2 mm, ovate. Petals oblanceolate, white or greenish-white. Stylopodium short-conic. Fruit dark brown, ovoid-oblong, 8–10 × 4–6 mm; ribs all narrowly winged; vittae 1 in each furrow, 2 on commissure. Fl. Jul.–Aug. fr. Sep.–Oct.

- Alpine grasslands; 4000–4600 m. SW Sichuan.


心叶棱子芹 *xin ye leng zi qin*


Plants 50–100(–150) cm. Root stout, dark brown, 1–2 cm across, aroma strong, like that of *Angelica* or *Apios*. Stem to 1 cm thick at base, thinly ribbed, branching. Basal petioles 7–16 cm; sheaths oblong; blades 1–2-ternate/pinnate; ultimate segments broadly ovate, 5–11 × 4–8 cm, setose along nerves, regular-serrate, apex acute to acuminate, base cordate. Stem leaves gradually reduced upwards; uppermost with inflated, often bladeless sheaths. Umbels 8–10 cm across; peduncle 15–25 cm; bracts 3–4, linear-lanceolate, 2–4 × 0.2–0.4 cm; rays 15–20, 4–7 cm, scabrous; bracteoles 6–8, linear-lanceolate, 1–2.5 cm, greenish-white with dark green median stripe.; pedicels 14–20, 8–10 mm. Calyx teeth inconspicuous. Petals greenish-white, obcordate, ca. 3 mm. Stylopodium conic. Fruit dark brown, ovoid-oblong, 8–10 × 4–6 mm; ribs all narrowly winged; vittae 1 in each furrow, 2 on commissure. Fl. Aug. fr. Aug–Sep. 2n = 22*.

- Damp grasslands, gravelly stream banks, frequently collected; 3100–4000 m. NW Yunnan.

This species is used in Yunnan as a regional substitute for the medicine “qiang huo” (*Notopterygium franchetii* and *N. incisum*).


圆叶棱子芹 *yuan ye leng zi qin*

*Hymenolaena rotundata* de Candolle, Prodr. 4: 245. 1830; *Pterocyclus rotundatus* (de Candolle) Pimenov & Kljuykov.

Plants (30–)50–60(–80) cm. Root brown, long-cylindric, ca. 1.5 cm thick, unbranched. Stem purple-green, thinly ribbed, base covered by remnant fibrous sheaths. Basal petioles 5–15 cm; sheaths broadly ovate; blades broadly ovate, 12–20 × 10–15 cm, 1–2-ternate; ultimate segments petiolulate, broadly ovate to orbicular, 3–8 × 2.5–8.5 cm, simple or 3-lobed, margin cuspidate crenate-dentate. Stem leaves few, tripartite. Umbels 2–4 cm across; peduncles 15–29 cm, thinly ribbed; bracts absent or 1–2, long-lanceolate, scarious, 0.5–2 cm, apex long-cuspidate; rays 6–8(–15), 0.6–2 cm, about as long as bracts; bracteoles 5–8, lanceolate, about as long as flowers; umbellules 8–12-flowered; pedicels unequal, 5–10 mm. Calyx teeth ovate, minute, apex obtuse. Petals yellowish-green or purplish, obovate, clawed. Stylopodium conic. Fruit oblong, 7–8 × 3–4 mm; ribs narrowly winged; vittae 1–2 in each furrow, ca. 4 on commissure. Fl. & fr. Aug–Sep.

- Forest margins, roadsides; 3300–3800 m. S Xizang (Nyalam) [Nepal].


Plants (20–)60–150 cm. Robust. Taproot thick. Stem branched, scabrous or puberulent base with fibrous remnant
sheaths. Basal petioles slender, 3–8 cm, sheaths very narrow; blades oblong-ovate or triangular-ovate, 3–8 × 2–6 cm, 2-pinnate or ternate-pinnate; ultimate segments lanceolate, ovate or obovate, 5–20 × 2–5 mm, base winged, margin serrate to pinnatifid, usually scabrous. Leaves gradually reduced upwards. Umbels terminal and lateral, 8–15 cm across; peduncles 4–18 cm; bracts 5–8, lanceolate or oblong, 1–3 cm, like upper leaves, becoming reflexed; rays 15–35, 3–10 cm, about equal, thick, scaberulous; bracteoles 6–10, lanceolate or ovate-lanceolate, 5–12 mm, longer than flowers, reflexed, margin broad, white, scarious; umbellules 20–30-flowered; pedicels 7–12 mm, angled, scaberulous. Calyx teeth ovate, minute. Petals obovate, white or flushed pink, apex inflexed. Fruit oblong ovoid or gled, scaberulous. Calyx teeth obsolete. Petals obovate, white. Stylodium short-conic. Fruit oblong, 0.7–1 × 0.5–0.6 mm; ribs all broadly short-winged; vittae 2–3 in each furrow, 6–7 on commissure. Fl. Jul–Aug, fr. Aug–Sep.

- Near ditches in forests, open dwarf scrub, alpine meadows; 3800–4100 m. SW Sichuan, Xizang, NW Yunnan.

This species has reputed medicinal value.


归叶棱子芹 gui ye leng zi qin

Angelica forrestii Diels; Hymenolaena angelicoides Walllich ex de Candolle, Prodr. 4: 245. 1830; Pterocyclus angelicoides (Walllich ex de Candolle) Klotzsch; Pterocyclus forrestii (Diels) Pimenov & Kljuykov.

Plants 80–120 cm or more, robust. Root dark brown, long-conic, 3–4 cm across. Stem thinly ribbed, glabrous. Basal leaves with long petioles, 20–40 cm, sheath narrow-oblong, 4–5 cm; blades oblong, 3–4-ternate-pinnate; ultimate segments oblong or ovate-oblong, 4–10 × 2.5–4 cm, scabrous along nerves abaxially, cuneate, irregularly serrate or 3-lobed, apex acute. Stem leaves reduced upwards, sheaths strongly inflated and auriculate, membranous. Umbels 8–10 cm across, peduncle ca. 30 cm; bracts 5–8, linear-lanceolate, 2–3 × ca. 0.8 cm, apex caudate, deciduous; rays 15–25, 5–8 cm in flower, to 15 cm in fruit; bracteoles 5–8, narrow-lanceolate, 1–2 × 0.3–0.5 cm, membranous, green, margin sometimes pale; pedicels ca. 25, 1–1.5 cm. Calyx teeth obsolete. Petals ovate, white or tinged purplish-red, 2.2–2.75 × ca. 1.5 cm. Anthers dark purple. Fruit oblong, dark brown, 8–14 × 3–4 mm; dorsal ribs prominent, lateral ribs narrowly winged; vittae 1–2 in each furrow, 2–3 on commissure. Seed face concave. Fl. Jun–Aug, fr. Aug–Sep. 2n = 22*.

Stream banks in forests, alpine meadows; 3000–4000 m. SW Sichuan, SE Xizang, NW Yunnan [Bhutan, Kashmir, Myanmar, Nepal, Sikkim].


长果棱子芹 chang guo leng zi qin


Plants 80–100 cm. Stem ribbed, branched. Basal and lower petioles 10–30 cm; sheaths very broad, auriculate; blades broad-ovate in outline, 30–40 × 15–25 cm, 3–4-ternate-pinnate, pinnae long-petiolute, ultimate segments oblong-ovate to broad-ovate, 5–15 × 2.5–7 cm, oblique-cuneate, regular-crenate, apiculate, sparse-setose along nerves abaxially. Leaves reduced upwards; sheaths inflated, conspicuous. Umbel 8–10

Oreocomopsis aromatica (W. W. Smith) Pimenov & Kljuykov.
cm across; peduncle 10–15 cm; bracts 3–8, linear, 2–3.5 × 1–3 mm; rays 20–25, subequal, 5–8 cm in fruit, scabrous; bracteoles ca. 8, linear, 10–15 × ca. 1 mm, uniform green; pedicels numerous, 7–10 mm, flattened, slightly scabrous. Calyx teeth obsolete. Petals broad-ovate, white. Stylodipodium short-conic. Fruit narrow-oblong, dark brown, 10–15 × ca. 4 mm; ribs all narrowly winged; vitae 1 in each furrow; 2 on commissure. Seed face slightly concave. Fl. and fr. Jul–Sep.

- Near ditches in coniferous forests, shrubby thickets; ca. 3100 m. SE Xizang, NW Yunnan.

This incompletely known taxon is recorded only from a few collections. It is superficially similar to *Angelica*, and is closely related to *P. angelicoides*, from which it differs by its regularly crenate leaves, narrower bracts and bracteoles (less than 4 mm), and slightly concave seed face.


**Hymenidium heracleifolium** (Franchet ex H. de Boissieu) Pimenov & Kljuykov.

Plants 40–80 cm. Root dark brown, long-conic. Stem ribbed. Basal and lower petioles to 20 cm, flattened, membranously-winged, sheaths narrow-oblong; blades broadly triangular-ovate, 8–12 × 8–12 cm, 3–5-lobed or 2-ternatifid; ultimate segments ovate or narrow-ovate, 2–5 × 1–2.5 cm, irregular-serrulate. Acute, white-hispid abaxially and on adaxial veins, abaxial surface gray-green. Leaves reduced upwards. Umbels 10–15 cm across; peduncle 5–10 cm; bracts 7–9, oblong-ovate to obovate, 3–6 × 0.5–2 cm, white-hispidulous along nerves on both sides, apex entire or 3–5-lobed, margin coarse-dentate; rays 10–15, 2–4 cm, densely hispidulous; bracteoles 5–9, lanceolate, 1–2 cm, similar to bracts; pedicels 10–15, 8–15 mm, hispidulous, elongating in fruit to 20 mm. Calyx teeth obsolete. Petals elliptic, white, ca. 1.5 mm. Stylodipodium conic. Fruit oblong-ovoid, 7–10 × 1.8–2.5 mm; ribs all narrowly-winged; vitae 1 in each furrow; 2 on commissure. Fl. Jul–Sep, fr. Aug–Oct.

- Open dwarf scrub, grasslands; 3000–3900 m. Xizang, NW Yunnan.

This species is closely related to, and not always easy to distinguish from, *P. benthamii*. The presence of coarse, white hairs (reminiscent of those seen in *Heracleum*) on the leaf sheath and main veins is usually diagnostic, as is the gray-green underside of the leaves and the densely hispidulous rays and pedicels.


**Hymenidium macrochaenum** (K. T. Fu & Y. C. Ho) Pimenov & Kljuykov.

Plants 40–60 cm. Root stout conic. Stem ribbed and branch- ed. Basal and lower petioles 4–6 cm, flattened, membranously-winged, sheaths broad, oblong, membranous; blades broadly triangular-ovate, tripartite; median lobes ovate, 1.5–3 × ca. 1.5 cm, larger than narrowly ovate lateral lobes, serrate. Leaves reduced upwards, with petioles becoming wholly sheathing. Umbels ca. 10 cm across; bracts 7–10, oblong-ovate, 3–5 × ca. 1 cm, pilose along veins, apex 3–5-lobed; rays 10–25, 5–6 cm; bracteoles 6–8, elliptic-ovate, 1–1.5 × 0.3–0.5 cm, apex 3–5-lobed, median stripe green, margins white; pedicels numerous, ca. 8 mm. Calyx teeth obsolete. Petals broad-ovate or rounded, pinkish. Stylodipodium short-conic. Immature fruit ellipsoid; ribs all broadly sinuate-winged; vitae 1 in each furrow, 2 on commissure (mature fruit not known). Fl. Jun–Jul.

- Grassy slopes in mountains; ca. 3500 m. SW Xizang.

This incompletely known taxon is recorded only from the type gatherings. It is closely allied to *P. benthamii*.


**Hymenolaena franchetiana** Fedde ex H. Wolff; **P. pilgerianum** Fedde ex H. Wolff; **P. rockii** Fedde ex H. Wolff.

Plants 40–70 cm. Root conic, branched. Stem hollow, ribbed, base 5–12 mm thick. Basal and lower leaves long-petiolate, sheaths narrow-oblong; blades ovate, 7–18 × 5–15 cm, 3-ternate-pinnate; pinnae 5–7 pairs, proximal pinnae petiolulate; ultimate segments oblong-lanceolate, 10–25 × 2–5 mm, hirtellous along nerves and margins otherwise glabrous, irregularly incised. Leaves gradually reduced upwards. Terminal umbels fertile, 8–17 cm across, peduncle 2–4 cm, ovborted by the sterile lateral umbels (when present), pedicules to 14 cm; bracts 8–12, oblong-ovate to spatulate, 1.5–3 cm, broadly white-margined to the first lobes, apex 3–5-lobed; rays 12–28, 3.5–7 cm, unequal, smooth; bracteoles 8–10, oblong-elliptic to spatulate, 10–15 mm, apex entire or shortly 3-lobed; pedicels numerous, 6–10 mm. Calyx teeth obsolete. Petals obovate, white, ca. 1 mm. Anthers dark purple. Stylodipodium short-conic. Fruit oblong-ovoid, 4–6 × ca. 3 mm; dorsal ribs sinuate-winged, lateral ribs plane-winged; vitae 1 in each furrow, 2 on commissure. Fl. Jul–Aug, fr. Sep.

- Alpine grasslands, river banks; 2500–4300 m. Gansu, Hubei, Ningxia, Qinghai, Shaanxi, Sichuan.

This species is similar to, and sometimes treated as conspecific with, *Pleur Avengers davidii* (here a synonym of *P. benthamii*). It is here distinguished by the more finely divided leaves (ultimate segments to 5 mm wide), hirtellous along the margin, the smaller fruits (less than 6 mm), and the terminal umbel opnolated by the staminate lateral umbels. It has reputed medicinal value (in Sichuan).


**Hymenolaena benthamii** Wallich ex de Candolle, Prodr. 4: 246. 1830; **Hymenidium benthamii** (Wallich ex de Candolle) Pimenov & Kljuykov; **H. davidii** (Franchet) Pimenov & Kljuykov; **Pleurospermum davidii** Franchet.

Plants (25–)45–150 cm. Root cylindric, ca. 2.2 cm thick, annular ringed at apex. Stem hollow, thinly ribbed, base ca. 2 cm thick, often tinged purple. Basal and lower petioles 10–18 cm, sheaths narrow-oblong; blades broadly triangular-ovate, 8–15 cm, 2–3-ternate-pinnate, glabrous; pinnae 3–4 pairs, short-
petiolulate; ultimate segments narrow-ovate or lanceolate, 1–2.5 × 0.3–1 cm, base decurrent, serratate-pinnatifid. Umbels (5–)10–15 cm across; peduncle 4–12 cm; bracts 5–9, oblongate, 3–9 × 1–2 cm, margin white-scarious, apex pinnate; rays 10–25, 5–10 cm (in fruit), scabrous-ribbed; bracteoles 6–9, oblongate, 8–20 × 3–5 mm, margin white-scarious, apex 3-lobed, pedicels 15–20, 5–15 mm (to 35 mm in fruit), flattened, scabrous. Calyx teeth obsolete. Petals obovate, white, rarely pink, 2–3 mm, acute. Stylopodium conic. Fruit ovoid-ellipsoid, 6–10 × 2.5–4.5 mm; ribs all sinuolate-winged; vittae 1 in each furrow, 2 on commissure. Fl. Jun–Jul, fr. Aug–Sep.

Open scrub, alpine pastures, riversides; 2200–4300 m. W Sichuan, SE Xizang, NW Yunnan [Bhutan, N Myanmar, E Nepal, Sikkim].

This species has reputed medicinal value (in Yunnan).


异叶棱子芹 yi ye leng zi qin

Hymenidium decurrens (Franchet) Pimenov & Kljuykov.

Plants 40–100 cm high. Root dark brown, 7–10 cm across. Stem slender, 4–7 mm thick at base, ribbed. Basal and lower petioles 10–30 cm; sheaths oblong, membranous; blades broad-ovate, 5–12 cm, 2-ternate/pinnate, hirtellous along the main veins on both surfaces, otherwise glabrous; ultimate segments oblong-ovate, 1–3 × 0.8–2 cm, base cuneate-decurrent, pinnately incised distally. Stem leaves gradually reduced upwards. Umbels 6–10(–18) cm across; peduncles 5–13 cm; bracts 6–10, pale green, oblong-lanceolate, 1.2–2.2 × 0.4–1.2 cm, less than half length of rays, margin white membranous, apex acute or 3-lobed; rays 10–15(–20), 2–4.5 cm, scabrous; bracteoles 6–8, 7–15 mm, equal to flowers in size, linear-lanceolate, entire or occasionally 3-lobed; pedicels numerous. Calyx teeth obsolete. Petals ovate-lanceolate, white, ca. 2 mm. Anthers violet, filaments white. Stylopodium conic, cream. Fruit ovoid, 4–8 × 2.5–3.3 mm; ribs narrowly sinuolate-winged; vittae 3 in each furrow, 4 on commissure. Fl. Jul–Aug, fr. Aug–Sep.

Open scrub, high-altitude alpine turf, semi-stable screes; (3000–)4000–5100 m. SE Xizang, NW Yunnan [Bhutan, Sikkim].

The plants are used in traditional medicine in Xizang.


鸡冠棱子芹 ji guan leng zi qin

Hymenidium cristatum (H. de Boissieu) Pimenov & Kljuykov.

Plants 60–120 cm, glabrous. Root gray-brown, conic. Stem slender, hollow, simple or branched. Basal and lower leaves long-petiolate, sheaths ovate; blades broadly triangular-ovate, 15–28 × 10–14 cm, 2-ternate-pinnate; ultimate segments rhomboid-ovate, 1.5–6 × 0.8–2.8 cm, cuneate, irregular-incised or pinnate, acuminate. Leaves reduced upwards. Umbels 3–5 cm across; bracts 3–7, obovate-oblong, 1–2.5 cm, apex entire; rays 7–13, 1–2.5 cm, subequal; bracteoles 4–6, linear-lanceolate, 1–2.3 cm, almost as long as rays; pedicels 15–25, 3–5 mm. Calyx teeth obsolete. Petals ovate, white, ca. 1 mm. Stylopodium conic. Fruit ovoid, brownish, 3.5–5 × 3–4.5 mm, tuberculate; ribs all broadly cristate-keeled/narrowly winged; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Jul–Sep.

Forest margins, grasslands near ditches; 1000–2600 m. Anhui, Gansu, Henan, Hubei, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan.


美丽棱子芹 mei li leng zi qin

Hymenidium amabile (Craib & W. W. Smith) Pimenov & Kljuykov.

Plants 15–50 cm high. Root stout, dark brown, 1–1.5 cm across. Stem solitary, stout 1–2 cm broad, violet-green, unbranched. Basal petioles 3–6 cm, sheaths broad-ovate, 2–3 cm across; blades triangular-ovate, 6–15 cm, 3–4-ternate-pinnate; ultimate segments linear, 1–2 mm. Stem leaves gradually reduced upwards, sheaths greatly expanded, 3–5 cm broad, very pale almost white, nerves tinged purple, membranous, margins erose. Umbel 5–12 cm across, usually solitary; peduncles 2.5–4 cm; bracts 3–8, 3–5 cm, similar to upper leaves; rays 20–30, 2–4 cm, subequal; bracteoles ca. 12, oblong or oblongate, 6–10 × 4–8 mm, membranous, silvery white, main veins dark purple; pedicels 20–25, ca. 5 mm. Calyx teeth obsolete. Petals orbiculate, white to dark purple, 1–1.5 mm. Anthers dark purple. Stylopodium depressed, purple-black; style yellow-green. Fruit ovoid-oblong, 3–5 × ca. 1.5 mm; ribs very narrowly sinuolate-winged; vittae 3 in each furrow, 4–6 on commissure. Fl. Jul–Sep, fr. Sep–Oct.

Open scrub, alpine pastures, riversides; 2200–4300 m. W Sichuan, SE Xizang, NW Yunnan [Bhutan, Sikkim].

The plants are used in traditional medicine in Xizang.


二色棱子芹 er se leng zi qin


Plants 10–40 cm. Root long-conic, simple. Stem purple-green, often simple, ribbed. Basal and lower petioles 2–8 cm, sheaths narrowly oblong, membranous; blades oblong, 4–10 × 2–6 cm, 1-pinnate to 2-pinnatifid; pinnae 4–5 pairs, only basal pinnae shortly petiolulate; ultimate segments oblong, 1.2–2.5 cm, serrate to pinnatifid. Stem leaves gradually reduced upwards. Umbels terminal, 5–9 cm across; bracts 3–8, narrowly obovate, 1.5–2.5 cm; rays 2–4, 1.5–3.5 cm, unequal; bracteoles 6–8, broadly ovate, 7–12 × 6–8 mm, median stripe broad, purple-green, margin broad white-membranous, apex 1–3-lobed, slightly exceeding flowers; pedicels ca. 2 mm. Calyx teeth narrowly triangular, ca. 1 mm. Petals white, purple-red distally, apex rounded. Anthers dark purple. Stylopodium dark purple. Fruit narrowly obovate, 2.5–3 × 1.8–2 mm; ribs sinuolate-winged; vittae 2 in each furrow, 4 on commissure. Fl. Aug–Sep, fr. Sep–Oct.

Open mixed woodlands, dwarf Rhododendron scrub, alpine pastures; 3500–4300 m. SW Sichuan, SE Xizang, NW Yunnan.
This species is similar to, and sometimes confused with, the Himalayan unspecific genus *Pleurospermopsis*.


云南棱子芹 yun nan leng zi qin

*Hymenidium yunnanense* (Franchet) Pimenov & Kljuykov; *Pleurospermum pseudoyunnanense* H. Wolff.

Plants 30–60(–100) cm. Taproot stout, dark brown. Stem hollow, distally ribbed and branched. Basal and lower petioles up to 20 cm; sheaths broad obovate, extended to first pinnae in mid and upper leaves, puberulous along veins; blades broadly triangular-ovate, 10–20 cm, 2–3-ternate/pinnate, glabrous; ultimate segments ovate or obovate, 1–2.8 × 0.5–2 cm, acutely serrate to lacerate. Umbels 7–10(–15) cm across; peduncles 7–12 cm; bracts 6–8, obovate to broadly lanceolate, 2–1 × 1 cm, divided at apex; rays 12–25, 3–5 cm, brown-hirtellous along ribs; bracteoles 6–10, obovate-oblong, 10–15 mm, membranous except midribs, cuneate, 3–5-lobe to pinnatilobed at apex; pedicels numerous, 6–8 mm in fruit. Calyx teeth conspicuous, lanceolate-triangular, ca. 0.5 mm. Petals obovate, greenish-white, occasionally flushed pink. Anthers dark purple-black. Fruit broadly ovoid, 3–4 × 2.5–3.2 mm; ribs narrowly winged; vittae 2 in each furrow, 4 on commissure. Fl. Jun–Aug. Fr. Aug-Oct.

Woodland margins, dwarf *Rhododendron* scrub, valley sides, rocky slopes; 3600–4100 m. W Sichuan, NW Yunnan [NE Myanmar].


疏毛棱子芹 shu mao leng zi qin

*Hymenidium pilosum* (C. B. Clarke ex H. Wolff) Pimenov & Kljuykov.

Plants 20–40 cm, white-setose throughout. Root stout, branching. Stem ribbed, lower parts purple-red. Stem leaves petiolate, petioles ca. 10 cm; sheaths broadly ovate, 2.5–4 cm, purple-red adaxially, densely white-setose abaxially; blades triangular-oblong, 10–15 × 5–7 cm, 3-pinnate; pinnae 5–7 pairs, only basal pinnae short-petiolulate; ultimate segments obovate or oblanctellate, 3–5 × 2–3 mm, setose along nerves abaxially, entire or 2–3 toothed, cuspidate at apex. Umbels 3–15(–20) cm across (in fruit); bracts 1–3, 1–3 cm, white-setose abaxially, apex acute or pinnate; rays 6–17, 8–10 cm; bracteoles 8–10, broadly cuneate-obovate, 6–15 mm, mottled purple-green, pubescent along nerves, abruptly acuminate to a short point; umbellules many-flowered. Calyx teeth obsolete. Petals obcordate, white, often purplish on reverse, ca. 2 × 1.2 mm. Fruit oblong, 3–6 × 1.5–2 cm; ribs narrowly winged; vittae 1 in each furrow, 2 on commissure. Fl. Jul–Aug. Fr. Sep–Nov.

Damp meadows, streamsides; ca. 4100 m. S Xizang (Yadong) [Bhutan, Sikkim].

This species has reputed medicinal use.


白色棱子芹 bai bao leng zi qin

*Hymenidium album* (C. B. Clarke ex H. Wolff) Pimenov & Kljuykov.

Plants 16–40(–70) cm, essentially glabrous. Stem solitary, 5–8 mm across at base, little branched. Lower petioles flattened; sheaths ovate, white-margined; blades broadly rhomboid, 3–4-ternate/pinnate; pinnae 6–8 pairs remote, proximal pinnae long-petiolulate; leaflets broadly ovate, 8–10 mm, pinnatifid; ultimate segments 2–3-toothed. Stem leaves reduced upwards, sheaths greatly inflated, broadly white-margined. Umbels 3.5–13 cm across; bracts 5–6, broadly obovate, 2–3.5 × 0.8–1.5 cm, scabrous along nerves, apex slightly pinnate; rays 8–10, unequal, ca. 1.5 cm in flower, extending to 7 cm in fruit; bracteoles numerous, broadly cuneate, ca. 10 × 6 mm, unequal, exceeding umbellules, margin bore silver-white, apex acuminate or trifid, margin irregularly serratulate; umbellules 12–20 mm across. Calyx teeth linear-lanceolate, 0.5–0.75 mm. Petals white, yellowish or greenish, obovate to obovate, unequal. Anthers dark purple-black. Style dark violet. Mature fruit not known. Fl. and fr. Jul–Sep.

Open wet grasslands, streamsides; 3900–4900 m. S Xizang (Yadong) [Bhutan, Nepal, Sikkim].


单茎棱子芹 dan jing leng zi qin

*Aulacospermum simplex* Ruprecht in Osten-Saken & Ruprecht, Sert. Tianschan. 49. 1869; *Albertia commutata* Regel & Schmalhausen; *Trachydium commutatum* (Regel & Schmalhausen) M. Hiroe.

Plants 20–40 cm, glabrous. Stem solitary, ribbed, branch- ed. Basal and lower petioles 8–15 cm, flattened, sheaths narrow-oblong, 3–5 cm broad; blades ovate or obovate-oblong, 4–7 × 1.5–3.5 cm, 2–3-ternate/pinnate; pinnae 4–6 pairs, sessile; ultimate segments linear-lanceolate, 4–18 × 1–4 mm, acute. Leaves gradually reduced upwards. Umbels 5–7 cm across; bracts 4–7, lanceolate, 1–1.5 cm; rays 5–11, 1–5 cm, very unequal; bracteoles 5, 5–8 mm, lanceolate, pale green, apex entire acute, pedicels 7–16, 2–5 cm. Calyx teeth conspicuous, broad-triangular. Petals broad-ovate, purplish, margin white. Anthers yellow-green. Stylopodium green, short-conic. Fruit broad-ovoid or subglobose, 3–4 × 2.5–3.5 mm; ribs all broadly sinuate-winged; vittae 1 in each furrow, 2 on commissure. Fl. Jul, fr. Aug.

Grasslands in mountains; ca. 2500 m. NW Xinjiang [Turkmenistan].


岩生棱子芹 yan sheng leng zi qin


Plants 20–50 cm, glabrous. Root conic. Stem simple or little-branched. Basal and lower petioles 8–18 cm, flattened, sheaths narrow-oblong; blades ovate, 3–5 × 1.5–3 cm, 2–3-
P. lecomteanum

× mm; ribs all broadly sinuolate-winged; vittae 3 in each furrow, 6 on commissure. Fl. Jul, fr. Aug.

‐ Rocky mountain slopes; 2500–3500 m. NW Xinjiang [Turkmenistan].

This rather poorly known taxon is possibly conspecific with Pleurospermum simplex.


喜马拉雅棱子芹 xi ma la ya leng zi qin

Hymenidium szechuenii (Kanitz) Pimenov & Kljuykov; Pleurospermum dielsianum Fedde ex H. Wolff, p.p.

Plants 15–40 cm. Root dark brown, conic. Stem stout, simple or branched, base with papery remnant sheaths. Basal and lower leaves long-petiolate, petioles flattened, sheaths narrowly oblong; blades ovate or lanceolate, 5–8 × 2–4 cm, 2–3-ternate-pinnate; pinnae 6–9 pairs, sessile; ultimate segments lanceolate, 2–3 × ca. 1 mm, acute. Leaves gradually reduced upwards. Umbels 10–15 cm across; bracts 7–11, oblanceolate, 1.5–4 cm, apex 2-pinnate, margin broadly white-membranous; rays 7–15, 2–4 cm, subequal; bracteoles 6–10, ca. 5 mm, similar to bracts, pedicels numerous, ca. 5 mm, flattened. Calyx teeth narrowly triangular, ca. 1 mm. Petals rounded, 1–1.2 mm, white. Anthers dark purple. Fruit oblong-ovoid, 5–6 × 3–4 mm; ribs all broadly crisped-winged; vittae 1 in each furrow, 2 on commissure. Fl. Jul, fr. Aug.

‐ High-altitude grasslands; 3700–4200 m. N Gansu, E Qinghai, E Xizang.


粗茎棱子芹 cu jing leng zi qin

Hymenidium wilsonii (H. de Boissieu) Pimenov & Kljuykov; Physospermopsis lalabdariana Farille & S. B. Malla; Pleurospermum erniditifolium H. Wolff; P. crassicaule H. Wolff; P. lecomteanum H. Wolff; P. tamaricetifolium H. Wolff; P. thalictrifolium H. Wolff

Plants 10–40 cm, glabrous. Root dark brown, 4–6 mm across. Stem ribbed. Basal and lower petioles 3–8 cm, sheaths narrowly oblong, membranous margin; blades triangular-ovate, 5–13 cm, 3–4-ternate-pinnate; pinnae 7–9 pairs, ovate-lanceolate, 3–5 × 1.5–2.5 cm; ultimate segments linear, ca. 2 mm. Leaves gradually reduced upwards, petioles becoming wholly sheathing. Umbels 5–7 cm across; peduncles 6–12 cm; bracts 5–7, ovate-lanceolate or linear-lanceolate, 1.5–2.5 cm, margin membranous, white or tinged brown, apex long-caudate or occasionally pinnatifid; rays 6–12, 2–4 cm, subequal, ribbed; bracteoles 6–10, ca. 5 mm, similar to bracts, pedicels numerous, ca. 5 mm, flattened. Calyx teeth narrowly triangular, ca. 1 mm. Petals rounded, 1–1.2 mm, white. Anthers dark purple. Fruit obvoid, 3–4 mm; ribs narrowly winged; vittae 3 in each furrow, 6 on commissure. Fl. and fr. Aug.–Oct.

‐ Open pastures by streams, grassy slopes; 2700–5400 m. Gansu, Qinghai, Sichuan, SE Xizang, NW Yunnan [Bhutan, Nepal, Sikkim].

This highly variable and complex taxon is wide-ranging in distribution and leaf form across the Himalayan region and SW China. Two varieties are currently recorded from China, but further revision of the taxa, together with P. giraldii and P. tsekuense, is needed.

1a. Bracteoles ovate-lanceolate, margin broad, white, apex long-caudate ............. 32a. var. hookeri

1b. Bracteoles linear-lanceolate, margin narrow, tinged brown, apex pinnatifid ............. 32b. var. thomsonii

32a. Pleurospermum hookeri var. hookeri

喜马拉雅棱子芹(原变种) xi ma la ya leng zi qin (yu an bian zhong)

Aulacospermum hookeri (C. B. Clarke) Farille & S. B. Malla; Hymenidium hookeri (C. B. Clarke) Pimenov & Kljuykov; Pleurospermum wolfianum Fedde ex H. Wolff.

Bracteoles ovate-lanceolate, margin broad, white, apex long-caudate.

‐ Open pastures by streams; 4100–5400 m. SE Xizang, NW Yunnan [Bhutan, Nepal, Sikkim].

32b. Pleurospermum hookerii var. thomsonii

喜马拉雅棱子芹 xi zang leng zi qin

Hymenidium chloroleucum (Diels) Pimenov & Kljuykov; Pleurospermum affine H. Wolff; P. likiangense H. Wolff (1930), not H. Wolff (1929); P. markgrafianum H. Wolff; P. pseudoinvolucratum H. Wolff; P. tibetanicum H. Wolff; Trachydium chloroleucum Diels.
Bracteoles linear-lanceolate, margin narrow, tinged brown, apex usually pinnatifid.

- Grassy slopes; 2700–4500 m. Gansu, Qinghai, Sichuan, SE Xizang, NW Yunnan.

This variety has reputed medicinal value (in Xizang). Some authors consider *Hymenidium* (Trachydium) chloroleucum (including *Pleurospermum liliangense*) to be a separate taxon, differentiated by the less dissected leaflets and bracteoles with a pinnate apex. Further work is needed on this complex group.


泽库棱子芹  ze ku leng zi qin

*Hymenidium tsekunense* (R. H. Shan) Pimenov & Kljuykov.

Plants 30–50 cm, glabrous. Root stout, ribbed and branching. Basal and lower petioles 5–8 cm, sheaths ovate; blades broadly triangular, 6–10 × ca. 8 cm, 3–4-ternate-pinnate; petiolules of proximal pinnas 1.5–2 cm; ultimate segments linear-lanceolate, 3.5 × ca. 1 mm. Leaves gradually reduced upwards with short or wholly sheathing petioles. Umbels 4–6 cm across; bracts 3–5, lanceolate, 1.5–2.5 cm, apex pinnate; rays 7–10, 2.5–4 cm, subequal; bracteoles 8–10, narrow-lanceolate, 0.6–1 cm, apex pinnate/pinnatifid; pedicels ca. 5 mm, flattened. Calyx teeth conspicuous, ovate, dark purple, ca. 0.3 mm. Petals broadly-ovate or rounded, purplish to white, ca. 1 mm. Anthers black-purple. Stylodium black-purple, long-conic. Immature fruit ovoid, narrow-winged (mature fruit unknown). Fl. and fr. Jul–Sep.

- Grassy slopes; 3400–3500 m. Qinghai.

This incompletely known taxon is recorded only from a few collections and is part of the *Pleurospermum hookeri* complex.


太白棱子芹 tai hai leng zi qin

*Hymenidium giraldii* (Diels) Pimenov & Kljuykov; *Pleurospermum limprichtii* H. Wolff; *P. meoides* Diels.

Plants 20–35 cm, glabrous. Root dark brown, 0.5–1 cm across, branched. Stem tinged purple, ribbed, simple or little branched. Basal and lower leaves long-petiolate, sheaths membranous; blades triangular-ovate, 5–8 cm, 3–4-ternate-pinnate; ultimate segments linear, 1.5–3 × 0.3–0.5 mm. Leaves gradually reduced upwards, petioles becoming almost wholly sheathing. Umbel often 1, rarely 2–3, 3.5–4.5 cm across; bracts 5–7, ovate-elliptic or obovate, 15–20 × 5–8 mm, white or tinged purple, membranous; rays 9–15, 1.5–2.5 cm; bracteoles 5–7, obovate, longer than flowers, margin white membranous to first lobes, apex pinnatisect; pedicels 18–30, 2.5–3.5 mm. Calyx teeth minute, triangular. Petals obcordate, white, ca. 1 mm. Stamens longer than petals, anthers purple-black. Fruit oblong, 3.5–4 mm; ribs winged; vitiae 3 in each furrow, 6 on commissure. Fl. Jul–Aug. fr. Sep–Oct.

- Grassy mountain slopes; 3000–3600 m. Gansu, Hubei, Shaanxi, Sichuan.

This taxonomic boundaries between this species and *Pleurospermum hookeri* var. thomsonii are unclear as the character of obsolete calyx teeth is not reliable and the degree of dissection of the bracteoles is somewhat variable. All parts of the plant are used medicinally to cure stomach ache (in Shaanxi).


紫色棱子芹 zi se leng zi qin

*Hymenidium apiolens* (C. B. Clarke) Pimenov & Kljuykov; *Pleurospermum apiolens* var. nipaulense Farille & S. B. Malla; *P. atropurpureum* K. T. Fu & Y. C. Ho.

Plants 30–40 cm. Stem ribbed, branched, lower parts dark purple-red. Basal and lower petioles 10–12 cm, sheaths narrow-oblong; blades oblong-ovate, 10–15 cm, 2-ternate-pinnate; pinnas 5–6 pairs, petiolulate; ultimate segments ovate to obovate, 1–2 × 0.5–1 cm, cuneate, incised-dentate. Leaves gradually reduced upwards. Umbels ca. 7 cm across; bracts 3–6, oblong-ovate, 1–2 × ca. 0.5 cm, margin purple-red, serrate, apex cuspidate; rays 5–7, ca. 3 cm, subequal, scabrous-ribbed; bracteoles 6–10, ovate to broad-ovate, ca. 10 × 4–6 mm, longer than flowers, similar to bracts; pedicels numerous, ca. 4 mm. Calyx teeth obsolete. Petals broad-ovate, white. Stylodium short-conic. Fruit oblong, 3.5–5 × 2–3 mm; ribs all broadly sinuate-winged; vitiae 1 in each furrow, 2 on commissure. Fl. and fr. Jul–Sep.

- High-altitude grassy slopes; 3800–4700 m. SW Xizang [Bhutan, Nepal, Sikkim].


高山棱子芹 gao shan leng zi qin

*Physospermopsis handelii* (H. Wolff) Pimenov & Kljuykov.

Plants 30–45 cm, slender, glabrous. Taproot stout. Stem branched, branches often opposite or cyclic. Basal petioles ca. 15 cm; sheaths narrow, 1–2 cm; blades triangular-lanceolate, 6–8 × ca. 2.5 cm, 3-pinnate; pinnas 5–6 pairs, broadly triangular, petiolules ca. 3 mm; ultimate segments shortly petiolulate or sessile, pinnatifid, colored-mucronate. Stem leaves gradually reduced upwards. Terminal umbel, peduncle 10–15 cm, often exceeding by the lateral umbels; bracts 5–10, obovate-lanceolate, 2–4.5 cm, leaf-like; rays slender, 6–12 cm, unequal; bracteoles rhomboid, about equaling the flowers, apex pinnate; pedicels 15–30, up to 10 mm, unequal. Calyx teeth minute. Petals white, rounded, ca. 1 mm. Anthers dark purple. Young fruit broad-ovoid, sparsely tuberculate; ribs narrowly sinuate-winged (mature fruit not known). Fl. Aug, fr. Sep.

- Alpine meadows; 2900–4100 m. NW Yunnan [NE Myanmar].

This incompletely known and problematic species is recorded only from a few collections (none bearing mature fruit). It is possibly better placed in *Physospermopsis* on account of the fibrous stem base, long slender rays, and green young fruit, but is here retained in *Pleurospermum* pending further research.


线裂棱子芹 xian lie leng zi qin
**Hymenidium linearilobum** (W. W. Smith) Pimenov & Kljuykov.

Plants 30–60 cm. Root dark brown, conic, ca. 2.5 cm thick. Stem thinly ribbed, glabrous. Basal and lower petioles 8–12 cm, sheaths small, narrow; blades oblong-ovate, 6–13 × 4–8 cm, 3–4-pinnate; ultimate segments linear, 3–6 × 0.5–1 mm, acute. Leaves reduced upwards, petiole becoming entirely sheathing. Umbels 10–18 cm across; peduncle 8–15 cm; bracts 7–10, 3–4 cm, like upper leaves; rays 20–25, 5–9 cm, unequal, hispidulous; bracteoles 6–8, lanceolate to oblanceolate, 5–10 mm, green with narrow white margin, apex entire or pinnate; pedicels 10–20, 8–10 mm, hispidulous. Calyx teeth obsolete. Petals obovate, white. Anthers dark purple. Stylodium short-conic. Fruit ovoid, 4–5 × 3.5–4.5 mm; ribs all broadly sinuate-winged; vittae 1 in each furrow, 2 on commissure. Fl. Jun–Jul.

● Mixed woodland margins, open low scrub, rocky slopes, scree; 2400–3000 m. W Sichuan, NW Yunnan.


疣果棱子芹 you ye leng zi qin

Plants 20–30 cm. Taproot brown, conic. Stem stout, purplish-tinged, glabrous or tuberculate at nodes. Lower petioles 4–9 cm, flattened, tuberculate; sheaths oblong; blades triangular-ovate, 6–9 cm, 3–4-pinnate/pinnate, rachis tuberculate; pinnae 5–6-paired, shortly petiolulate; ultimate segments ovate, 3–5 × 2.5–4 mm, 3–5-lobed, tuberculate along nerves abaxially. Stem leaves reduced upwards; peduncles ca. 4 cm; bracts 5–6, leaf-like, 4–6 cm, 1–2 pinnate at apex; rays 10–15, 4–7 cm, unequal, slightly scabrous; bracteoles ca. 10, broadly lanceolate, 1 cm, entire or apex pinnate, green with narrow white margin; pedicels numerous, 5–6 mm. Calyx teeth obsolete. Petals pinkish-white, oblong-oblanceolate. Ovary tuberculate along ribs; stylodium conic. Fruit unknown. Fl. Jun–Jul.

● Alpine grasslands; 3200–4200 m. NW Yunnan (Lijiang).

This incompletely known taxon is recorded only from the type gathering. It is possibly conspecific with **Hymenidium linearilobum**.


瘤果棱子芹 liu guo leng zi qin

**Hymenidium wrightianum** (H. de Boissieu) Pimenov & Kljuykov; **Pleurospermum prattii** H. Wolff.

Plants (15–)30–60 cm, tuberculate. Root brown, 1–2 cm thick. Stem tinged purple-red, ribbed and branched. Basal and proximal petioles 5–8 cm, flattened, winged, sheaths narrow, oblong; blades narrowly oblong-ovate, 4–9 × 2.5–5 cm, 2–3-pinnate/pinnate; pinnae 5–7 pairs, proximal pinnae petiolulate; ultimate segments linear-lanceolate, 3–5 × 0.5–1 mm, acute. Umbels 15–20 cm across; peduncle 2–3 cm; bracts 7–9, linear-lanceolate, 2–3 cm, apex pinnatifid, deciduous; rays 10–20, 3–10 cm (10–13 cm in fruit), very unequal; bracteoles ca. 10, oblong-lanceolate, 7–15 × 3–7 mm, apex pinnate; pedicels 10–15, 5–12 mm. Calyx teeth minute, triangular. Petals obovate, white or purplish-reddish. Stylodium short-conic. Fruit narrowly elliptic-ovoid, 5–6 × 2.5–3.2 mm, usually tuberculate; ribs all broadly cristate-winged; vittae 1 in each furrow, 2 on commissure. Fl. Jul–Aug. fr. Sep–Oct.

● Alpine grasslands; 3600–4600 m. SE Qinghai, SW Sichuan, SE Xizang, NW Yunnan.

The following species have been described from Chinese material, but are imperfectly known as no specimens have been seen or the specimens are inadequate.

**Hymenidium pachycladum** Pimenov & Kljuykov (Edinburgh J. Bot. 53: 275. 1996), described from NW Gansu (“Lienhuo Shan,” J. F. C. Rock 12703, holotype, E; isotype, NAS). It is possibly referable to **Pleurospermum**, but further research is required.

**Pleurospermum albinosum** H. Wolff (Repert. Spec. Nov. Regni Veg. 21: 243. 1925), described from W Sichuan (“Tatsienlu” [Kangding, holo type, P]). It has possible affinities with **P. benthamii**.

**Pleurospermum gracilifolium** H. Wolff (Repert. Spec. Nov. Regni Veg. 21: 244. 1925), described from W Sichuan (“Tatsienlu” [Kang ding], J. A. Soulé 2182, holotype, P). It has possible affinities with **P. benthamii**.


**Pleurospermum soulei** H. Wolff (Repert. Spec. Nov. Regni Veg. 19: 309. 1924), described from W Sichuan (Kangding, J. A. Soulé 2196, holotype, P).


簇苞芹属 cu bao qin shu

Pan Zehui (潘泽惠); Mark F. Watson

Herbs biennial or perennial, aromatic when crushed. Taproot stout. Stems stout, erect, solitary, sparingly branched above, bases clothed with papery remnant sheaths. Leaves mostly basal, petiolate; petiole abruptly and broadly sheathing at base; blade pinnate, stiffly subcoriaceous; pinnae ovate or suborbicular, margin coarse-serrate, sub sessile. Umbels compound, terminal and lateral; bracts several, obovate, lobed, stiffly papery, apex coarsely toothed; rays few, short; umbellules crowded; bracteoles prominent, similar to bracts, rigid, longer than and fringing the flowers, persistent and remaining spreading after fruiting. Calyx teeth small, triangular-acute, persistent in fruit. Petals broadly oblong-ovate, deep red-purple or purple-black, apex shortly incurved. Stylodium flattened; styles slightly longer than stylodium. Fruit narrowly oblong, slightly compressed laterally, glabrous; ribs prominent, narrowly winged; vittae 1–2 in each furrow, 4 on commissure. Seed face concave. Carpophore 2-parted.

One species: high-altitudes in Bhutan, China, E Nepal, and Sikkim.

簇苞芹 cu bao qin


Plants 10–50 cm, essentially glabrous (sometimes scabrescent at base of umbels, rays and around nodes). Stem base ca. 1 cm thick. Petioles slender, 2.5–15 cm, sheathing for most of it. Umbels 4–15 (–25) cm across; bracts 4–6, 2.5–3.5 cm, green; rays 4–7, (1.5–)4–13 cm, stout, to 3 mm thick; umbellules 2–4 mm across; bracteoles numerous, 1–16 × 4–8 mm, 3-lobed, lobes toothed, acute; pedicels 1–3 mm. Calyx teeth purple-black, ca. 0.5 mm. Fruit 3–4.5 × 1.5–2 mm green, apex blackened. Fl. and fr. Jan–Sep (–Oct).

Alpine turf, among rocks and dwarf shrubs, semi-stable screes; ca. 4000 m. S Xizang (Yadong) [Bhutan, E Nepal, Sikkim].

This species is morphologically similar to Pleurospermum bicolor and is possibly closely related.

25. VICATIA de Candolle, Prodr. 4: 243. 1830.

凹乳芹属 ao ru qin shu

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

Herbs perennial. Taproot stout, short, sometimes branched. Stem single or 2–3, erect, branched above. Leaves petiolate, sheathing; blade triangular, ternate-2–3-pinnate, or 1–2-pinnate. Umbels compound, terminal on stem and branches; bracts few or absent; rays unequal; bracteoles several, entire; umbellules 8–20-flowered. Calyx teeth obsolete. Petals ovate or obovate, white or flushed purple, apex narrow inflexed, base clawed or cuneate. Stylodium long conic or depressed; styles short, recurved. Fruit ovoid or oblong-ovoid, slightly laterally compressed, smooth; ribs filiform; vittae (1–)3–4–(5) in each furrow, (1–)4–6–(8) on commissure. Seed face deeply concave or sulcate. Carpophore 2-parted, sometimes to base.

About five species: Sino-Himalayan region, from Afghanistan to SW China; three species (one endemic) in China.

This is a taxonomically problematic genus; see comments under Carum and Tongoloa.

1a. Leaves ternate-2-pinnate, leaflets serrate; ultimate segments ovate, 2–3 cm broad; rachis minutely scabrous ........ 1. V. bipinnata

1b. Leaves ternate-2–3-pinnate, leaflets finely dissected; ultimate segments oblong-ovate or linear to lanceolate, less than 1 cm broad; rachis glabrous.

2a. Leaves abaxially minutely scabrous on main veins; bracteoles subulate, shorter than the pedicels; short male umbellules absent at base of fruiting umbel ................................................................. 2. V. thibetica

2b. Leaves glabrous on both surfaces; bracteoles linear, longer than the pedicels; rays of male umbellules not elongating after flowering, clustered at base of fruiting umbel ................................................................. 3. V. conifolia


少裂凹乳芹 shao lie ao ru qin


Plants to 1.5 m. Stems minutely pubescent to glabrous. Basal leaves petiolate, 10–20 cm, sheaths narrow; blade ternate-2-pinnate; primary pinnae 3–4 pairs, leaflets serrate; ultimate segments ovate, broad, 2–3 × 1–1.5 cm, serrate. Leaves reduced upwards, uppermost small, petiole sheathing for most of its length, blade 3-lobed. Umbels 5–15 cm across; bracts absent; rays 5–20, 1.5–8 cm, somewhat unequal, finely pubescent; umbellules ca. 1.5 cm across; bracteoles absent, or occasionally 2–5, linear, 4–8 mm. Petal base cuneate. Fruit oblong-ovoid, 4–5 × ca. 3 mm; ribs prominent, ridged; vittae 3–5 in each furrow, 8 on commissure. Seed face deeply concave. Fl. May–Jun, fr. Jul–Aug.

● Forest margins, grasslands, shady slopes; ca. 2700 m. NW Sichuan, SE and W Yunnan.


西藏凹乳芹 xi zang ao ru qin

Sinodielsia thibetica (H. de Boissieu) Klyuykov & P. K. Mukherjee.

Plants 20–80 cm, essentially glabrous (except base of umbels sparsely strigose). Leaves ternate-2–3-pinnate; primary pinnae 5–6 pairs, finely dissected, abaxially minutely scabrous on main veins; ultimate segments oblong-ovate, 5–15 × 2–8 mm, pinnatisect. Umbels 4–11 cm across; bracts 1, linear, or caducous; rays 8–10, 2–7 cm, unequal; umbellules 6–10 mm across; bracteoles 3–5, subulate, 3–5 mm, shorter than the pedicels; pedicels 1–4 mm, elongating to 8 mm in fruit. Petals white, occasionally flushed purplish-red, ca. 1.8 × 1 mm, base shortly clawed. Fruit ovoid-oblong, 2.5–4 × 1.5–2 mm, ribs filiform; vittae 3–4 in each furrow, 6 on commissure. Seed face deeply concave. Fl. Jun–Aug, fr. Aug–Sep.

Forests, among shrubs, riparian grasslands, rock crevices; 2000–4400(–5000) m. Qinghai, W Sichuan, E and S Xizang, Yunnan [Nepal].


凹乳芹 ao ru qin

Chaerophyllum gracilum Klotzsch; C. millefolium Klotzsch; Sphallerocarpus conifolius (Wallich ex de Candolle) Koso-Poljansky; S. millefolius (Klotzsch) Koso-Poljansky;

环根芹属 huan gen qin shu

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs perennial. Root woody; caudex usually stout-tuberous, aromatic. Stem hollow, terete, erect, often purplish, especially at base. Leaves 2–3-ternate-pinnate or pinnatisect; petiolate, sheaths membranous, clasping; ultimate segments oblanceolate or oblong-ovate.

- Two species.

1a. Stem smooth; ultimate leaf segments 4–20 × 2–6 mm; seed face deeply sulcate ................................................................. 1. **C. waltonii**

1b. Stem striate; ultimate leaf segments 20–60 × 3–10 mm; seed face deeply concave .......................................................... 2. **C. peucedanifolia**


环根芹 huan gen qin


Plants 16–100 cm. Roots 8–18 × 0.8–2 cm. Stem smooth, lower parts deep purple. Leaves triangular-ovate in outline, 8–25 × 6–20 cm; petioles 10–23 cm; ultimate segments linear or linear-elliptic, 1.5–3 × 0.8–3 mm, pinnatifid. Leaves reduced upwards. Umbels 2–4 cm across; bracts usually absent or 1–2, leaf-like; rays 6–12, unequal, 4–15 mm in flower, elongating to 3 cm in fruiting umbellules (remains of short male umbellules conspicuous at base of umbel); bracteoles 3–6, linear, 3–5 mm; as long or longer than the umbellules. Petals white to purplish-red, ca. 1.5 × 1 mm, base slightly clawed. Fruit obovoid-ovoid, 3.3–4 × 1–1.4 mm; ribs filiform; vittae (1–2)–4–5 in each furrow, 2–4–6 on commissure. Seed face deeply sulcate. Fl. May–Aug, fr. Jul–Sep.

Sparse alpine scrub, alpine meadows, grassy slopes, grassy stream banks; 3000–4700 m. Qinghai, W Sichuan, S Xizang, NW Yunnan [Afghanistan, Bhutan, India, Kashmir, Nepal, Pakistan, Sikkim].


羌活属 qiang huo shu

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs perennial. Root woody; caudex usually stout-tuberous, aromatic. Stem hollow, terete, erect, often purplish, especially at base. Leaves 2–3-ternate-pinnate or pinnatisect; petiolate, sheaths membranous, clasping; ultimate segments oblong or oblong-ovate.
Umbels loose compound, terminal and lateral; bracts few, deciduous; bracteoles few to many, linear or pinnatifid. Calyx teeth minute, ovate-triangular, deciduous in fruit. Petals pale yellow to whitish, ovate or ovate-elliptic. Styles short, reflexed. Fruit oblong-ellipsoid or subglobose, slightly flattened dorsally; ribs 5, all broadly winged, sometimes somewhat unequally; commissure constricted; vittae 3–4 in each furrow, 4–6 on commissure. Seed face concave. Carpophore 2-cleft.

- Six species.

1a. Caudex developed, elongate or tuberous, with clusters of rootlets, strongly aromatic; rays (7–)12–25(–40), (2)–5–12 cm.

2a. Bracteoles pinnatifid ............................................................................................................................. 6. N. pinnatiinvolucellum

2b. Bracteoles linear or linear-lanceolate, entire.

3a. Ultimate leaf segments oblong, margin pinnatifid or variously laciniate-dentate ........................................ 1. N. incisum

3b. Ultimate leaf segments ovate to oblong-ovate, margin entire or coarsely toothed ........................................ 2. N. franchetii

1b. Caudex not thickened, taproot unbranched or with slender branches, slightly aromatic; rays 5–12, 1–5 cm.

4a. Leaves 3–4-pinnate/pinnatifid ............................................................................................................................ 5. N. tenuifolium

4b. Leaves 2-termate/ternatifid.

5a. Ultimate leaf segments ovate-lanceolate, 2.5–8 cm; bracteoles linear, shorter than flowers ........................... 3. N. forrestii

5b. Ultimate leaf segments ovate, 1.5–3.5 cm; bracteoles filiform, longer than flowers ........................................ 4. N. oviforme


羌活 qiang huo

Plants 60–120 cm. Root stout, with clusters of rootlets; caudex elongate, often node-scared, strongly aromatic. Leaves ternate-3-pinnate; petiole 5–12 cm; ultimate segments oblong or oblong-ovate, 2–5 × 0.5–2 cm, margins pinnatifid or laciniate-dentate, puberulous on veins and margins. Leaves reduced upwards, petioles becoming wholly sheathing. Umbels 3–13 cm across, lateral umbels frequently sterile; bracts 3–6, linear-lanceolate, 0.5–1.5 cm; rays 10–17(–23), 6–10, linear, 3–13 × ca. 0.5 mm, shorter or longer than flowers; umbellules many-flowered, crowded; pedicels 5–10 mm. Calyx teeth ovate-triangular, 0.3–5 mm. Petals white or greenish-white, ovate to oblong-ovate, ca. 1.5 × 1 mm, apex obtuse, in- flexed. Fruit oblong-ellipsoid, 5–6 × 2.5–3.5 mm, all ribs winged, wings equal or unequal; vittae 3–4 in each furrow, 4 on commissure. Fl. Jul–Aug, fr. Aug–Sep.

- Forest margins, scrub; 1700–4800 m. Gansu, Hubei, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Yunnan.

The rootstock and root are used in some districts instead of Notopterygium incisum for the important traditional medicine “qiang huo.”


宽叶羌活 kuan ye qiang huo

Angelica rubrivaginata H. Wolff; Drymoscias forbesii (H. de Boissieu) Kos- ro-Poljansky; D. franchetii (H. de Boissieu) Kos- ro-Poljansky; Notopterygium franchetii H. de Boissieu

Plants 80–180 cm. Root stout, with clusters of rootlets; caudex tuberous, strongly aromatic. Leaves ternate-2–3-pin- nate; petiole 3–8 cm; blade to 25 × 35 cm; pinnate 2–3 pairs, proximal pinnule long-petiolulate; ultimate segments oblong-ovate, 3–8 × 1–3 cm, base obtuse or cuneate, puberulous on veins and margins. Leaves reduced upwards to 3 leaflets, sheaths broadly ovate. Umbels 5–14 cm across; peduncles 5–25 cm; bracts 1–3, linear-lanceolate, 0.5–1.5 cm; rays 10–17(–23), 3–12 cm; bracteoles 4–5, linear, 3–4 mm, very short; umb- lules many-flowered; pedicels 0.5–1 cm. Calyx teeth ovate-triangular, ca. 0.5 mm. Petals pale yellow or yellowish-green, obovate, apex inflexed. Fruit oblong-ellipsoid, ca. 5 × 4 mm; vittae 3–4 in each furrow, 4 on commissure. Fl. Jul–Aug, fr. Aug–Sep.

- Forest margins, scrub; 1700–4800 m. Gansu, Hubei, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Yunnan.

The rootstock and root are used in the important traditional medicine “qiang huo.”


澜沧羌活 lan cang qiang huo

Plants 50–100 cm. Taproot slightly aromatic. Stem little- branched above. Lower leaves 2-ternately dissected; petioles 4–6 cm; blade broadly triangular, 8–15 × 8–15 cm; ultimate segments ovate-lanceolate to oblong-lanceolate, 2.5–8 × 1–3 cm, puberulous along veins, margins glabrous, abaxially glaucous, base cuneate or truncate, sometimes oblique, margins irregular or sharply serrate. Leaves reduced upwards becoming 2–3-lobed; segments linear. Umbels 4–10 cm across; bracts absent, or 1, linear, 0.5–1.5 cm; rays 5–9, 1–3.5 cm, unequal, spreading; bracteoles 2–4, linear, shorter than flowers; umbellules 9–14-flowered, open; pedicels 4–8 mm, unequal. Calyx teeth ovate-lanceolate, 0.3–0.6 mm. Fruit subglobose, ca. 3.35 × 2.5–3 mm; all ribs broadly winged; vittae 2(–3) in each furrow, 2 on commissure. Fl. Jul–Aug, fr. Sep–Oct.

- Forest margins, mountain slopes, gravelly river banks; 2000–3000 m. SW Sichuan (Muli), NW Yunnan.


卵叶羌活 luan ye qiang huo

Notopterygium forbesii H. de Boissieu var. oviforme (R. H. Shan) H. T. Chang

Plants to 40–60 cm. Rootstock slightly aromatic. Basal leaves few, petioles ca. equal to blades; blade broadly ovate, 2-ternately dissected, 5–9 × 3–5 cm; ultimate segments ovate or
elliptic, 1.5–3.5 × 0.6–3 cm, central segments obovate, base cuneate, lateral segments ovate or elliptic, base truncate, margins serrulate, apex obtuse. Stem leaves usually single, petiole wholly sheathing; blade divisions linear. Umbels 3–5 cm across; bracts 2–3, linear, 2–5 mm, or absent; rays 5–9, 1–4.5 cm, very unequal; bracteoles 2–4, ca. 3 × 0.2 mm, filiform, longer than or equaling flowers, 5–8 × 0.5 mm in fruit; umbellules 6–12-flowered; pedicels short, 2–3 mm, unequal. Fruit globose, 4–5 × 2–3 mm; all ribs broadly winged, wings unequal; vittae 2 in each furrow, 4–6 cm across; bracteoles 2–4, ca. 3 × 0.2 mm, filiform, across; bracts 2–3, linear, 2–5 mm, or absent; rays 5–9, 1–4.5 cm, wholly sheathing; blade divisions linear. Umbels 3–5 cm across; bracts 1–4, linear-lanceolate, 2–5 × 0.5–1 mm, unequal, apex caudate; rays 8–12, 2–5 cm, unequal; bracteoles 6–8, linear-lanceolate, ca. 3 × 1 mm, apex caudate; umbellules 6–15-flowered; pedicels 0.5–1 mm, ca. 2 mm in fruit. Fruit ellipsoid-oblong, ca. 4 × 2.5 mm; ribs all broadly winged; vittae 2 in each furrow, 5–6 cm on commissure. Fl. Jul–Aug, fr. Sep–Oct.

- Forest margins, mountain slopes; 1800–2000 m. Chongqing (Nanchuan), S Shaanxi (Shanyang, Taibai Shan, Zhenba), SC Sichuan (Emei Shan).

This poorly known taxon is recorded only from a few collections.


细叶羌活 xi ye qiang huo

Plants 40–70 cm, glabrous throughout. Root long-conic, chocolate-brown, slightly aromatic; caudex ca. 1 cm, clothed with few remnant sheaths. Basal leaves several, petioles 16–19 cm, sheaths narrowly lanceolate; blade broad-ovate, 13–16 × 8–12 cm, 3–4-pinnate/pinnatifid; pinnae 6–8 pairs, pinnules 4–5 pairs; ultimate segments obvolute to linear, 2–5 × 1.5–4 mm, 2–3 parted or entire, margin narrowly reflexed, apex apiculate, usually gray-green, thick, papery. Stem leaves 1–2, reduced and less divided, petioles wholly sheathing, sheaths ovate-lanceolate.

Umbels 5–6 cm across; bracts 1–4, linear-lanceolate, 3–7 × 0.5–1 mm, unequal, apex caudate; rays 8–12, 2–5 cm, unequal; bracteoles 6–8, linear-lanceolate, ca. 3 × 1 mm, apex caudate; umbellules 6–15-flowered; pedicels 0.5–1 mm, ca. 2 mm in fruit. Fruit ellipsoid-oblong, ca. 4 × 2.5 mm; ribs all broadly winged; vittae 2 in each furrow, 5–6 cm on commissure. Fl. Jul–Aug, fr. Sep–Oct.

- High-altitude alpine meadows in valleys; ca. 4300 m. W Sichuan (Litang, Yajiang).


羽苞羌活 yu bao qiang huo

Plants 1–1.5 m high. Rootstock stout, elongate, strongly aromatic. Stem finely striped, glabrous, little-branched above. Basal leaves petiolate, petioles 1–2 cm, sheaths oblong, large, 2–5 cm across; blade ternate-3-pinnate/pinnatifid; ultimate segments lanceolate, 3–7 × 0.5–1 cm, margins incised dentate or pinnatisect. Leaves reduced upwards, less divided, petioles becoming wholly sheathing. Umbels 6–9 cm across, lateral umbels usually sterile; bracts few, linear, caducous; rays 14–24, 7–10 cm; bracteoles 7–12, ob lanceolate, 15–25 cm, much longer than the umbellules in fruit, pinnate, rarely entire; pedicels ca. 0.3 mm. Fruit oblong-ovoid, 4–5 × 3–4 mm; ribs broadly winged, sometimes wings unequal; vittae 1–3 in each furrow, 2–4 cm on commissure. Fl. & Fr. Jul–Nov.

- Among shrubs in grassland at coniferous forest margins; ca. 3400 m. W Sichuan (Xiaojin).


舟瓣芹属 zhou ban qin shu

Pan Zehui (潘泽惠); Mark F. Watson

Herbs, perennial, all parts glabrous. Taproot thick, long-conic, branched. Stem stout, usually solitary, unbranched, hollow, ribbed, pubescent, base densely clothed with fibrous remnant sheaths. Leaves mostly basilar, petiole sheath broad and clasping at base, base often below ground level; blade (2–)3–4-ternate-pinnate, very finely divided, rather small; ultimate segments narrow. Umbels compound, mainly one large terminal and a few smaller lateral umbels; bracts absent; rays many, subequal, thick, congested; bracteoles many, 2–3-pinnate or entire, margin scarious; umbellules many-flowered, congested. Calyx teeth small, ovate or ovate-triangular. Petals ovate or obovate, yellowish or white, sometimes flushed purple, midvein darker, base clawed, apex inflexed. Stylodium low-conic, dark purple; styles long, reflexed. Fruit ellipsoid, slightly laterally compressed; ribs 5, dorsal ribs filiform; lateral ribs very narrowly winged; vittae large, 2–3 in each furrow, 2 on commissure. Seed face concave. Carpophore very slender, 2-parted to base.

- One species.


舟瓣芹 zhou ban qin

Plants (8–)15–30 cm. Stem (0.5–)1–2.5(–3) cm thick. Petioles 2–10 cm, slender, sheaths narrow-oblong, 3–6 × 1–1.5 cm; blade ovate-oblong or oblong, 4–7 × 2.5–7 cm; pinnae 5–6 pairs, proximal pinnae short-petiolate; ultimate segments linear, 1–4 × 0.5–2 mm, apex rounded, entire or 2–3-toothed. Primary umbels (3–)6–16 cm across; bracts 1–4 cm, about half as long as rays; rays 15–35(–50), 2–9 cm, subequal, suberect-ascending, hollow and ribbed; pedicels 2–7 mm, membranous-winged. Calyx teeth 0.4–0.8 mm, persistent in fruit. Petals 2–2.5 × 1.2–1.5 mm. Anthers dark purple. Styles 1.5–2 mm. Fruit ca. 4 × 1.5 mm. Fl. May–Sep, fr. Jul–Oct.

- Alpine grassy slopes, alpine sandy areas, scree, rock crevices; 3300–5000 m. Qinghai, SW Sichuan, SE Xizang, NW Yunnan.

1a. Bracteoles entire, almost as long as umbellule .................................................. 1a. var. alpina

1b. Bracteoles 2–3-pinnate, exceeding umbellule .................................................... 1b. var. dissecta
1a. Sinolimprichtia alpina var. alpina

Bracteoles broadly obovate in outline, 10–20 × 6–15 mm, exceeding umbellule, 2–3-pinnate.
- Alpine grassy slopes, screes, rock crevices; 3500–4800 m. SW Sichuan, SE Xizang, NW Yunnan.

This high-altitude, short, stout plant, with characteristic, highly dissected bracteoles, is more commonly collected than the typical variety. This plant is superficially very similar to *Ligusticum capillaceum* and has often been confused with it. *Ligusticum capillaceum* is generally hirsute, especially along the leaf rachis, rays, pedicels, bracts, and bracteoles, has lacerate bracteoles with acute lobes, and greatly dorsally compressed fruit. *Sinolimprichtia alpina* var. *dissecta* is completely glabrous, has smooth-margined bracteoles with rounded lobes, and slightly laterally compressed fruit.

1b. Sinolimprichtia alpina var. dissecta


Purple san qin shu

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

Herbs perennial, stout. Taproot elongate. Stem erect, much branched, purplish. Leaves long petiolate, sheaths membranous, purplish; blade 2-ternate, glabrous except veins and rachis densely pilose. Leaves reduced upwards, blade becoming 3-lobed. Inflorescence branching, umbels compound, terminal and lateral, rather small; bracts several, caducous; bracteoles several, persistent; rays and pedicels densely hirsutulous with purplish hairs. Calyx teeth obsolete or minute, triangular. Petals dark purple, suborbicular, apex notched, with a narrow incurved tip. Ovary granular-puberulent. Stylodium low-conic, dark purple, margin undulate; styles purple, reflexed. Fruit subglobose, compressed laterally, surface roughened, appearing granular; ribs 5, prominent; vittae 2–4 in each furrow, 6 on commissure. Seed face nearly plane. Carpophore 2-cleft to base.

- One species.


Purple san qin

*Angelica involucellata* Diels; *Pimpinella pimpinelloidea* (H. de Boissieu) M. Hiroe (1979 [“pimpinelloideum”]), not *P. pimpinelloides* (Hochstetter) H. Wolff (1927).

Plants 0.5–2 m. Taproot 15–20 × 1.5–2 cm. Lower petioles 10–20 cm; leaf blade broadly ovate-triangular, 15–25 × 10–20 cm; ultimate segments ovate, 3–10 × 2–6 cm, base cuneate, margins serrate, apex acuminate, adaxially green, abaxially slightly glaucous. Umbels 1.8–5.5 cm across; peduncles 1.5–4 cm, densely puberulent; rays 5–14, 0.2–2 cm, very unequal; bracteoles 5–10, linear-filiform, 1–6 mm, dark purple or greenish, as long as flowers, pilose; umbellules 10–20-flowered; pedicels 0.5–7 mm, dark purple. Fruit 2–2.8 × 1.7–1 mm. Fl. and fr. Jul–Sep.

- One species.


Li guo qin shu

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

Herbs perennial, small. Taproot long-conic, rarely fusiform. Stem simple, usually very short and appearing acaulescent. Basal leaves petiolate, petioles sheathing. Leaves reduced upwards. Inflorescence branching, umbels compound, terminal on stem and branches; bracts 2–3-lobed to pinnate or absent; rays 5–20, those of primary terminal umbel stout, spreading-ascending or diffuse; bracteoles similar to bracts or absent; umbellules 10–30-flowered. Calyx teeth usually minute or obsolete. Petals ovate or obovate, white or purplish-red, base cuneate or shortly clawed, apex incurved and notched. Stylodium low-conic, styles spreading to reflexed. Fruit broadly ovoid, rarely oblong-ovoid, slightly laterally compressed, glabrous, sometimes with small tubercles between ribs; ribs filiform, conspicuous; vittae 1–4 in each furrow, 4–8 on commissure. Seed face slightly to deeply concave. Carpophore various.

About six species (see following note): widespread across C Asia to the Himalayan region and SW China; six species (four endemic) in China.

This genus has received very mixed treatments since its establishment by Lindley in 1835. Norman (J. Bot. 76: 229–233. 1938) studied the genus critically, resolving some of the confusion, and commented that probably all plants assigned to *Trachydiu* since Lindley’s day really belong to other genera. However, the high-altitude, dwarf plants exhibit complex variation and the taxonomy continues to be controversial, particularly when delimiting boundaries with other genera containing similar species of reduced stature (e.g., *Aulacospermum*, *Chamaescoliadum*, *Chamaesium*, *Ligusticum*, *Physopermonopsis*, *Pleuroserpentum*, *Schulzia*, and *Sinoarum*). Some authors follow Norman and limit *Trachydiu* to a unispecific genus including *T. roylei*, while others extend the circumscription to include anything up to 14 additional species. It is acknowledged that the following species form a heterogeneous group, but a conservative treatment has been adopted here as new, comprehensive material is needed to determine proper speci-
1a. Leaves simple, 3-lobed to middle; blade orbicular or broadly ovate ...................................................... 1. *T. simplicifolium*

1b. Leaves compound; blade triangular or oblong-lanceolate in outline.

2a. Leaves trifoliate; bracts and bracteoles absent (Yunnan) ...................................................................... 2. *T. trifoliatum*

2b. Leaves ternate-pinnate or 2–3-pinnate; bracts and bracteoles present or not.

3a. Leaves ternate–1–3-pinnate; bracts linear, entire or apex 3-lobed; bracteoles similar to bracts; calyx teeth minute or obsolete.

4a. Ultimate segments of leaves ovate, pinnate-lobed or incised; petal base cuneate; fruit densely tuberculculate between ribs; seed face deeply concave .................................................. 3. *T. subnudum*

4b. Ultimate segments of leaves linear-ob lanceolate, entire or 3-lobed at apex; petal base shortly clawed; fruit with scattered tubercles between ribs; seed face slightly concave ........................................... 4. *T. tibetanicum*

3b. Leaves 2–3-pinnate; bracts and bracteoles 2–3-lobed or 1–2-lobed, rarely entire; calyx teeth obsolete.

5a. Bracts and bracteoles 2–3-lobed or 1 pinnate, rarely entire; vittae numerous in each furrow .... 5. *T. involucellatum*

5b. Bracts and bracteoles 1–2-pinnate; vittae solitary in each furrow ...................................................... 6. *T. roylei*


*Single tooth cumin*

*Ligusticum simplicifolium* (W. W. Smith) M. Hiroe.

Plants 7–20(–30) cm. Stem erect, purplish, sparsely pubescent. Lower leaves 2–7; petioles 2–18 cm, sheaths 1–3 cm, inflated, flushed purple, densely pubescent; blade orbicular or broadly ovate, 3-lobed divided to middle, 2–12 × 1.8–10 cm, glabrous except veins scabrous, adaxially green, abaxially dark purple, base cordate, margin crenate. Leaves reduced upwards with large sheaths. Umbels 1.5–4 cm across; bracts absent or 1–2, lanceolate, entire or apex 2–3-lobed; rays 6–12, purplish, (1.5–)2–4(–5) cm, subequal, sparsely pubescent; bracteoles ca. 10, narrowly ob lanceolate, purple, to 12 mm, just longer than flowers, entire. Calyx teeth minute. Petals white or purplish, slightly clawed at the base. Fruit oblong-ovoid, ca. 2 × 1 mm, smooth or scattered-tuberculculate; ribs filiform to thickened; vittae 1–2 in each furrow, 4 on commissure. Seed face slightly concave. Carpophore parted to base. Fl. and fr. Aug–Nov.

- Alpine meadows, stony slopes; 2700–4000 m. NW Yunnan.
- This distinctive species is often collected in flower, but the fruit is poorly known.


*Three tooth cumin*

Plants slender, 4–10 cm, purplish. Stem erect. Leaves 3-foliolate; leaflets broadly ovate or rotund, 8–12 × 8–10 mm, 3-lobed, margin sparsely crenate. Leaves reduced upwards to a broad sheath and 3-lobed blade. Umbels 1.5–4 cm across; bracts and bracteoles absent; rays 8–12, 1–2.5(–4) cm, unequal. Calyx teeth minute, narrowly triangular, ca. 0.3 mm. Petals white. Mature fruit unknown, young fruit broadly ovoid, tuberculculate. Fl. and fr. Sep–Oct.

- Stony alpine meadows; ca. 4000 m. W Yunnan (Ruili).
- This poorly known taxon is recorded only from the type gathering.


*密瘤瘤果芹*


Plants 10–20(–30) cm. Stem often reduced, branched or not, plants almost rosette. Basal leaves petiolate; blade oblong-lanceolate, ternate-2-pinnate, to 7 × 2 cm; primary pinnae 4–5 pairs, remote; ultimate segments ovate or lanceolate, 3–5 × 1–4 mm, margins incised, both surfaces moderately hispid. Stem leaves reduced upwards, pinnate. Umbels 9–25 cm across, lax; bracts absent, or occasionally 1, linear; rays 5–7, purplish, long and spreading, 4–16 cm, unequal; umbellules 12–17 mm across; bracteoles 2–7(–15), linear, just shorter than flowers. Calyx teeth obsolete. Petals white, base cuneate. Fruit broadly ovoid, ca. 3 × 2 mm, ribs filiform, densely tuberculculate especially on ribs; vittae 3 in each furrow, 6 on commissure. Seed face deeply concave. Fl. and fr. Jul–Sep.

- Alpine meadows; 3000–4500(–5000) m. SW Sichuan, S Xizang [NE India].


*西藏瘤果芹*

Plants 8–13 cm. Stems very short, plants almost rosette. Petioles slender, sheaths broad, clasping; blade triangular in outline, ternate-2–3-pinnate; primary pinnae 3–4 pairs; ultimate segments linear-ob lanceolate, 4–5 × 1–2 mm, entire or apex 3-lobed. Umbels 8–18 cm across, lax; bracts absent; rays 10–20, 4–8(–14) cm, unequal; bracteoles absent, or occasionally 1, linear, shorter than flowers. Calyx teeth obsolete. Petals white or purplish, base shortly clawed. Fruit broadly ovoid, 1–1.5 × ca. 1 mm, scattered-tuberculculate; vittae 3 in each furrow, 6 on commissure. Seed face slightly concave. Fl. and fr. Aug–Nov.

- Alpine meadows, moist rock crevices; 3000–4000 m. NW Sichuan (Dêgê), SE Xizang (Zayü), NW Yunnan.
- Possible affinities between this species and *Sinocarum* need further study.


*裂苞瘤果芹*

Plants 8–16 cm. Stem erect, dull purplish, branching, sparsely pubescent to almost glabrous. Basal leaves petiolate; blade triangular or triangular-ovate, 2–3-pinnate; primary pin-
The following species have been described from Chinese material, but are imperfectly known as no specimens have been seen or the specimens are inadequate.

**Trachydium szechuanense** H. Wolff (Acta Horti Gothob. 2: 299. 1926), described from N Sichuan (ca. 4000 m, K. A. H. Smith 3428, holotype, GB).

**Trachydium variabile** H. Wolff (Acta Horti Gothob. 2: 298. 1926), described from N Sichuan (4000–4500 m, K. A. H. Smith 2988, 3205, 3232, 3723, 3888 & 4181, syntypes, GB).


**毒参** *du shen shu*

*Pan Zehui (潘泽惠); Mark F. Watson*

Herbs, biennial or shortly perennial, slender. Root stout, long-conic. Stem hollow, erect, much-branched above, conspicuously purple-spotted. Leaves petiolate, narrowly sheathing at base; blade 2–3-pinnate, finely dissected. Umbels numerous, terminal and lateral on dichotomous branches; bracts and bracteoles several, often reflexed; rays numerous, ascending; rays numerous, spreading widely. Calyx teeth obsolete. Petals white or yellowish white, obovate or obcordate, apex incurved. Stylopodium low-conic, styles short, reflexed. Fruit ovoid or broad-ovoid, slightly flattened laterally; ribs 5, prominent, all ridged to very narrowly sinuate-winged; vittae small, numerous, completely encircling the seed, usually broken down in mature fruit. Seed face deeply concave or sulcate. Carpophore 2-cleft, at least to middle.

About six species: native to the Mediterranean region, widely naturalized in the N temperate zone; one species (introduced) in China.


**毒参** *du shen*

*Pan Zehui (潘泽惠); Mark F. Watson*

Plants 80–200(–300 cm), essentially glabrous. Basal leaves on long-petioles, petioles 7–25 cm, sheaths small, narrow; blades 2–3-pinnate, 10–30 × 6–28 cm, finely divided; pinnae petiolulate; ultimate segments oblong or ova-lanceolate, 1–3 × 0.5–1 cm, short-petiolulate, incised or pinnatifid. Leaves gradually reduced upwards. Umbels 4–7 cm across, lateral umbels overtopping the terminal; peduncles 2–7 cm; bracts 4–6, ovate-lanceolate, acuminate, 2–5 cm, reflexed; rays 10–20, 1.5–4 cm, unequal; bracteoles 5–6, ovate, 1.5–3 mm, fused at base; pedicels 10–20, 1–5 mm, unequal. Petals ca. 1.5 × 1 mm. Fruit 2–4 × 1.5–2.5 mm. Fl. and fr. May–Aug. *n* = 11.

Forest margins, cultivated field margins. Xinjiang [native to the Mediterranean region, widely naturalized in the N temperate zone].

This notorious plant (hemlock) was famously used to kill Socrates. All part of the plants are poisonous (containing toxic alkaloids, C8H17N), but can be used medicinally to relieve pain and reputedly as a cancer cure.


**栓翅芹属** *shuan chi qin shu*

*Pan Zehui (潘泽惠); Mark F. Watson*

Herbs, perennial. Root long-conic, woody. Stem erect, branched, base clothed in stiff or fibrous remnant sheaths. Basal leaves caespitose, petiolate, sheathing at base; blade 3–4-pinnate; ultimate segments linear, entire. Leaves reduced upwards. Umbels compound, terminal or lateral; bracts several, linear or lanceolate; bracteoles similar to bracts. Calyx teeth obsolete. Petals white or yellow, ovate or elliptic, apex incurved. Stylopodium depressed, almost hidden in the apex of mature fruit; styles short, spreading. Fruit...
oblong to ellipsoid, somewhat dorsally compressed; ribs 5, dorsal ribs filiform, lateral ribs winged, or all ribs inconspicuous; mesocard thick, corky; vittae numerous, small, encircling seed. Seed face inflexed into a deep T-shaped groove. Carpophore 2-parted.

About 30 species; C and SW Asia, Mediterranean region; four species in China.

Several conflicting taxonomies exist for Prangos and the related genera Cachrys Linnaeus, Cryptodiscus Schrenk, Hippomaranthum Link, and Neocryptodiscus Hedge & Lamond. The genus is treated here in the broad sense.

1a. Petals white; fruit subspherical, 4–9 mm.
   2a. Leaf blades oblong, 10–30 × 3–5 cm; rays hispid; ovary densely hispid ........................................................... 1. P. cachroides
   2b. Leaf blades broad-ovate, 10–15 × 5–10 cm; rays glabrous; ovary glabrous ........................................................................... 2. P. didyma
1b. Petals yellow; fruit oblong- or obovoid-ellipsoid, 9–18 mm.
   3a. Ultimate leaf segments densely hairy; fruit oblong-ellipsoid; ribs inconspicuous ................................................... 3. P. herderi
   3b. Ultimate leaf segments glabrous; fruit obovoid-ellipsoid; primary and secondary ribs conspicuous ......................... 4. P. ledebourii


Plants 40–70 cm. Stem hispid, lower branches opposite, upper branches opposite or cyclic. Basal petioles hispid; blades triangular-ovate, ca. 21 × 23 cm, 3–4-pinnate; ultimate segments linear, 5–15 × 0.8–1 mm, margin densely hispid. Umbels ca. 5–6.5 cm across; peduncles short, ca. 2.4 cm, lateral peduncles long, 8.5–10 cm; hispid; bracts 2–5(–7), linear, 5–15 mm, hispid; rays 6–11, 2–6 cm, subequale; bracteoles 3–5, narrowly lanceolate, 0.6–1.2 cm; pedicels 6–10, 5–7 mm. Petals yellow, lanceolate, glabrous. Ovary smooth. Fruit oblong-ellipsoid, 9–12 × ca. 6 mm; ribs inconspicuous. Fl. and fr. May–Jul.

- Grassy slopes; ca. 1100 m. W Xinjiang.

This incompletely known taxon is recorded only from a few collections. Prangos herderi subsp. herderi is distributed in Kazakhstan.


Plants 50–60 cm. Stem shortly pubescent, upper branches opposite or cyclic, base without remnant sheaths. Basal petioles short, pubescent; blades broad-ovate, 25–30 × 25–35 cm, 3–4-pinnate-pinnate; primary and secondary pinnae long-petiolulate, pinnaules 4–10 cm; ultimate segments linear, 5–20 × 0.5–1.5 mm, margin ciliate. Umbels 8–15 cm across, cymosely arranged; peduncles 4–7 cm; bracts 5, linear, 8–12 mm, unequal; rays 5–10(–18), 2–5 cm, glabrous or sparsely scabrous; bracteoles 5–6, ovate-lanceolate, 2–4 mm, unequal, shorter than flow- ers, scarious; pedicels 7–12, 2–5 mm, elongating to 9 mm in fruit. Petals yellow, oblong-acuminate, glabrous. Ovary glabrous. Fruit obovoid-ellipsoid, 10–18 × 5–10 mm; primary ribs prominent, winged, secondary ribs thinly filiform. Fl. May, fr. Jun. n = 11.

Grassy or gravelly slopes; 500–1100 m. W Xinjiang [Kazakhstan, Kyrgyzstan, Russia, Uzbekistan].
33. SCALIGERIA de Candolle, Coll. Mém. 5: 70. 1829, nom. cons., not Scaligera Adanson (1763).

Herbs, perennial. Rootstock tuberous. Leaves 3–4-pinnate; ultimate segments linear. Umbels compound, terminal and lateral; bracts and bracteoles present, filiform. Calyx teeth obsolete. Petals white, obovate, median vein dark, apex notched, incurved. Stylodium conic; styles short, reflexed. Fruit oblong-ellipsoid, slightly dorsally compressed, smooth; ribs 5, dorsal ribs slightly prominent, lateral ribs obsolete; vittae 1, transverse-slit, in each furrow, 2 on commissure. Seed face deeply concave to plane. Carpophore 2-cleft at apex.

About 22 species: C and SW Asia, E Mediterranean region, mainly in Russia; one species in China.


**丝叶芹** si ye qin


Plants 50–80(–120) cm. Tuber globose, ca. 1.5 cm across. Stem thinly ribbed, branched. Basal and lower leaves long-petiolate, withering at flowering, petiole 2–6 cm, sheath narrow, clasping; blades broad-ovate, ca. 13 × 8 cm, 3–4-pinnate, finely divided; pinnae all petiolate; ultimate segments linear-filiform; ca. 10 × 1–2 mm, entire. Cauline leaves sessile, ultimate segments longer and narrower, 10–20 × 0.2–0.5 mm. Umbels 2.5–6 cm across; peduncles 2.5–7 cm; bracts 2–6, 1.5–6 × ca. 0.15 mm, unequal; rays 6–20, 0.4–3 cm, very unequal; bracteoles 2–6, 1–3 mm, unequal, shorter than flowers; pedicels 10–25, 1–5 mm, unequal. Petals ca. 1 mm. Fruit 2.4–4.0–1.8 mm, brown. Fl. May–Jun, fr. Jul.–Aug.

Shrubby thickets, grassy slopes. Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan].

This species is often included within *Bunium* Linnaeus on account of the globose tuber.

34. **BUPLEURUM** Linnaeus, Sp. Pl. 1: 236. 1753.

**柴胡属** chai hu shu

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs perennial, rarely annual, glabrous. Rootstock usually short, woody. Stem alternate or dichotomously branched, green or glaucous, base with or without fibrous remnant sheaths. Leaves entire, petioles sheathing; blade membranous, herbarious or coriaceous, usually with parallel venation, base usually tapering into petiole. Cauline leaves often sessile, clasping, auriculate or perfoliate. Inflorescence loose, umbels compound, terminal and lateral; bracts several, conspicuous, often similar to uppermost leaves; rays few to many; bracteoles several, conspicuous. Calyx teeth obsolete. Petals yellow, greenish-yellow, tinged purple or purple, oblong to orbicular, apex narrowly inﬂexed. Stylodium conic, low-conic or discoid; styles short, often reflexed. Fruit oblong to ovoid-oblong or ellipsoid, slightly laterally compressed, mericarps subpentagonal (rarely rounded) in cross section; ribs 5, filiform, prominent or obscure; vittae 1–3(–6) in each furrow, 2(–6)(–8) on commissure, sometimes obscure. Seed face plane. Carpophore 2-cleft to base.

About 180 species: widespread in the N temperate zone, one species (*B. munditii* Chamisso & Schlechtendal) in S Africa; introduced in Australasia; 42 species (22 endemic) in China.

This distinctive genus is easily recognized by the simple leaves and conspicuous bracts and bracteoles. Species within *Bupleurum* are, however, notoriously difficult to identify on account of wide morphological variation within a species, often spread across wide geographic distributions. Many *Bupleurum* species are difficult to characterize, as is evident by complex classifications where all possible taxonomic ranks have been used. Several taxa are recorded only from a few collections, and it is likely that future work will reduce the number of species. The roots of several species of *Bupleurum* are famous for their use as the traditional Chinese medicine “chai hu” for treatment of coughs, fevers, and influenza. Almost all of the species are recorded in the literature as regional substitutes for “chai hu” or for other local medicinal purposes. However, caution should be applied as some species are toxic (e.g., *B. longiradiatum*) and can result in “toxic strike” if misused as such substitutes.

1a. Bracteoles large and conspicuous, mostly exceeding the umbellule.

2a. Cauline leaves broadly ovate, 10–20 × 3–5.5 cm, base dilated, rounded, perfoliate (Xinjiang) ..................... 3. *B. aureum*

2b. Cauline leaves linear, lanceolate or narrowly ovate, 1–15 × 0.1–1 cm, base dilated or not, but never perfoliate.

3a. Plants small, 7–20(–25) cm.

4a. Bracteoles yellow or tinged purple.

5a. Plants erect; bracteoles 5–8, yellow-green; stylodium dark yellow (NW China) ................................. 4. *B. triradiatum*

5b. Plants decumbent; bracteoles 6–10, tinged purple; stylodium dark purple (NW and SW China) ... 9. *B. dalhousieanum*

4b. Bracteoles green.

6a. Leaves and bracteoles abaxially glaucous, 3–5-nerved; umbellules 10–20-flowered (Qinghai, Xinjiang) ....................................................................................................................................................... 5. *B. densiflorum*
6b. Leaves and bracteoles abaxially not glaucous, 9–15-nerved; umbellules 8–14-flowered (Sichuan, Xizang, Yunnan) .......................................................... 10. *B. yunnanense*

3b. Plants tall, 25–125 cm.

7a. Middle and upper leaves base dilled, cordate and clasping.

8a. Root dark brown; bracteoles usually 6–9; petals yellow-green (NC and NW China) ....................... 8. *B. smithii*

8b. Root gray-brown; bracteoles usually 10–12; petals usually dark purple (C, NW, and SW China) .... 16. *B. longicaule*

7b. Middle and upper leaves base not dilated nor cordate.

9a. Inflorescence many-branched, forming a panicle (Yunnan) .......................................................... 11. *B. luxiense*

9b. Inflorescence little-branched, not forming a panicle.

10a. Petals purple or dark purple (at least abaxially).

11a. Bracteoles 5(–7), green, broadly ovate, apex rounded or acute, apiculate (Jilin) ...................... 7. *B. euphorbioides*

11b. Bracteoles 7–9, bluish-purple, elliptic, apex acuminate, long-apiculate (NW and SW China) .................. 13. *B. commelynoideum*

10b. Petals yellow.

12a. Lateral umbel present at base of terminal umbel and overtopping it (Guizhou) .................... 17. *B. kweichowense*

12b. Terminal umbel without a lateral umbel at base.

13a. Bracts 1–2, linear-lanceolate, usually deciduous (NC and NE China) ........................................ 6. *B. sibiricum*

13b. Bracts 1–5, elliptic or ovate, persistent.

14a. Bracts elliptic, apex acuminate; rays 8–11(NW and SW China) ............................................. 15. *B. petiolulatum*

14b. Bracts ovate or suborbicular, apex rounded or obtuse; rays 4–12.

15a. Leaves thin-papery, abaxially grayish-white-green, margin not thickened, green; rays 4–8 (Sichuan, Xizang, Yunnan) ............................................................. 12. *B. candollei*

15b. Leaves thick-papery, often tinged reddish-brown, abaxially green, margins thickened and reddish; rays 7–12 (Sichuan, Yunnan) .......................................................... 14. *B. rockii*

1b. Bracteoles small, narrow, usually shorter than, equaling or slightly exceeding the umbellules.

16a. Leaves 8–25 × 2.5–10 cm, base dilated, cordate and clasping.

17a. Petals and stylopodium usually yellow; fruit dark brown (NE and NW China) ......................... 1. *B. longiradiatum*

17b. Petals and stylopodium purple; fruit dark purplish-brown (Gansu, Henan, Hubei, Shaanxi, Sichuan) .... 2. *B. boissieuanum*

16b. Leaves 2–16(–20) × 0.1–1(–3) cm, base not dilated nor cordate and clasping.

18a. Plants small, 2–20(–30) cm (sometimes more in *B. gracilimum*).

19a. Stem base densely clothed with fibrous remnant sheaths.

20a. Plants 15–30 cm; fruit 2.5–3 mm, ribs prominent; altitude 650–1550 m (NC and NE China) .......... 18. *B. bicaule*

20b. Plants 2–10 cm; fruit 3.5–4 mm, ribs conspicuous or narrowly winged; altitude 2300–3500 m (Nei Mongol, Ningxia, Qinghai, Xinjiang) ........................................ 19. *B. pusillum*

19b. Stem base without fibrous remnant sheaths (Qinghai, Sichuan, Xizang).

21a. Plants gray-green; fruit ribs broadly winged (Xizang) ...................................................... 20. *B. alatum*

21b. Plants tinged red; fruit ribs rounded or slightly prominent.

22a. Basal leaves very numerous, rosette-caespitose; rays 4–7, 3–6 cm; petals usually yellow or yellow-green (Qinghai) .................................................. 21. *B. condensatum*

22b. Basal leaves few, not rosette-caespitose; rays ca. 3, 0.5–1.7 cm; petals yellow or dark purple (Sichuan) .............................................................. 23. *B. gracilimum*

18b. Plants tall, (25–)30–125 cm (or less in *B. angustissimum* and *B. hamiltonii*).

23a. Root surface reddish-brown.

24a. Stem base without fibrous remnant sheaths (Gansu, Nei Mongol, Ningxia, Shaanxi) .................. 29. *B. yinchowense*

24b. Stem base clothed in fibrous remnant sheaths.

25a. Leaves linear, 6–16 × 2–7 mm (E, NC, NW, and SC China) ................................................... 27. *B. scorzonerifolium*

25b. Leaves narrow-linear, 6–18 × 0.8–1 mm (NC and NW China) .............................................. 28. *B. angustissimum*

23b. Root surface usually gray-yellow or brown, not reddish-brown.

26a. Fruit vittae 1 in each furrow, 2 on commissure (C, SC, and SW China) ................................. 34. *B. hamiltonii*

26b. Fruit vittae 1–3 in each furrow, 2–4 on commissure.

27a. Leaves lanceolate or oblong-elliptic, (0.5–)0.8–3 cm wide.

28a. Rootstock short, tuberous, with many fibrous fascicled roots (Heilongjiang, Jilin) ............... 24. *B. komarovianum*

28b. Taproot little-branched or unbranched.

29a. Leaf margin white cartilaginous (C, NW, and SW China) ..................................................... 35. *B. marginatum*

29b. Leaf margin not white cartilaginous.

30a. Fruit vittae 1(rarely 2–3) in each furrow, 2 on commissure (Xinjiang) ................................. 25. *B. krylovianum*

30b. Fruit vittae 3–4 in each furrow, 4 on commissure.

31a. Stem and branches usually slender and flexuose; bracts narrowly linear, 1–5 × 0.5–1 mm (C, E, NC, NE, and NW China) .................................................. 38. *B. chinense*

大叶柴胡 da ye chai hu

Plants (50–80–150 cm, perennial. Rhizome thick, little-branched. Stem usually solitary, much-branched above, base without fibrous remnant sheaths. Leaves several, basal leaves petiolate, 8–12 cm, tinged purple; blade broadly ovate-elliptic or lanceolate, 8–17 × 2.5–5(–8) cm, 9–11-nerved. Middle leaves sessile; blade ovate or narrowly ovate. Upper leaves sessile; blade broadly lanceolate, base cordate, clasping, apex acuminate. Inflorescence much-branched, remote, umbels 3–10 cm across; bracts 1–5, lanceolate, 2–10 × 1–2 mm, unequal, yellowish-green; rays 3–9, 3–35 mm, unequal, very slender; bracteoles 5–6, ovate-lanceolate, 1.5–5 × 0.5–1.2 mm, unequal; umbellules 10–15 mm across, 5–16-flowered; pedicels long, 4–8 mm, unequal, 7–15 mm in fruit. Petals yellow or purple, short-ovaricul, apex notched. Stylus frow conic, dark yellow. Fruit oblong-ellipsoidal, 4–7 × 2–2.5 mm, glaucous; mericarp subrounded in cross section; ribs obscure; vittae 3–4 in each furrow, 4–6 on commissure. Fl. and fr. Aug–Oct. n = 6*.

1a. Plants 80–150 cm; rays long, usually 25–40 mm; fruit not reddish-brown

1b. Plants 50–80 cm; rays short, 10–20 mm; fruit reddish-brown

1a. Bupleurum longiradiatum var. longiradiatum

大叶柴胡 (原变种) da ye chai hu (yuan bian zhong)

Bupleurum levelli H. de Boissieu; B. longiradiatum f. levelli (H. de Boissieu) Kitagawa.

Plants 80–150 cm. Upper leaves long-ovate or broadly lanceolate, base cordate and clasping. Fruit dark brown, glaucous.

Forests, mountain slopes; 200–900 m. Gansu, Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, SE Russia].

The endemic Bupleurum longiradiatum f. australis R. H. Shan & Yin Li (Acta Phytotax. Sin. 12: 269. 1974) is recorded from wet valleys in shady woods or grasslands at 500–1400 m in Anhui, Jiangxi, Hubei, Hubei, Hunan, and Zhejiang. This form is distinguished by having taller stature, upper leaves lanceolate or narrowly obovate, with base tapering and cuneate, and chromosome number n = 6*.


短叶大叶柴胡 duan san da ye chai hu

Bupleurum sachalinense F. Schmidt.


Woods, shady river banks; 200–800 m. Heilongjiang, Liaoning [Japan, Korea, SE Russia].


紫花阔叶柴胡 zi hua kuo ye chai hu
Bupleurum longiradiatum Turczaninow var. porphyranthum R. H. Shan & Yin Li.

Plants 80–120 cm, perennial. Stem rigid, erect, solid, much-branched from base, with profuse elongate and slender branches, base without fibrous remnant sheaths. Lower leaves many; blade lanceolate, slightly falcate, base tapering into petiole. Cauline leaves many; blade broadly ovate elliptic or broadly lanceolate, 8–25 × ca. 10 cm, base narrow, clasping, margins slightly inerased. Apical leaves small and narrow, lanceolate, sessile. Inflorescence much-branched, branches remote and slender; umbels 2–9 cm across; bracts 5, narrowly lanceolate, ca. 2 × 1 mm; rays 5–8, 2–7 cm, unequal, filiform; bracteoles 5–6, lanceolate, ca. 2 × 1 mm, equal, apex acute; umbellules 5–15 mm across, 10–15-flowered; pedicels 8–10 mm in flower, 14–18 mm in fruit, very slender. Petals dark purple. Stylodium low-conic, dark purple. Fruit oblong, dark purplish-brown, 4.5–6 × 2.5–3.3 mm; vittae 3 in each furrow, 6 on commissure.

Bupleurum longifolium Linnaeus var. aureum (Fischer ex Hoffmann) H. Wolff.

Bracteoles broadly ovate or elliptic, 5–12 × 7–9 mm, usually exceeding flowers, base obtuse, 5–9-nerved.

Forest margins, among shrubs, mountain slopes, river banks; 1300–1900 m. W Xinjiang (Tian Shan) [Kazakhstan, Kyrgyzstan, Mongolia, Russia].


三幅柴胡 san fu chai hu


Bracteoles narrowly ovate or linear-lanceolate, 2–3 × 0.7–2 mm, shorter than flowers, base tapering, 3-nerved.

● Open forests, among shrubs, mountain slopes; 1400–1600 m. W Xinjiang (Tian Shan).

This is a variant with narrow bracteoles at the southernmost limit of this C Asian species.


密花柴胡 mi hua chai hu

Bupleurum triradiatum (Adams ex Hoffmann) Regel; Diaphyllum triradiatum (Adams ex Hoffmann) Hoffmann.

Plants 7–20(–25) cm, perennial. Rhizome dark brown, creeping, little-branched. Stem erect, tinged purple at base, base without fibrous remnant sheaths. Basal leaves several, linear or lanceolate, 2.5–10 × 0.3–1 cm, 3–5-nerved, base tapering, apex obtuse-acute. Cauline leaves few, 1–4, sessile; blade narrow-ovate, 1.5–6 × 0.3–0.7 cm, base obtuse, clasping. Umbels 1–3, 2–5 cm across; bracts 1–3, ovate or broad-ovate, 5–15 × 4–14 mm, unequal, shorter than rays, 7–19-nerved; rays 2–3, erect, 1–2.5 cm; bracteoles 5–8, 3–7 × 2–6 mm, yellowish, reddish-tinged or purplish-tinged, distinctly longer than flowers, base subrounded, apex obtuse or acute; umbellules 8–15 mm across; flowers 18–26, crowded; pedicels 2–3 mm. Petals yellow or abaxially purplish, apex obtuse, inflexed. Stylodium long-conic or discoid, dark yellow. Fruit ellipsoid, brownish-red, 2.5–3 × 1.5–2 mm; ribs prominent; vittae 1–3 in each furrow, 2–4 on commissure. Fl. and fr. Jul–Sep.

Forest margins, alpine meadows, sunny slopes, rock crevices; 2300–4900 m. Qinghai, Sichuan, Xining, Xizang, NW Yunnan [N Japan, Russia].

This species has reputed medicinal value.


密花柴胡 mi hua chai hu

Plants 10–30 cm, perennial. Rhizome short, horizontal. Stems few or several, slender, base without fibrous remnant sheaths. Basal leaves many; blade narrow-lanceolate or linear, 6–13 × 0.3–0.7 cm, thin, abaxially glaucous, 3–5-nerved, base...
tapering into a long petiole. Cauline leaves 1–3, lanceolate, sessile, base clasping, apex obtuse-acute, 5–7-nerved. Umbels terminal, ca. 3 cm across; bracts 1–3, ovate-lanceolate, 5–15 × 3–5 mm, unequal, base embracing; rays 2–3(–4), slender, 1.5–5 cm, unequal; bracteoles 5–6, ovate to broadly ovate, 5–7 × 3–7 mm, exceeding flowers, 7–9-nerved; umbellules ca. 10 mm across, 10–20-flowered; pedicels ca. 2 mm. Petals yellow, mid-vein purplish, prominent. Stylodium low-conic, discoid, dark purple. Fruit oblong, dark brown, 3–4 × 2–2.5 mm; ribs acute; vittae large, 2 in each furrow, 2 on commissure. Fl. and fr. Jul–Sep.

Alpine meadows, gravelly slopes; 2500–3100 m. Qinghai, Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan].

This species has reputed medicinal value (in Xinjiang). It is considered to be closely related to Bupleurum triradiatum, and in C Asia the two taxa intergrade.


兴安柴胡 xing an chai hu

Plants 30–70 cm, perennial. Stems few or many, base often purplish-red, with or without fibrous remnant sheaths. Basal leaves many; blade narrowly lanceolate, 12–25 × 0.7–1.6 cm, 7–9 nerved, apex short-acuminate, apiculate, base tapering into petioles; petioles 5–10 cm. Upper leaves sessile; blades lanceolate, 2.5–6 × 0.8–1.1 cm, base rounded-cuneate, embracing, apex acuminately. Umbels 4–6 cm across; bracts 1–2, lanceolate, 5–10 × 1–3 mm, similar to upper leaves, deciduous; rays 5–14, 1.5–3(–5) cm, unequal, stout, slightly incurved; bracteoles (5–)7–12, elliptic-lanceolate, 5–7 × 2–3 mm, 5–7-nerved, exceeding flowers and fruit, base cuneate; umbellules 6–15 mm across, 10–20-flowered; pedicels 0.5–1.5 mm. Petals yellow. Stylo- podium low-conic, discoid, purple. Fruit ovoid-oblong, purplish-brown, ca. 3 × 2 mm; ribs prominent, narrowly winged; vittae 3 in each furrow, 4–6 on commissure. Fl. and fr. Jul–Sep. n = 32*.

Mountain slopes; 300–2000 m. Hebei, Heilongjiang, Liaoning, Nei Mongol [Mongolia, SE Russia].

Two varieties occur in China. Both have reputed medicinal value.

1a. Leaf blade narrowly lanceolate; bracteoles 7–12
1b. Leaf blade broad, ovate-lanceolate; bracteoles 5

6a. Bupleurum sibiricum var. sibiricum

兴安柴胡(原变种) xing an chai hu (yuan bian zhong)

Bupleurum dahuricum Fischer & C. A. Meyer ex Turczaninow.

Leaf blade narrowly lanceolate; bracteoles 7–12, pale yellow, usually 5-nerved.

Mountain slopes; 300–800 m. Heilongjiang, Liaoning, Nei Mongol [Mongolia, SE Russia].


雾灵柴胡 wu ling chai hu


Leaf blade ovate-lanceolate; bracteoles 5, yellowish-green, usually 7-nerved.

● Mountain slopes; 1500–2000 m. Hebei (Wuling Shan)

This rather poorly known taxon is recorded only from a few collections.


大苞柴胡 da bao chai hu

Bupleurum tatadinense I. V. Baranov.

Plants (8–)12–60 cm, annual or biennial. Taproot slender. Stem often tinged purple, 1–2-branched above, base without fibrous remnant sheaths. Basal leaf blades linear 7–15 × 0.1–0.3 cm, base tapering into petiole, 5–7-nerved. Cauline leaves narrowly lanceolate, clasping, apical leaf ovate. Umbels 2–11 cm across; bracts 2–5, ovate, 3–30 × 2–12 mm, very unequal; rays 4–11, 0.5–10 cm, very unequal, slender; bracteoles 5(–7), broadly elliptic or obovate, green, 4–9 × 1.5–5 mm, apex acute, apiculate, exceeding flowers and fruit; umbellules 6–15 mm across, 16–24-flowered; pedicels 2–3 mm. Petals yellow, abaxially purplish. Stylo- podium low-conic, discoid, purple. Fruit ovoid-oblong, purplish-brown, ca. 3 × 2 mm; ribs prominent; mericarp pentagonal in cross section; vittae 3–4(–5) in each furrow, 4 on commissure. Fl. and fr. Jul–Sep. 2n = 16*.

Forest margins, grassy places, mountain slopes; 1200–2500 m. S Jilin (Antu, Changbai Shan, Fusong) [Korea].


黑柴胡 hei chai hu

Plants 25–60 cm, perennial. Rhizome dark brown, usually branched, often thick. Stems several, tufted, stout, base without fibrous remnant sheaths. Basal leaves many; petioles often purplish-red, clasping; blade narrow-oblong or obovate, 10–20 × 1–2 cm, thick-papery, 7–9-nerved, base tapering, margins white scarious, apex obtuse or acute, apiculate. Cauline leaves sessile. Apical leaf long-ovate, 1.5–7.5 × 1–1.7 cm, base rounded, sometimes auriculate, clasping, apex acuminate. Bracts 0 or 1–2, broadly ovate, 7–18 × 8–11 mm, unequal; rays 4–9, 0.5–4 cm, unequal, angled; bracteoles 6–9, ovate or broad-ovate, 4.5–6 × 3–5 mm, equal, acute, apiculate, exceeding (to × 1.5) flowers; umbellules 1–2 cm across; pedicels 1.5–2.5 mm. Petals yellow, occasionally abaxially purplish-red. Stylo- podium low-conic, discoid, dark yellow or purple-brown. Fruit ovoid-oblong, purplish-brown, ca. 3 × 2 mm; ribs acute; vittae 3 in each furrow, 4–6 on commissure. Fl. and fr. Jul–Sep.

Mountain slopes, grassy places, sunny riverside shingle; 1400–3700 m. Gansu, Hebei, Henan, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi.
Alpine regions, mountain summits, rock crevices; 3700–4800 m. W Sichuan, S and W Xizang, NW Yunnan [Bhutan, NE India, N Myanmar, Sikkim].

This species has reputed medicinal value.


**Plant** 12–35 cm, perennial. Taproot fusiform, vertical, thickened, often branched. Stems several, slender, erect, base without fibrous remnant sheaths. Lower leaves sessile; blade linear, 4–8 × 0.15–0.4 cm, base clasping. Middle leaves sessile; blade lanceolate, 5–10 × 0.3–0.7 cm, 9–15-nerved, base rounded, embracing, apex acute. Upper leaves small, ovate-lanceolate. Umbels few, 1.5–2.7 cm across; bracts 2–4, ovate-lanceolate, 0.2–2.5 mm, unequal; rays (2–)3–5(–7), 3–25 mm, unequal; bracts 5, elliptic, 3–5 × 1–2 mm, equal, apex acuminate, about 1.5–2.5 times as long as flowers; umbel segments ca. 10 mm across, 8–14-flowered; pedicels ca. 2 mm. Petals yellow or purplish. Stylodium low-conic, discoid, yellow or purplish. Fruit oblong, brown, ca. 2.5 × 1.1 mm; ribs prominent, narrowly winged; vittae 3 in each furrow, 4 on commissure. Fl. and fr. Jul–Sep.

- Mountain slopes; 2500–5000 m. Sichuan, SE Xizang (Dinggyê), Yunnan.

This species has reputed medicinal value (in Yunnan). It is very similar to the C Asian *Bupleurum falcatum* Linnaeus.


**Plant** 55–125 cm, stout, perennial. Taproot dark brown, thick, woody, little-branched, densely marked with annular leaf scars. Stem usually tinged purple at base, base without fibrous remnant sheaths. Basal leaves caespitose, lanceolate, 10–20 × 1.6–3 cm, abaxially glaucous, 5–7-nerved, base tapering into long petiole, margins usually reddish-brown. Cauline leaves narrow-lanceolate, 8–18 × 1.2–2.5 cm, petiolate, clasping, 7–9-nerved. Apical leaves sessile, ovate, clasping, 9–11-nerved. Inflorescence profusely dichotomously branched forming a large panicle, branches spreading and rigid; umbels 2.5–4 cm across; bracts 5, obovate, 4–7 × 3–4 mm, unequal; rays 2–9, 1–4 cm; bracteoles 5, elliptic or obovate, ca. 3 × 2.5 mm, green, exceeding flowers; umbel segments ca. 10 mm across, 8–17-flowered; pedicels 0.5–1 mm. Petals yellow. Stylodium low-conic, discoid, yellow. Fruit oblong, brown, 2.3–5 × 1–2 mm; ribs prominent; vittae 3 in each furrow, 4 on commissure. Fl. and fr. Jul–Oct.

- Mountain slopes; ca. 1800 m. SE Yunnan (Jianshui, Luxi).

The roots are used in traditional Chinese medicine. This rather poorly known taxon is recorded only from a few collections.

12. *Bupleurum candollei* Wallich ex de Candolle, Prodr. 4: 131. 1830 [“candollei”].

**Plant** 40–100 cm, perennial. Taproot stout, woody, branch-
ed. Stem erect, much-branched above, branches spreading-ascending, base without fibrous remnant sheaths. Lower leaves linear-lanceolate or long-elliptic, 12–15 × 0.5–0.8 cm, 11–15-nerved, abaxially glaucous, apex rounded-obtuse, apiculate. Upper leaves long-obovate, base cuneate. Umbels 2.5–4 cm across; bracts 3–5, ovate, 3–20 × 2–10 mm, unequal; rays 4–8, 1–3 cm, unequal, slender; bracteoles 5, broadly elliptic or suborbicular, 3–6 × 1.8–4 mm, apex rounded, apiculate, greatly exceeding flowers; umbelles 8–12 mm across, 10–15-flowered; pedicels 0.5–1.5 mm. Petals pale yellow or dark purple. Stylopodium low-conic, discoid, dark yellow or dark purple. Fruit oblong, brown, 2.7–3.5 × 1.7–1.9 mm; ribs prominent, narrowly winged; vittae 3 in each furrow, 4 on commissure. Fl. Jul–Aug, fr. Sep–Oct.

Mixed forests on shady slopes, open forests, mountain slopes, grassy places; 1800–3200 m. W Sichuan, S Xizang, Yunnan [Bhutan, N India, Kashmir, N Myanmar, Nepal, Pakistan, Sikkim].

This widespread species exhibits wide variation across its geographic range. Several infraspecific taxa have been described, but these are not always distinct. This, and the following four species are morphologically very similar and further work is needed to define the taxa clearly. At least var. candollei has reputed medicinal value.

1a. Stem, bracts and bracteoles purplish-red; leaf blade abaxially not glaucous................................. 12b. var. atropurpureum

1b. Stem, bracts and bracteoles green; leaf blade abaxially glaucous.

2a. Stem moderately branched; basal leaves not spathulate, petioles short ............................... 12a. var. candollei

2b. Stem copiously branched, branches slender; basal leaves spatulate or obovate, tapering into a long petiole ............................... 12c. var. virgatissimum

12a. Bupleurum candollei var. candollei

川滇柴胡(原变种) chuan chian dian chai hu (yuan bian zhong)


Open forests, mountain slopes, grassy places; 1800–3200 m. W Sichuan, S Xizang, NW Yunnan [Bhutan, N India, Kashmir, N Myanmar, Nepal, Pakistan, Sikkim].


紫红川滇柴胡 zi hong chuan dian chai hu

Stem copiously branched, branches, peduncles and rays slender. Basal leaves spatulate or obovate, tapering toward the base, forming a long petiole, 7-nerved. Petals yellow. Stylopodium dark yellow.

- Alpine meadows; 2700–4000 m. S Gansu, SE Qinghai, W Sichuan, Xizang, NW Yunnan.

At least var. commelynoideum has reputed medicinal value. See the taxonomic note under Bupleurum candollei.

1a. Bracteoles tinged purple; umbellules 12–18 mm across ..................... 13a. var. commelynoideum

1b. Bracteoles yellow; umbellules 8–12 mm across ............................... 13b. var. flaviflorum

13a. Bupleurum commelynoideum var. commelynoideum

紫花鸭跖柴胡(原变种) zi hua ya yu chai hu (yuan bian zhong)

Stem copiously branched, branches, peduncles and rays slender. Basal leaves spatulate or obovate, tapering toward the base, forming a long petiole, 7-nerved. Petals yellow. Stylopodium dark yellow.

- Mixed forests on shady slopes; 2500–3000 m. SW Sichuan (Huidong, Miyi), Yunnan (Kunming).


黄花鸭跖柴胡 hua hua ya yu chai hu

Stem copiously branched, branches, peduncles and rays slender. Basal leaves spatulate or obovate, tapering toward the base, forming a long petiole, 7-nerved. Petals yellow. Stylopodium dark yellow.

- Alpine meadows; 2700–4000 m. S Gansu, SE Qinghai, W Sichuan, Xizang, E and S Xizang.


丽江柴胡 li jiang chai hu
Bupleurum handelii H. Wolff.

Plants 60–100 cm, perennial. Taproot branching, dark brown, woody. Stem erect, sometimes purplish-red, few-branched above, base without fibrous remnant sheaths. Basal leaves many, linear-oblong, 10–15 × 0.8–1 cm, thick-papery, often reddish brown-tinged, 11-nerved, base tapering into a long petiole, margins reddish and thickened. Cauline leaves often few, sessile; blade ovate-lanceolate, 2.5–7 × 8–12 mm, base rounded, clasping, margins purple, apex obtuse-acute. Terminal umbel 6–8 cm across; peduncles elongate and rigid; bracts 1–3, ovate-lanceolate, 7–20 × 0.5–1 cm, unequal, green or tinged red, apex obtuse-rounded; rays (3–)7–12, 1–4 cm, unequal; bracteoles 3, elliptic-obovate, 3–4 × 1.8–2.5 mm, often reddish, equaling or slightly exceeding flowers, shorter than umbellules in fruit; umbellules ca. 8 mm across, 10–12-flowered; pedicels 0.5–1.5 mm. Petals yellow. Stylodium shape low-conic, color dark yellow. Fruit ovoid, reddish-brown when mature, 4–5 × 0.5–1.5 mm. Petals yellow. Stylopodium low-conic, color reddish-brown. Fruit ellipsoid, 4–6 × 1.6–3.2 mm, base broad-cuneate, 5-nerved, usually exceeding the flowers.

- Mixed forests on mountain slopes; 2800–3900 m. Qinghai, Sichuan, Xizang.


有柄柴胡 you bing chai hu

Plants 50–70 cm, perennial. Taproot long-fusiform, dark brown. Stem usually solitary, erect, usually little-branched above, base without fibrous remnant sheaths. Basal leaves several, narrowly long-lanceolate or long-elliptic, 9–14 × 1–1.3 cm, thinly papery, 7–9-nerved, margin tinged red, base tapering into long petioles, clasping. Upper leaves short-petiolate; blade elliptic or lanceolate, 7–12 × 1–2 cm, apex obtuse-acute, apiculate. Apical leaf small, sessile. Umbels few, 4–8 cm across; bracts 1–3, elliptic, 4–9 × 2–4 mm, apiculate; rays 8–11, 0.5–4 cm, unequal, slender; bracteoles 5–7, ovate-lanceolate, 5–11 × 1.5–3 mm, unequal, membranous, apex acute, apiculate, equaling or slightly exceeding the flowers; umbellules 4–6 mm across, 8–16-flowered; pedicels 1.2–2.2 mm. Petals yellow. Stylodium low-conic, yellow. Fruit ellipsoid, dark brown, 3.5–5 × 1.6–2.1 mm; ribs pale brown, slightly prominent; vitiae 3 in each furrow, 4 on commissure. Fl. and fr. Jul–Sep.

- Open forests, grassy places on mountain slopes; 1900–4200 m. Sichuan, NW Yunnan.

This species has reputed medicinal value. See the taxonomic note under Bupleurum candollei.


长茎柴胡 chang jing chai hu

Plants 50–70 cm, perennial. Rhizome horizontal, little-branched, gray-brown. Stems solitary or several, erect, little-branched above, branches short or elongate, base without fibrous remnant sheaths. Basal leaves narrow-linear, lanceolate or oblanceolate, 10–12 × 0.5–2 cm, 5–11-nerved, base tapering into a conspicuous petiole, apex acute or acuminate. Cauline leaves sessile; blade linear-lanceolate to ovate-lanceolate, smaller, base broad-cordate and clasping, apex long-acuminate or acute. Umbels 3–8 cm across; bracts 0 or 2–3, lanceolate or ovate, 4–15 × 3–8 mm, unequal, 9–15-nerved; rays 3–12, 2.5–6 cm, unequal, somewhat stout, ribbed; bracteoles (5–)10–12, narrow-lanceolate or suborbicular, ca. 7 × 5 mm, longer than the flowers; umbellules ca. 8 mm across, ca. 20-flowered; pedicels 1.5–2 mm. Petals dark purple or yellow. Stylodium low-conic, discoid, dark purple. Fruit ovoid or ellipsoid-ovoid, gray-brown, 3.5–5 × 1–1.5 mm; ribs prominent, acute; vitiae 3 in each furrow, 4 on commissure. Fl. and fr. Jul–Sep.

Forests, grassy places on mountain slopes; 1000–4000 m. S Gan-su, W Hubei, Ningxia, Shannxi, Shansi, NE and W Sichuan, E Xizang, NW Yunnan [India, Kashmir, Nepal, Pakistan].

All four varieties have reputed medicinal value. See the taxonomic note under Bupleurum candollei.
APIACEAE

Stem solitary. Lower leaves lanceolate, 2–12 × 0.5–1.5 cm, sessile, base broad, clasping. Petals dark purple.

Grassy places on mountain slopes; 2500–3600 m. W Hubei, SE Qinghai, SW Sichuan, E Xizang, NW Yunnan [India, Kashmir, Nepal, Pakistan].


**采购柴胡** bao jing chai hu

Stems several, unbranched or few-branched above. Lower leaves linear, 9–18 × 0.6–1.2 cm, sessile, clasping. Middle leaves long-lanceolate, sessile, base round or cordate. Upper leaves narrow-ovate, base deep cordate. Rays (4–)7–9. Petals yellow.

- Forests on mountain slopes; 2500–2700 m. NW Yunnan.


**空心柴胡** kong xin chai hu

*Bupleurum candollei* Franchet (1894), not Wallich ex de Candolle (1830).

Stems usually several, rarely solitary, younger parts often purplish-tinged. Basal leaves narrowly oblong-lanceolate, 10–19 × 0.7–1.5 cm. Middle leaves lanceolate, base slightly narrow and clasping. Bracts 1–2, deciduous, umbellules 8–15-flowered. Petals yellow.

- Forests, grassy places on mountain slopes; 1000–4000 m. S Gansu, W Hubei, Ningxia, S Shaanxi, NE and W Sichuan, NW Yunnan.


**秦岭柴胡** qin ling chai hu

*Bupleurum giraldii* (H. Wolff) Koso-Poljansky.


- Grass, grassy places on mountain slopes; 2600–3300 m. Ningxia, Qinghai, Shaanxi, Shanxi.


**贵州柴胡** gui zhou chai hu

Plants 20–40 cm, perennial. Rhizome slender. Stem solitary, erect, tinged purple, especially upper parts and around nodes, base without fibrous remnant sheaths. Basal leaves numerous; blades narrowly spatulate to lanceolate, base tapering into a long petiole. Middle leaves usually in two rows, sessile; blades obovate-lanceolate, 7–12 × 1–1.5 cm, nerves 7–9, base narrow and clasping, apex obtuse-acute, often tinged purple. Upper leaves long-elliptic, 1–4 × 0.5–1 cm. Umbels 2.5–4 cm across, terminal and axillary, base of terminal umbel often bearing a lateral umbel which overtops the terminal; bracts 1, broad-obovate, 5–12 × 2–6 mm, deciduous; rays 5–6, 1.5–2.5 cm, unequal; bracteoles 5, broad-obovate, 4–5 × 2.2–3 cm, apex rounded, mucronate, tinged purple, equaling or slightly shorter than umbellules in fruit; umbellules ca. 8 mm across, 10–14-flowered; pedicels ca. 2 mm. Fruit ovoid or ellipsoid, brown, 3.5–4.5 × 2.5–2.7 mm; ribs thick, pale brown; vittae (3–)4–5 in each furrow, 4–6 on commissure. Fl. and fr. Aug–Oct.

- Grassy slopes in sunny places; ca. 2100 m. NE Guizhou (Fanjing Shan).

This poorly known taxon is recorded only from a few collections.


**锥叶柴胡** zhu i ye chai hu

Plants 15–30 cm, perennial. Rootstock, branched, thickened and woody at apex. Stems many, slender, few-branched above, base densely clothed with remnant fibrous sheaths. Leaves all linear, 7–16 × 0.1–0.3 cm, 3–5-nerved, base slightly tapering into a short petiole, apex mucronate. Cauline leaves sessile, slightly clasping. Umbels 1–2 cm across; bracts 1–3, or absent, 1–3 × ca. 1 mm; rays 4–7, 4–15 mm; bracteoles 5, lanceolate, 1–3 × 0.5–0.7 mm, shorter than flowers; umbellules 3–6 mm across, 7–13-flowered; pedicels 0.7–1.3 mm. Petals bright yellow, tip shallowly 2-lobed. Stylodium long-conic, dark yellow. Fruit broadly ovoid, bluish-brown, 2.5–3 × ca. 2 mm; ribs prominent; vittae 3 in each furrow, 2–4 on commissure, very small, obscure when mature. Fl. and fr. Jul–Sep.

Forest margins, gravelly or sunny mountain slopes, dry stony grasslands; 600–1600 m. Hebei, N Heilongjiang, Nei Mongol, N Shaanxi, N Shanxi [Afghanistan, Japan, Korea, Mongolia, Russia].

The roots of at least var. *bicaule* are used in traditional Chinese medicine.

1a. Stems several to many, leaves linear, 0.1–0.3 cm broad ...................................... 18a. var. *bicaule*

1b. Stems very numerous, usually ca. 20, caespitose, leaves linear-lanceolate, ca. 4 mm broad ...................................... 18b. var. *latifolium*

18a. *Bupleurum bicaule* var. *bicaule*

**锥叶柴胡(原变种)** zhu i ye chai hu (yuan bian zhong)

*Bupleurum falcatum* Linnaeus var. *bicaule* (Helm) H. Wolff.

Stems several to many. Leaves all linear, 0.1–0.3 cm broad.

Sunny mountain slopes, dry stony grasslands; 600–1600 m. Hebei, Nei Mongol, N Shaanxi, N Shanxi [Afghanistan, Japan, Korea, Mongolia, Russia].


**呼玛柴胡** hu ma chai hu

Stems very numerous, usually ca. 20 cm, caespitose. Leaves linear-lanceolate, ca. 4 mm broad.

- Forest margins, gravelly mountain slopes; ca. 600 m. N Heilongjiang (Da Hinggan Ling).

This poorly known taxon is recorded only from a few collections.


短茎柴胡 daun jing chai hu

Plants 2–10 cm, bluish gray-green, perennial. Root thickened at apex into woody caudex. Stem decumbent or ascending, branches flexuose, base densely clothed with remnant sheaths. Basal leaves numerous; petiole tinged purple; blade linear or narrowly oblong-lanceolate, 2–5 × 0.1–0.4 cm, 3–5-nerved, thickly papery, apex acute. Cauline leaves sessile, clasping; blades shorter, slightly broader. Umbels 1–2.5 cm across; bracts 1–4, ovate-lanceolate, 4–9 × 1–2.5 mm, unequal; rays 3–6, 1.5–4 mm, unequal; bracteoles 5(–7), ovate, 4.5–5 × 1.2–2 mm, equaling or slightly exceeding umbellules, 3-nerved, apex acute, axially glaucous; umbellules 4–6 cm across, 10–15-flowered; pedicels ca. 1 mm. Petals yellow. Stylodium low-conic, dark yellow. Fruit ovoid-oblong, brown, 3.5–4 × 1.8–2.5 mm; ribs prominent; vittae 3(–4) in each furrow, 4 on commissure. Fl. Jun–Jul, fr. Aug–Sep.

- Sunny mountain slopes, open gravels, sandy soils, riversides; 3000–3700 m. E Qinghai (Gonghe, Xinghai).


细叶柴胡 chi guo chai hu

Plants ca. 20 cm, perennial. Root slender, pale brown, little-branched. Stems several, slender, erect, base without fibrous remnant sheath. Lower leaves sessile, clasping; blade oblong-lanceolate, ca. 20 × 2.5 mm, nerves 11–13, apex acuminate. Middle leaves elliptic-lanceolate, apex obtuse-acute. Umbels 2–5 cm across; bracts 2–3, elliptic, 7–10 × 1.8–3 mm, 5–7-nerved, apex acute or acuminate; rays of terminal umbel 3, 2–5 cm, unequal, rays of lateral and lower umbels 1–2, ca. 2 cm; bracteoles 3–5, linear-lanceolate, 4.5–1.2–1.5 mm, shorter than umbellules in fruit; umbellules 3–8 mm across, (4–)8–10-flowered; pedicels 1.2–2.5 mm. Petals yellow. Stylodium low-conic, dark yellow. Fruit oblong, ca. 5 × 2 mm; ribs all broadly winged, equal; vittae 3(–4) in each furrow, 2 on commissure. Fl. and fr. Aug–Sep.

- Mountain slopes; ca. 3900 m. S Xinjiang (Nyalam).

This rather poorly known species is recorded only from a few localities. It is similar to *Bupleurum stewartianum* Nasir, from Pakistan, but differs in having fewer and longer rays, and fruit with broader wings.


簇生柴胡 cu sheng chái hu

Plants 8–20 cm, perennial, tinged pink throughout. Taproot stout, fusiform, apex woody, forming a thick caudex. Stems very numerous, slender, base without fibrous remnant sheaths. Basal leaves numerous, rosette-caespitose, sessile and claspers; blade narrowly lanceolate, 2.5 × 0.2–0.5 cm, 5–11-nerved, acuminate. Cauline leaves reduced upwards. Terminal umbels 4–6 cm across, lax; bracts 5–6, linear, 1.2–3 × 0.5–2 mm; rays 4–7, 3–6 cm, very unequal, slender; bracteoles (5–)6–8, lanceolate or ovate-elliptic, 3.5–1–1.7 mm, apiculate; umbellules 4–7 mm across, 14–20-flowered; pedicels 1.2–1.8 mm. Petals yellow, yellow-green, or tinged purple, ovate-elliptic, midvein dark. Stylodium low-conic, yellow or purplish. Fruit ovoid-oblong, reddish-brown, 1.8–3.2 × 1.8–2 mm; ribs slightly prominent; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Jul–Sep.

- Sunny mountain slopes, open gravels, sandy soils, riversides; 3000–3700 m. E Qinghai (Gonghe, Xinghai).


新疆柴胡 xin jiang chai hu


Plants 40–90 cm, perennial. Taproot stout, woody, thickened into a several-branched caudex. Stems numerous, branching above, base without fibrous remnant sheaths. Basal leaves many, caespitose, sessile; blade linear to linear-lanceolate, 8–12 × 0.2–0.4 cm, 3-nerved, base slightly narrow, clasping. Middle leaves linear-subulate. Upper leaves subulate, ca. 5 × 1 mm, 1–3-nerved. Inflorescence copiously branched, umbels 1.5–3 cm across; bracts 2–3, linear or lanceolate, 0.5–2 mm; rays 3–5 (=7), 5–22 mm, unequal; bracteoles 5, elliptic or lanceolate, 1.5–2.5 × ca. 0.5 mm, thick, shorter than or equaling pedicels; umbellules 4–7 mm across, 5–10-flowered; pedicels 2–3 mm, exceeding the bracteoles in fruit. Petals yellow. Stylodium low-conic, dark yellow. Fruit oblong, 3.5–4.5 × 1.5–2 mm; ribs narrowly winged; vittae large, 1 in each furrow, 2 on commissure. Fl. Jun–Jul, fr. Aug–Sep.

- Mountain slopes; ca. 1500 m. Xinjiang (Urumqi) [Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan].

This species has reputed medicinal value (in Xinjiang).


纤细柴胡 xian xi chai hu

*Bupleurum falcatum* Linnaeus var. *gracillimum* (Klotzsch) H. Wolff.

Plants 6–30(–40) cm, perennial. Taproot slender. Stems numerous, caespitose, decumbent, slender, branching at base, yellow or tinged pink, base without fibrous remnant sheaths. Leaves sessile; blades linear, 1–6 × 0.2–0.6 cm, 7–11-nerved, gray-green, base slightly dilated, almost clasping, apex acuminate. Middle leaves shorter and broader, lanceolate, thinly 15–19-nerved. Umbels 1–3 cm across; bracts 3–4, ovate or elliptic, 4.9 × 2–4 mm, unequal; rays 3, 0.5–2 cm, rather thick, unequal; bracteoles (1–)3–5, ovate or lanceolate, 1.5–5 × 0.7–2.5 mm, very unequal; umbellules ca. 5 mm across, 3–6–9-flowered, only 2–3 flowers develop into fruit; pedicels ca. 1 mm. Petals yellow or dark purple. Stylodium low-conic, dark yellow or purplish. Fruit ellipsoid or long-ovoid, brown, 3.5–
This species has reputed medicinal value.


**天山柴胡** tian shan chai hu

Plants 50–80 cm, perennial. Root fibrous or somewhat fleshy. Stems several, sometimes tinged purple, short-branched above, base without remnant sheaths. Basal leaves linear to narrowly lanceolate, 9–19 × 0.2–0.4 cm, 5–7-nerved, thick-papery, margin narrowly membranous, base tapering into petiole and clasping, apex acuminate. Cauline leaves linear-lanceolate, 6–10 × 0.4–0.6 cm, almost clasping. Apical leaves small. Umbels 2–4 cm across; bracts 2–3, lanceolate, 5–15 × 3–4 mm, unequal, deciduous; rays (3–)5–7–(15), 2–4 cm, unequal; bracteoles 7–9, ovate-lanceolate, 4–7 × 1.5–2 mm, equal, slightly exceeding umbellules in flower, equaling or slightly shorter than umbellules in fruit; umbellules 8–13 mm across, 15–30-flowered, capitulate in fruit; pedicels 1.5–2.5 mm. Petals yellow or brownish-yellow. Stylodium low-conic, brownish-yellow. Fruit oblong, dark brown, 3–4 × 2 mm; ribs pale brown, prominent; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Jul–Sep.

Grassy slopes, stony places; 1700–2000 m. W Xinjiang (Tian Shan) [Kazakhstan, Kyrgyzstan].

This species has reputed medicinal value (in Xinjiang).

27. *Bupleurum scorzonerifolium* Willdenow, Enum. Pl. Suppl. 30. 1814 ["scorzoneraeafolium"].

**红柴胡** hong chai hu

*Bupleurum falcatum* Linnaeus subsp. *scorzonerifolium* (Willdenow) Koso-Poljansky; *B. falcatum var. scorzonerifolium* (Willdenow) Ledebour; *B. sinensium* Gandoger.

Plants 30–60 cm, perennial. Taproot stout, dark reddish-brown, branched. Stems 1–3, flexuose, greatly dichotomously branched, base clothed with fibrous remnant sheaths. Basal leaves linear, 6–16 × 0.2–0.7 cm, thick-papery, rigid, nerves 3–5, prominent abaxially, margin white cartilaginous, base slightly narrowed and clasping. Upper leaves small. Umbels numerous, 1.2–4 cm across; bracts 1–3, subulate, 0.5–4 × 0.2–0.6 mm, unequal, deciduous; rays (3–)4–6–(8), 1–2 cm, very slender, spreading; bracteoles 5, lanceolate, 2.5–4 × 0.5–1 mm, equaling or slightly exceeding umbellules; umbellules 2–5 mm across, (6–)9–11–(15)-flowered; pedicels 0.2–1 mm. Petals yellow. Stylodium low-conic, dark yellow. Fruit ellipsoid, dark brown, 2.5–3–1.5 × 2 mm; ribs pale, prominent; vittae 5–6 in each furrow, 4–6 on commissure. Fl. and fr. Jul–Sep. n = 6*.

Shrub forest margins, sunny mountain slopes, dry grasslands; 100–2300 m. Anhui, Gansu, Guanxi, Hebei, Heilongjiang, Jiangsu, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi [Japan, Korea, Mongolia, Russia].

This *Bupleurum* is one of two primary species the roots of which are used for the major traditional Chinese medicine "chai hu" (see also *B. chinense*).

Two forms are endemic in China: f. *longiradiatum* R. H. Shan & Yin Li (Acta Phytotax. Sin. 12: 282. 1974), distinguished by having rays longer, 11–35 mm, and bracts larger, 4–7 mm (Hebei, Liaoning, Qinghai); and f. *pauciflorum* R. H. Shan & Yin Li (loc. cit.), distinguished...
by having rays usually fewer, 2–3(–5), and shorter, 3–12 mm, and umbellules only 4–6(–8)-flowered (Gansu, n = 6*).


马尔康柴胡 xian ye chai hu

*Bupleurum falcatum* Linnaeus var. angustissimum Franchet, Pl. David. 1: 138. 1883; *B. falcatum f. angustissimum* (Franchet) C. Pei & R. H. Shan; *B. falcatum subf. angustissimum* (Franchet) H. Wolff; *B. scorzonerifolium* Willdenow subsp. angustissimum (Franchet) Kitagawa; *B. scorzonerifolium var. angustissimum* (Franchet) Y. Hui Huang.

Plants 15–80 cm, perennial. Taproot long, slender, woody, reddish-brown. Stem slender, dichotomous-branched throughout, base clothed with fibrous remnant sheaths. Lower leaves sessile, linear, 6–18 × 0.8–1 cm, thick, rigid, 3–5-nerved, margins narrowly reflexed, apex and base tapering. Apical leaves short. Umbels numerous, 1.5–2 cm across, bracts 1 or absent, subulate, 0.5–2 × 0.2–0.5 mm, unequal; rays 5–7, 1.5–3 cm, unequal; bracteoles 5, linear-lanceolate, 1.2–2.5 × 0.5–0.7 mm, longer than pedicels in fruit; umbellules ca. 5 mm across, 12–16-flowered; pedicels ca. 0.8 mm. Petals yellow, midvein dark. Stylodium low-conic, dark yellow. Fruit ellipsoid, ca. 2 × 1 mm; ribs prominent; vitiae not recorded. Fl. Jun-Jul, fr. Aug-Sep.

Dry grasslands; 1600–2000 m. Gansu, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi [Mongolia].

This species is widely used as a substitute for the Chinese medicine “chai hu.”


银川柴胡 yin zhou chai hu

Plants 25–50 cm, perennial. Taproot long, stout, woody, pale reddish-brown, digitate-branched, thickened at apex. Stems numerous, slender, tinged purple at base, branching above, base without fibrous remnant sheaths. Basal leaves oblong-lanceolate, 5–8 × 0.2–0.5 cm, 3–5-nerved, deciduous, base tapering into long petiole, apex acute, apiculate. Middle leaves short-petiolate. Umbels numerous, 10–18 mm across; bracts 1 or 2, or absent, subulate, ca. 2 mm; rays (3–)4–6(–9), slender, 4–11 mm; bracteoles 5, linear, 1–2 × ca. 0.2 mm, shorter than pedicels in fruit; umbellules 2.5–4 mm across, 6–9-flowered; pedicels ca. 2 mm. Petals yellow, midvein brown. Stylodium low-conic, yellow. Fruit ovoid, brown, 2.6–3 × 2–2.2 mm, glaucous, base rounded; ribs inconspicuous; mericarps pentagonal in cross section; vitiae 3 in each furrow, 4 on commissure. Fl. Aug-Sep. fn. Aug-Sept.

Dry mountain slopes; 500–1900 m. Gansu, Nei Mongol, Ningxia, Shaanxi.

This species is widely used as a substitute for the Chinese medicine “chai hu.”


马尾柴胡 ma wei chai hu

Plants 50–100 cm, biennial. Taproot yellowish-brown, elongate-terete, unbranched. Stem solitary, several-branched above, slender, base purplish-tinged, without fibrous remnant sheaths. Basal leaves numerous, narrowly linear, 16–30 × 0.25–1 cm, thin-papery, abaxially slightly glaucous, 5-nerved, base tapering into petiole, margin white scarious. Cauline leaves shorter, sessile, somewhat clasping. Umbels numerous, 1.2–3 cm across; peduncles and rays very slender; bracts 3–5, very small, 0.2–2 × 0.1–0.4 mm, lanceolate or squamose; rays (3–)4–6(–9), 7–50 mm, unequal; bracteoles 5, elliptic or spatulate, 1.5–2.5 × 0.5–1 mm, mostly shorter than umbellules in fruit; umbellules 2.5–5 mm across, 6–12-flowered; pedicels 1.5–1.8 mm. Petals yellow, midvein dark. Stylodium low-conic, yellow. Fruit ovoid, brown, 2.6–3 × 2–2.2 mm, glaucous, base rounded; ribs inconspicuous; mericarps pentagonal in cross section; vitiae 3 in each furrow, 4 on commissure. Fl. Jul-Aug, fr. Aug-Oct.

Among shrubs, open slopes, roadsides; 1400–3200 m. S Gansu, W Sichuan, Xizang.

This species is used as a regional substitute for the Chinese medicine “chai hu.”


太白柴胡 tai bai chai hu

Plants 50–75 cm, perennial. Taproot long-terete, unbranched. Stem solitary, erect, slender, branched above, base tinged purple, without fibrous remnant sheaths. Basal leaves linear, 5–7 × 0.3–0.5 cm including petioles, 5–7-nerved, thinly papery, abaxially greenish-white. Cauline leaves similar to basal, shortly petiolate. Apical leaves small, sessile. Umbels 3–4 cm across; bracts 1–2, lanceolate, 1–4 × 0.5–1.5 mm, unequal; rays (4–)6–10, 1–3 cm, unequal, very slender, spreading; bracteoles 5–6,
elliptic, 1–2 × 0.5–1 mm, membranous; umbrellas 4–5 mm across, 10–14-flowered; pedicels very slender, 5–7 mm in flower, greatly exceeding the bracteoles. Petals yellow. Stylodinium low-conic, discoid, yellow. Fruit ellipsoid, brown, ca. 4 × 2 mm, slightly glaucous; ribs inconspicuous; mericarps near round in cross section; vittae 3 in each furrow, 4 on commissure. Fl. and fr. Aug–Sep.

- Mountain slopes; ca. 2000 m. SW Shaanxi (Taibai Shan).

This species is used as a regional substitute for the Chinese medicine “chai hu.” It is a rather poorly known taxon, recorded only from a few collections.


汶川柴胡

Plant 40–90 cm, perennial. Taproot long, thickened, yellowish-brown, fusiform, little-branched. Stem solitary, much-branched throughout, branches long, slender, remote, base clothed with fibrous remnant sheaths. Basal leaves numerous, rosette-caespitose; blades oblong-lanceolate, 5–12 × 0.2–0.4 cm, 3–5-nerved, tapering into petiole, base dilated, clasping. Lower leaves linear. Middle and upper leaves 1–8, subulate to squamose, 0.5–1 mm. Umbels numerous, remote, very small, ca. 4 mm across; bracts 2–3, subulate or squamose, 0.3–1.5 × 0.1–0.3 mm, unequal, rigid; rays (1–)2–3, 2–35 mm, filiform, very unequal; bracteoles 5–6(–7), obovate or elliptic, 0.6–1 × 0.3–0.5 mm, thick, shorter than flowers; umbellules 2–3 mm across, 1–4-flowered; pedicels 3–6 mm in flower, elongating in fruit. Petals yellow, midvein dark yellow. Stylodinium low-conic, yellow. Fruit ovoid, brown, ca. 2 × 1.5 mm; ribs prominent; vittae 2–3 in each furrow, 3–4 on commissure. Fl. and fr. Aug–Oct.

- Mountain slopes, grasslands; 1400–1800 m. NW Sichuan (upward from Min Jiang drainage basin).

This species is used as a regional substitute for the Chinese medicine “chai hu.”


小柴胡

Herbs 10–100 cm, annual, or short-lived perennial. Root grayish-yellow, thin, woody, branched. Stem tinged purple, much branched throughout, branches slender, ascending, base without fibrous remnant sheaths. Leaves sessile, oblong-lanceolate or linear, 3–8 × 0.4–0.8 cm, 7–9-nerved, base slightly narrow, sometimes punctate with oil glands along veins and margin. Inflorescence profusely branched, umbels numerous, small, 1–2 cm across, lax; bracts 2–4, lanceolate or elliptic, 3–6 × 1–2 mm, unequal, 5–7-nerved; rays 2–5(–7), 0.5–2 cm, unequal, very slender; bracteoles 5, lanceolate or elliptic, 3–4 × 1–1.5 mm, equal, 3-nerved, apex apiculate, equaling or slightly longer than flowers; umbellules 1–1.3 mm across, 5–11-flowered; pedicels 0.5–1.5 mm. Petals yellow-green, suborbicular, midvein dark. Stylodinium low-conic, dark yellow. Fruit broad-ovoid or ellipsoid, brown, 2–2.5 × ca. 1.5 mm; ribs pale yellow, prominent; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Sep–Oct.

- Forest margins, mountain slopes, grasslands, sunny slopes, shady wet places, dry stony areas; 600–2900 m. Hubei, Guangxi, Guizhou, Sichuan, S Xizang, NW Yunnan [Bhutan, N India, Kashmir, Malaysia, Myanmar, Nepal, Pakistan, Sikkim, Thailand, Vietnam].

All three varieties have reputed medicinal value.

1a. Plants annual, 10–25 cm, usually reddish throughout .................................. 34b. var. hamiltonii

1b. Plants biennial or perennial, usually 50–100 cm high, green.

2a. Plants ca. 100 cm; bracts 2–3, equal; bracteoles usually 3, exceeding the flowers ....................... 34c. var. pauciflorus

2b. Plants 50–80 cm; bracts usually 4; bracteoles 5, equaling or slightly exceeding the flowers ........... 34a. var. hamiltonii

34a. Bupleurum hamiltonii var. hamiltonii

小柴胡（原变种） xiao chai hu (yuany bian zhong)

Bupleurum hamiltonii Buchanan-Hamilton var. hamiltonii Fl. Nepal. 182. 1825, not Salisbury (1796).

Plants 50–80 cm, biennial; bracts usually 4; bracteoles 5, equaling or slightly exceeding the flowers.

Grasslands, sunny slopes, dry stony areas; 600–2900 m. Hubei, Guangxi, Guizhou, Sichuan, S Xizang, NW Yunnan [Bhutan, N India, Kashmir, Malaysia, Myanmar, Nepal, Pakistan, Sikkim, Thailand, Vietnam].


矮小柴胡 ai xiao chai hu


Plants 10–25 cm, annual, usually reddish throughout. Branches numerous, short. Leaves small, thick-papery, 1–3 × 0.15–0.3 cm.

- Forest margins, mountain slopes, grasslands; 1100–2300 m. SW Sichuan, NW Yunnan [Vietnam].

Records of this variety from Vietnam require confirmation.


三苞柴胡 san bao chai hu

Plants 1 m, perennial. Stem stout. Leaves large, 6–8 × ca. 0.8 cm. Bracts 2–3; bracteoles usually 3, unequal, exceeding the flowers.

- Mountain slopes, shady wet places; ca. 1300 m. W Guizhou (Bijie).

35. Bupleurum marginatum Wall. ex de Candolle, Prodr. 4: 132. 1830.

竹叶柴胡 zhu ye chai hu

Plants 25–120 cm high, perennial. Taproot stout, woody, branched. Stem rigid, base woody, usually tinged purple, without fibrous remnant sheaths. Leaves long-lanceolate to linear,
10–16 × 0.6–1.4 cm, thinly coriaceous, nerves 9–13, base tapering and clasping, margin conspicuously white-cartilaginous, apex acute or acuminate, apiculate. Upper leaves small. Inflorescence much-branched, umbels numerous, 1.5–4 cm across, lateral umbels often overlapping the terminal; bracts 2–5, lanceolate or squamose, 1–4 × 0.2–1 mm, unequal; rays 3–4(–7), 1–3 cm, unequal; bracteoles 5, lanceolate, 1.5–2.5 × 0.5–1 mm, shorter than pedicels, apex apiculate, margin white-scarious; umbellules 4–9 mm across, (6–)8–10(–12)-flowered. Petals pale yellow. Stylodium low-conic, dark yellow. Fruit oblong, brown, 3.5–4.5 × 1.8–2.2 mm; ribs prominent; vitae 3 in each furrow, 4 on commissure. Fl. Jun–Sep, fr. Sep–Nov. 4

Forests, mountain slopes, grasslands, river banks, roadsides; 700–4000 m. S Gansu, Guizhou, Hubei, Sichuan, Xizang, Yunnan [Bhutan, NE India, Kashmir, Myanmar, Nepal, Pakistan, Sikkim].

The taxonomic status of var. marginatum requires further study. Some authors treat it as conspecific with Bupleurum marginatum without any infraspecific designation, but the difference in chromosome numbers favors treating it as a separate taxon, perhaps as a separate species.

35a. Bupleurum marginatum var. marginatum

竹叶柴胡 zhu ye chai hu (yuan bian zhong)

Bupleurum falcatum Linnaeus subsp. marginatum (Wallich ex de Candolle) H. Wolff, B. falcatum var. marginatum (Wallich ex de Candolle) C. B. Clarke.

Plants 50–120 cm. Leaves broad, 10–16 × 0.6–1.4 cm, cartilaginous margin broad. Bracteoles shorter than pedicels. Fl. Jun–Sep, fr. Sep–Nov. n = 12*.

Forests, mountain slopes, grasslands; 700–3100 m. S Gansu, Guizhou, Hubei, Sichuan, E and S Xizang, Yunnan [Bhutan, NE India, Kashmir, Myanmar, Nepal, Pakistan, Sikkim].


窄竹叶柴胡 zhai zhu ye chai hu (yuan bian zhong)


Plants 25–60 cm. Leaves narrow, 3–10 × 0.3–0.6 cm, cartilaginous margin narrow. Bracteoles longer than the pedicels. Fl. Aug–Sep, fr. Sep–Oct. n = 7*.

● Alpine forests, river banks, roadsides; 2300–4000 m. Qinghai, Sichuan, Xizang, Yunnan [Bhutan, NE Nepal].

The taxonomic status of var. stenophyllum requires further study. Some authors treat it as conspecific with Bupleurum marginatum without any infraspecific designation, but the difference in chromosome numbers favors treating it as a separate taxon, perhaps as a separate species.


柴首 chai shou

Plants 0.5–1 m, perennial. Taproot gray-brown, stout, digitate-branched, capitulate, woody when old forming a thickened caudex. Stems many, tufted, base without fibrous remnant sheaths. Basal leaves numerous, sub sessile or shortly petiolate; blade oblanceolate, 4–6 × ca. 0.5 cm, dark gray-green, glabrous, nerves 7, margin white cartilaginous, apex obtuse. Cauline leaves lanceolate to elliptic, very unequal at the same node, 1.2–9 × 0.3–1.2 cm, 5-nerved, usually reflexed. Umbels numerous, small, terminal umbels 1–2(–4) cm across, lateral umbels less than 1 cm; bracts 2–4, linear, 0.6–7 × 0.3–1 mm, unequal; rays 3–5, 0.2–3 cm, slender when young, thickening with age; bracteoles 5, ovate or obovate-elliptic, 1.2–2.8 × 0.5–0.8 cm, equaling or exceeding the umbellules, nerves 3; umbellules ca. 5 mm across, 4–10-flowered; pedicels ca. 1 mm. Petals yellow. Stylodium low-conic, yellow. Fruit ovoid-ellipsoid, brown, 3–3.5 × ca. 2 mm; ribs prominent; vitae 3 in each furrow, 4 on commissure. Fl. and fr. Aug–Oct.

● Among shrubs, sunny slopes; 2100–2700 m. NW Sichuan.

The multi-branched and thickened rootstock is used as the traditional Chinese medicine “chai shou” (柴首). The crude drug looks like a large head, hence the name “shou” (head).


细柄柴胡 xi bing chai hu

Plants 50–90 cm, perennial. Root long, thickened, branched. Stem usually solitary, erect, branched at base, base without fibrous remnant sheaths. Basal leaves oblongolate, 8–18 × 1–1.4 cm including petioles, base narrow, clasping, apex acute. Cauline leaves sub sessile, oblanceolate or narrowly long-elliptic, 5–9 × 0.7–1 cm, abaxially grayish-green, 5–7-nerved, apex obtuse, apiculate. Upper leaves sessile, small, lanceolate. Umbels 1.5–4 cm across; bracts 3–5, elliptic or ovate, 3–7 × 1–3 mm, unequal; rays 2–3(–5), thin and rigid, 1–3 cm, unequal; bracteoles 4–5, green, 3–4 × 2.5–2.5 mm, margin membranous, exceeding umbellules in flower, but shorter in fruit; umbellules ca. 5 mm across, 5–10-flowered; pedicels ca. 1 mm. Petals pale yellow, midvein dark. Stylodium low-conic, yellow. Fruit oboolong-ellipsoid, brown, ca. 4 × 1.5 mm, glaucous; ribs prominent; vitae 3 in each furrow, 2–4 on commissure. Fl. and fr. Jun–Aug.

● Forests, shady valleys; 1400–1700 m. Chongqing (Nanchuan).

This poorly known taxon is recorded only from a few collections.


北柴胡 be chai hu

Bupleurum chinense Franchet (1883), not de Candolle (1830); B. chinense de Candolle f. vanheurckii (Müller Argoviensis) R. H. Shan & Yin Li; B. falcatum Linnaeus f. ensifolium H. Wolff; B. togasii Kitagawa; B. vanheurckii Müller Argoviensis.

Plants 50–85 cm, perennial. Root stout, elongate, brown, woody, usually branched. Stem solitary or several, dichotomously much-branched above, base without fibrous remnant...
sheaths. Basal leaves oblongate or narrow-elliptic, 4–7 × 0.6–0.8 cm, base tapering into petioles, apex acuminate. Middle leaves broadly linear-lanceolate, 4–12 × 0.6–1.8(–3) cm, 7–9-nerved, abaxially glaucous, apex apiculate. Apical leaves small. Umbels numerous, 2–6 cm across; peduncles slender, greatly spreading forming a large loose panicle; bracts 0 or 2–3, linear, 1–5 × 0.5–1 mm, 3-nerved; rays 3–8, very slender, 1–3 cm, unequal; bracteoles 5, lanceolate, 3.3–3.5 × 0.6–1 mm, shorter than flowers; umbellules 4–6 mm across, 5–10-flowered. Petal bright yellow. Stylodium low-conic, discoid, dark yellow. Fruit oblong, brown, ca. 3 × 2 mm; ribs prominent, narrowly winged, wings pale brown; vitiae 3(–4) in each furrow, 4 on commissure. Fl. and fr. Sep–Oct. n = 6*.

- Grasslands, stream banks, sunny slopes, roadsides; 100–2700 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Zhejiang.

This Bupleurum is one of two primary species the roots of which are used for the major traditional Chinese medicine “chai hu” (see also B. scorzonerifolium). It is a very widespread species, within which three forms are currently recognized: B. pekinesis (Franchet ex Hemsley) R. H. Shan & Yin Li (Acta Phytotax. Sin. 11: 293. 1974; B. pekinesis Franchet ex Hemsley, J. Linn. Soc., Bot. 23: 327. 1887), distinguished by having leaves rigid, papery, both surfaces gray-green; and f. chiliosciadium (H. Wolff) R. H. Shan & Yin Li (loc. cit.; B. falcatum Linnaeus var. chiliosciadium H. Wolff, Acta Horti Gothob. 2: 303. 1926), distinguished by having peduncles much-branched and umbellules numerous, small; and f. octoradiatum (Bunge) R. H. Shan & M. L. Sheh (Fl. Reipub. Popularis Sin. 55(1): 293. 1979; B. octoradiatum Bunge, Méms. Acad. Imp. Sci. St.-Pétersbourg Divers Savans 2: 106. 1835), distinguished by having branches non-flexuous, bracteoles elliptic-lanceolate, usually exceeding umbellules in flower and longer than pedicels in fruit, and chromosome number n = 6 + 1 · 2B*.


多枝柴胡 duo zhi chai hu

Plants 15–40 cm, perennial. Taproot slender, woody, annular leaf scars dense. Stem much branched throughout, base without fibrous remnant sheaths. Basal leaves caespitose, linear, 10–20 × 0.2–0.3 cm. Cauline leaves remote, linear, 13–15 × 0.15–0.3 cm. Apical leaves subulate, 3–5-nerved. Inflorescence much dichotomously branched, forming a large panicle; umbels numerous, 1.5–3 cm across; bracts 4–5, elliptic or obovate, 2–8 × 1–3 mm, unequal, 5–7-nerved; rays 3–6, 1–3 cm, unequal, very slender; bracteoles ca. 5, obovate, 3–4 × 2–3 mm, exceeding the flowers; umbellules 1.5–4 mm across, 7–15-flowered; pedicels ca. 1.5 mm. Petals yellow. Stylodium low-conic, yellow. Fruit oblong, brown, 2–3 × 0.2–0.3 cm, 5-nerved; vittae large, usually 2–3 in each furrow, 4 on commissure. Fl. and fr. Jun–Aug.

- Mountain slopes; ca. 2200 m. Ne Yunnan (Huize).

The roots are used in traditional Chinese medicine. This poorly known taxon is recorded only from a few collections.


韭叶柴胡 jiù ye chai hu

Plant 60–100 cm, perennial. Taproot slender, woody, rarely branched. Stem green, erect, base densely marked with annular leaf scars, without fibrous remnant sheaths. Basal leaves numerous, linear, 10–15 × 0.3–0.5 cm, abaxially glaucous, 3–7-nerved, thinly papery, base tapering, apex acuminate. Cauline leaves remote; blade narrowly lanceolate. Apical leaves small, 8–10 × 1.5–5 mm, 3–5-nerved, clasping. Umbels 1.5–4.5 cm across; bracts 5–8, narrow-elliptic, 1.5–5 × 1–2 mm, unequal; rays 4–11, 1–2.5 cm, unequal; bracteoles 5, obovate or broad-elliptic, 2.5–3.5 × 1–2 mm, 3–5-nerved, greenish, exceeding the flowers; umbellules 4–6 mm across, 8–14-flowered; pedicels 1–1.5 mm, slender. Petals yellow. Stylodium low-conic, yellow. Fruit oblong, brown, 2–3 × 1–2 mm; ribs prominent; vitiae 3 in each furrow, 4 on commissure. Fl. Jui–Sep, fr. Aug–Oct.

- Upland slopes; ca. 2000 m. E Yunnan (Kunming, Luxi).

The roots are used in traditional Chinese medicine. This rather poorly known taxon is recorded only from a few collections.


青海柴胡 qing hai chai hu

Plants 30–80 cm, perennial. Root yellowish-brown, woody, slender. Stem erect, green, base without fibrous remnant sheaths. Basal leaves linear, 10–14 × 0.3–0.5 cm, 5-nerved, base tapering into petiole. Cauline leaves linear, 8–10 × 0.4–0.5 cm, 5-nerved, petiolar, clasping. Apical leaves short-linear. Umbels 2–3.5 cm across; bracts 3–4, oblong, 2–7 × 1–2 mm, 5-nerved; rays 6–13, 4–33 mm, unequal; bracteoles 5–7, obvate, 3–4 × 1–2 mm, green, 3-nerved, thickly papery, exceeding the flowers; umbellules 5–8 mm across, 5–26-flowered; pedicels 1–2 mm, very slender. Petals yellow. Stylodium low-conic, yellow. Fruit oblong, brown, 2–3 × ca. 1.5 mm; ribs prominent; vitiae 3 in each furrow, 4 on commissure. Fl. and fr. Jun–Aug.

- Sunny slopes, grassy places; 3200–3700 m. Qinghai (Wanglin).

This rather poorly known taxon is recorded only from a few collections.


台湾柴胡 tai wan chai hu

Plants 30–70 cm, perennial. Rootstock slender, branched. Stems several, erect, much-branched from base, base without fibrous remnant sheaths. Basal and lower leaves petiolar; blade oblong-lanceolate or spatulate, 5–10 × 0.5–1 cm, apex acute. Upper leaves numerous, sessile, oblanceolate to oblong-spatulate, 1–3 × 0.3–0.7 cm, almost embracing, 5–7-nerved. Umbels 3–5 cm across; bracts 2–3, lanceolate, 5–10 × 3–5 mm; rays 5–6, 1–3 cm, unequal; bracteoles 4–5, linear-lanceolate, 1–5 mm; umbellules ca. 1 cm across, ca. 5-flowered; pedicels 1–3 mm. Petals yellow. Stylodium low-conic, yellow. Fruit oblong, brown, 2–3 × 1–1.5 mm; vitiae large, usually 2–3 in each furrow, 4 on commissure. Fl. and fr. Jun–Aug. n = 12*.

- Mountain slopes; ca. 100 m. C and N Taiwan.

This species has reputed medicinal value. It is the only species of Bupleurum reported from Taiwan, but is rather poorly known and is recorded only from a few collections.

**细枝隐棱芹** *zi ran qin shu*

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs annual, small, slender. Root thin. Stem erect, base without remnant sheaths. Leaves 2–3-pinnate or entire, petiole sheath very narrow, margin scarious. Leaves reduced upwards, becoming 3-lobed. Umbels compound, terminal on stem and branches; bracts and bracteoles usually present. Calyx teeth obsolete. Petals white or pinkish, obovate, midvein yellow-brown, prominent, apex narrow, inflexed, abaxially pubescent along midvein. Stylopodium low-conic; styles divergent, ca. twice as long as the stylopodium. Fruit ovoid or subglobose, slightly flattened laterally, mericarp pentagonal in cross section, densely pubescent with clavate-tipped bristles; ribs 5, all rounded or obscure; vitellae large, 1 in each furrow, 2 on commissure. Seed face plane. Carpophore shortly bifid at apex.

Three or four species: C Asia; two species in China.

1a. Plant glabrous; bracts absent or inconspicuous; basal leaves 2-pinnate or 2-ternate ................................................ 1. *A. capillifolia*

1b. Plant pubescent; bracts conspicuous; basal leaves simple, entire, 3-lobed or 3-toothed .......................................... 2. *A. leptoclada*

**细枝隐棱芹 xi yin qin shu**


Plant 7–12(–30) cm, glabrous. Stem sometimes purplish-red in lower parts. Lower leaves shortly petiolate, petioles 3–12 mm; blade 2–3 × 1–2 cm, 2-pinnate or 2-ternate; ultimate segments filiform, linear or narrow-lanceolate, 5–10(–25) × 0.5–1(–2) mm, apex acute. Umbels 1.5–2.5 cm across; bracts absent or rarely 1, lanceolate, ca. 1.2 mm, membranous; rays 3–8, 9–16 mm, slender, divergent; bracteoles 4–6(–7), lanceolate or linear-lanceolate, 1–1.5 mm, shorter than flowers, margins broadly scarious, sometimes ciliate; umbellules 4–8 mm across; pedicels 7–12, 1.5–5 mm, much shorter than flowers, similar to bracts; umbellules ca. 10-flowered, 6–10 mm across, pedicels 2.5–12 mm, longer in fruit. Petals ca. 1 × 0.7 mm. Fruit broadly ovoid, 1.2–1.5 × 0.8–1.1 mm; bristles 0.2–0.3 mm. Fl. Apr–Jun, fr. May–Jun.

Mountain slopes, sandy deserts; 1400–2500 m. W Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan].


**细枝隐棱芹 xi zhi yin qin shu**


Plants 10–40 cm, sparsely pubescent throughout, sometimes glabrescent. Lower leaves petiolute, petiole 1–2 cm; blade lanceolate, oblong-lanceolate or obcuneate in outline, 2–5 × 0.5–2 cm, 3-lobed, 3-toothed, or entire; ultimate segments almost linear, 0.6–40 × 0.6–2.8 mm, base tapering into the long petiole, apex acute. Leaves reduced upwards, ultimate segments becoming narrower. Umbels numerous, usually opposite leaves, 2.5–6 cm across, open; peduncles long, 1.8–5 cm; bracts 2–5, lanceolate-acute, 2–3.5 mm, white membranous, central stripe yellow, abaxially puberulous, margins ciliate; rays 5–10, 1.5–5 mm, very slender, divergent; bracteoles 5–6, ovate-lanceolate, 1–2.5 mm, much shorter than flowers, similar to bracts; umbellules ca. 10-flowered, 6–10 mm across, pedicels 2.5–12 mm, longer in fruit. Petals ca. 1 × 0.5 mm. Fruit ovoid, 2–3 × 1.2–1.8 mm; bristles 0.2–0.4 mm. Fl. Apr–May, fr. Jun.

Grasslands, stable sandy places, cultivated land; ca. 1500 m. W Xinjiang [Afghanistan, Tajikistan, Turkmenistan, Uzbekistan].


**孜然芹属 zi ran qin shu**

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

Herbs, annual, glaucescence throughout, glabrescent except the setulose fruit. Taproot slender. Stem erect, slender, profusely branched. Basal leaves petiolute, base with narrow membranous wing; blade 2-ternate; ultimate segments filiform. Leaves reduced upwards, becoming sessile. Umbels lax, terminal on stem and branches; bracts and bracteoles several, similar to leaves but more cartilaginous, apex subulate, persistent; rays and pedicels very unequal. Calyx teeth subulate, conspicuous, unequal, persistent in fruit. Petals white or pinkish, obovate or oblong, base cuneate, with a small inflexed lobe. Stylopodium conic, attenuate into styles; styles short, reflexed. Fruit oblong-ellipsoid, slightly laterally compressed; primary and secondary ribs prominent, setulose; vitellae 1 in each furrow under secondary ribs, 2 on commissure. Seed face slightly concave. Carpophore 2-parted

Four species: N Africa, and SW Asia, Mediterranean region, North America; one species (introduced) in China.


**孜然芹 zi ran qin**

Plants 10–30(–50) cm. Basal petioles 1–2 cm, sheaths lanceolate, margins white and membranous; blade 3–8 × 2–7 cm; ultimate divisions long-filiform, 15–60 × 0.4–0.7 mm. Umbels many, 2–3 cm across; peduncles 3–10 cm; bracts 2–6(–8), linear or linear-lanceolate, 10–50 × 0.5–1.2 mm, unequal, entire or apex 2–3-fid, usually longer than the rays, margins membranous; rays (1–)3–6, 3–20 mm, rather stout, very unequal; brac-

**芹属 qin shu**

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs, annual or biennial, glabrous. Stem erect, ridged and shallowly fluted. Leaves petiolate, with membranous sheaths; leaf blade pinnate to ternate-pinnately compound. Umbels compound, loose to subcompact; peduncles usually short or abortive; bracts and bracteoles absent; rays few, spreading-ascending or spreading; umbellules few-flowered. Petals white or greenish-yellow, ovate to suborbicular, apex narrow, inflexed. Calyx teeth obsolete. Styles short, erect to reflexed. Fruit globose to ellipsoid, rounded at both ends, slightly compressed laterally, mericarp nearly rounded in cross section, commissural face constricted, glabrous; ribs 5, prominent, acute; vittae 1 in each furrow, 2 on commissure. Seed face plane. Carpophore stout, entire or bifid at the apex.

About 20 species: widespread in the temperate zones of both hemispheres; one species (introduced) in China.


**旱芹 hu qin**

*Apium integrilobum* Hayata.

Plants 15–35 cm, strongly fragrant. Basal leaves oblong to obovate, 7–18 × 3.5–8 cm, 3-lobed to 3-parted; ultimate segments subrhombic, 1.2–2.5 × 0.8–2.5 cm, crenate or serrate. Upper leaves short-petiolate; blade broad-triangular, usually 3-parted, ultimate segments obovate. Umbels 1.5–4 cm across, usually leaf-opposed; peduncles usually short, 4–15 mm, stout, rarely obsolete; rays 3–8(–16), 0.5–2.5 cm, slender; umbellules 7–25-flowered, 6–9 mm across; pedicels 1–1.5 mm. Fruit 1.3–1.5 × 1–2 mm. Fl. and fr. Apr–Jul.

Widely cultivated and adventive throughout China [?native to Asia and Europe; cultivated and adventive worldwide].

This cosmopolitan species is cultivated as a vegetable (celery and celeriac) and is adventive in temperate regions worldwide. It has been cultivated since ancient times and features in the herbal medicinal traditions of many civilizations. All parts of the plant are used in traditional Chinese medicine as the dietary herb “qin” (also known as “han qin” and “qin cai”). There are several cultivated varieties; the cultivated Chinese celery is thought to be close or identical to var. *secalinum* Alefeld.


**欧芹属 ou qin shu**

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs biennial, rarely annual, glabrous. Root narrowly conic. Stem erect, branching above, base without remnant sheaths. Leaf blades triangular, 2–3-pinnate; ultimate segments ovate to linear, toothed or lobed. Umbels loose compound, terminal and axillary; bracts few or absent; bracteoles 3–5, similar to bracts, 4–10 × 0.3–0.6 mm, very unequal, sometimes reflexed; umbellules 3–8-flowered; pedicels 3–6 mm, stout, very unequal. Calyx teeth 0.5–2 mm, longer than the styles. Petals ca. 1.4 × 1 mm. Fruit 5–7 × 1.6–2.8 mm; primary ribs short subulate, secondary ribs densely stellate subulate. Fl. and fr. Feb–Jun(–Sep).

About two species: native in S and W Europe; cultivated worldwide; one species (introduced) in China.


**欧芹 ou qin**


Plant 30–100 cm. Basal leaves long-petiolate, petioles 3–7 cm, narrowly sheathing at base; blade 5–8 × 4–7 cm; ultimate segments narrowly elliptic or ovate, 4–12 × 1.5–9 mm, 3-parted or deeply toothed, teeth obtuse, white-micronate, adaxially shiny. Leaves reduced upwards, becoming 3-lobed, segments narrower, lanceolate-linear, entire or 3-lobed. Umbels 3–6(–8) cm across; bracts 1–2 or absent, linear, 2–5 mm, apex acute, thinly coriaceous; rays 10–25(–30), 1–2.5(–5) cm, subequal; bracteoles 6–8, linear or subulate, 1.5–2.5 mm, shorter than flowers; umbellules ca. 20-flowered; pedicels 1.5–4.5 mm. Fruit 2–4 × 1.5–3 mm, gray-brown. Fl. and fr. Jun–Jul.

Cultivated in some cities in China [possibly native to the W Mediterranean region].

This species is cultivated in many temperate countries worldwide as a culinary herb (parsley) and is often adventive. It has reputed medicinal value.


Ammios Moench, nom. rej.

Herbs, perennial or annual. Taproot narrow. Stem erect, terete, much-branched, usually puberulous, rarely glabrous. Basal leaves 2–3-pinnate-ternate/pinnatisect; ultimate segments ovate, narrowly lanceolate, 3–5 × 0.5–0.9 mm, almost as long as flowers, rarely longer; umbellules 15–35-flowered; pedicels 4–8 mm. Calyx teeth conspicuous, ovate-triangular. Petals white or greenish-white, obovate or suborbicular, apex narrow, inflexed. Stylopodium depressed; styles slender, reflexed when mature. Fruit ovoid-globose, rounded at both ends or base cordate, flattened laterally, glabrous; ribs 5, thick, corky; vittae 1 in each furrow, 2 on commissure. Seed face plane or slightly concave. Carpophore 2-fid.

About three species: N temperate zone; one species in China.


毒芹 du qin

Plants 70–120 cm. Rootstock 2–4 cm thick, surface tawny, yellow within, exudes yellow sap when cut. Stem solitary, sometimes purplish-tinged. Basal leaves petiolate, petioles 15–30 cm; blade triangular or ovate-triangular, 12–30 × 10–25 cm; pinnae 3-lobed or pinnatifid; ultimate segments linear-lanceolate or lanceolate, 1.5–6 × 0.3–1 cm, serratate to sharply serrate. Upper leaves 1–2-pinnate; ultimate segments narrowly lanceolate or lanceolate, 1.25 × 0.2–0.5 cm. Umbels 5–15 cm across; peduncles 2.5–20 cm; bracts absent or 1, linear, ca. 8 mm; rays 6–25, 2–6 cm, subequal, slender; bracteoles numerous, linear-lanceolate, 3–5 × 0.5–0.9 mm, almost as long as flowers, rarely longer; umbellules 15–35-flowered; pedicels 4–8 mm. Calyx teeth 0.3–0.5 mm, unequal. Petals ca. 1.2 × 1 mm. Fruit 2.3–3.5 × 1.8–3 mm. Fl. and fr. Jul–Sep.

Forest margins, marshy areas, bogs, streamside; often emergent in shallow water; 300–3300 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Sichuan, Xinjiang, Yunnan [Japan, Kashmir, Korea, Mongolia, Russia; Europe].

All parts are highly toxic, especially the rootstock; nevertheless, the plant has reputed medicinal value.

1a. Cicutia virosa var. virosa
du qin (yuan bian zhong)

Cicutia virosa f. longiinvolucellata Y. C. Chu.

Ultimate segments of leaves linear-lanceolate or narrowly lanceolate. Seed face slightly concave.

Forest margins, marshy areas, bogs, streamsides, often emergent in shallow water; 400–3300 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Sichuan, Xinjiang, Yunnan [Japan, Kashmir, Korea, Mongolia, Russia; Europe].


宽叶毒芹 kuan ye du qin

Cicutia nipponica Franchet.

Ultimate segments of leaves long-elliptic or elliptic-ovate, 5–10 × 2–4 cm, base cuneate, irregularly serrulate, apex acuminate. Seed face plane.

Marshy places; 300–500 m. Jilin, Shanxi [Japan, SE Russia].

糙果芹 cao guo qin

Plants perennial, 70–160 cm. Stem hollow, much branched above, scabrous. Basal and lower leaves petiolate, petioles 2–5 cm, slender, scabrous; blade ovate-triangular, 3–10 × 2.5–7 cm, deeply 1–2-pinnatifid; ultimate segments broad-ovate, ovate-lanceolate or nearly ovate-triangular, 1–3.5 × 0.5–2.5 cm, base cuneate, truncate or cordate, irregularly serrate or dentate, striate on both surfaces, apex acuminate. Leaves reduced upwards, ultimate segments becoming narrow. Umbels many, 2.5–4 cm across, lax; peduncles 1–4 cm, slender; bracts and bracteoles absent; rays 3–8, 1–2 cm, very slender, spreading widely; umbellules 3–8-flowered, 3–5 mm across; pedicels very thin, 0.5–2 mm, unequal. Petals white, ca. 0.8 × 0.7 mm. Fruit ovoid-globose, 0.9–1.1 × 1.1–1.3 mm across, base cuneate, surface scabrous with short appressed hairs. Fl. and fr. Jul–Sep.

- Open forests or scrub on mountain slopes, grassy places on mountain slopes or roadsides; 600–3000 m. Guangxi, Guizhou, Sichuan, Yunnan.

1a. Plants sparsely scabrous; ultimate leaf segments irregularly serrate or dentate

1b. Plants densely pubescent throughout; ultimate leaf segments deeply dentate to pinnate

1a. var. scaberulum

糙果芹(原变种) cao guo qin (yuan bian zhong)


Plants sparsely scabrous. Ultimate leaf segments irregularly serrate or dentate.

- Open forests or scrub on mountain slopes, grassy places on roadsides; 600–2600 m. Guangxi, Guizhou, Sichuan, Yunnan.

1b. var. ambrosiifolium

糙果芹(变种) cao guo qin (bian zhong)

Carum ambrosiifolium (Franchet) H. Wolff, Acta Horti Gothob. 2: 305. 1926.

马尔康糙果芹 ma er kang cao guo qin

Plants 60–90 cm, perennial, scabrous or shortly hirtellous throughout. Basal leaves petiolate, petioles 1–2.5 cm, sheaths short; blade 2–2.5 cm, pinnate; pinnae 3–5, ovate or obovate, 5–15 × 2–12 mm, 3-parted or apex 3-lobed, base cuneate, margin entire or sparingly dentate. Leaves reduced upwards, becoming 3-parted, segments linear, entire or 1–2-serrate. Umbels 1.5–2 cm, numerous, leaf-opposed; peduncles 1–5 cm; bracts and bracteoles absent; rays 2–4, 5–13 mm; umbellule 3–7-flowered; pedicels 1–2 mm, very slender, elongating in fruit. Petals obovate, ca. 1 × 1 mm. Fruit broadly ovoid-acuminate, ca. 1.8 × 1.5 mm, densely white striigose. Fl. and fr. Aug–Sep.

- Mountain slopes, roadsides; 2600–3200 m. Sichuan (Drogochi).

This incompletely known taxon is recorded only from a few collections


滇南糙果芹 dian nan cao guo qin

Pimpinella roxburghiana de Candolle, Prodr. 4: 109. 1830; Apium in volucratum Roxburgh; Carum roxburghianum (de Candolle) Kurz, C. stictocarpum C. B. Clarke; Pimpinella involucrata (Roxburgh) Wight & Arnott; Psychotis involucrata (Roxburgh) Lindley; Trachyspermum involucratum (Roxburgh) H. Wolff; T. roxburghianum (de Candolle) H. Wolff; T. stictocarpum (C. B. Clarke) H. Wolff.

Plants annual, 20–100 cm. Leaves petiolate, petioles slender, 1–2 cm; blade ovate in outline, 3–8 × 2–12 cm, 2-pinnate or ternate-pinnate; ultimate segments narrowly oblong, 5–20 × 2–3 mm, base cuneate. Leaves reduced upwards, ultimate segments becoming linear-lanceolate. Umbels 2–4 cm across; peduncles 5–9 cm; bracts and bracteoles few, linear-subulate or ciliate, 3–5 mm; rays 4–12, 1–3 cm, filiform, unequal, hirsutulous or glabrescent; umbellules 12–20-flowered; pedicels 1–5 mm, unequal, hirsutulous. Fruit ovoid, 1.5–3 × 1.5–2 mm, apex contracted forming a very short neck, densely hirsutulous or glabrescent. Fl. and fr. Feb–Jul.

Cultivated, adventive on forest margins and in ruderal areas. S Yunnan (Xishaungbanna) [apparently native to S India].

This species cultivated as a spice throughout the Indian subcontinent, SE Asia, and Indonesia.


細叶糙果芹 xi ye cao guo qin

Sison ammi Linnaeus, Sp. Pl. 1: 252. 1753; Ammi copticum Linnaeus; Bunium copticum (Linnaeus) Sprengel; Carum copticum (Linnaeus) C. B. Clarke; Daucus coptica (Linnaeus) Persoon; Psychotis coptica (Linnaeus) de Candolle; Trachyspermum copticum (Linnaeus) Link.

Plants annual, 20–50(–90) cm, essentially glabrous. Leaves petiolate, petiole 1–5 cm; blade triangular-ovate in outline, 2–8 × 2–6 cm, 2–3-pinnate/pinnatisect; ultimate segments
linear–filiform to 15 × 0.2–0.5 mm. Umbels 2.5–5 cm across; bracts 3–8, linear-subulate, 5–7 mm; rays 6–20, 1–3 cm; bracteoles 5–10, linear, 2–3 mm; umbellules ca. 1 cm across, ca. 20-flowered; pedicels 0.5–4 mm, unequal. Calyx teeth conspicuous, minute, ovate or obsolete. Petals ca. 1.3 × 1.3 mm. Fruit 1.2–2 × 1.2–1.8 mm, densely covered in whitish minute papillae. Fl. & fr. May–Aug.

Cultivated, adventive in dry open ruderal areas. W Xinjiang [apparently native to India].

The fruits are used as a spice for flavoring and for perfume; they have reputed medicinal value (in Xinjiang). The species is extensively cultivated throughout C, S, and SW Asia.


**绒果芹属 rong guo qin shu**

Pu Fading (溥发鼎 Pu Fa-ting); Mark F. Watson, Michael G. Pimenov, Eugene V. Kljuykov

Herbs perennial, usually pubescent throughout. Taproot stout, long-cylindrical, woody. Stem sparingly branched from base, erect or caespitose, blade often woody, densely clothed in fibrous or tough remnant sheaths. Leaves mostly basal, petiolate, petioles slender, base sheathing; blade 1–2-pinnate; ultimate segments entire or pinnatifid. Leaves rapidly reduced upwards, stem upper parts almost leafless. Inflorescence branching, umbels compound, lax, terminal; bracts few, linear, inconspicuous, or absent; rays few, (2–6–8–20)-flowered; petals white, obovate, rarely purple. Petals white, 1–2-pinnate, ultimate segments 2–5; petals pale yellow or purple.

Six to eight species: N Iran, W Himalayan region to N and W China; three species (two endemic) in China.

The generic boundaries between *Eriocycla* and *Seseli* (and the Mediterranean genera *Deverra* de Candolle and *Pituranthos* Viviani) are problematic and need further research. Recent work by Russian authors suggests that *Eriocycla* should be included within *Seseli* (see *Seseli* for comments and a synopsis of an alternative classification).

1a. Leaves basal and cauline, pinnate, ultimate segments coarsely dentate; bracts 1 or absent; petals white ................. 1. *E. albecens*

1b. Leaves mostly basal, caespitose, 1–2-pinnate, ultimate segments crenate; bracts 2–5; petals pale yellow or purple.

2a. Plants 20–40 cm; umbellules 10–20-flowered; petals pale yellow, densely pubescent; seed face plane (Xinjiang) .................................................................................................................................................................. 2. *E. pelliotii*

2b. Plants 35–70 cm (smaller plants with purple petals); umbellules 8–10(–12)-flowered; petals light yellow or purple, slightly pubescent; seed face slightly concave (Xizang) ................................................................. 3. *E. muda*


**绒果芹 rong guo qin**

Plants 20–70 cm, olive-green, pubescent. Basal leaves withered at flowering. Lower stem leaves petiolate, petioles 0.5–1.5 cm, purplish; blade narrowly oblong in outline, 5–12 × 1–5 cm, 1-pinnate; primary pinnae 4–5 pairs; ultimate segments entire or pinnatifid. Leaves rapidly reduced upwards, stem upper parts almost leafless. Inflorescence branching, umbels compound, lax, terminal; bracts few, linear, inconspicuous, or absent; rays few, (2–6–8–20)-flowered; petals white, 1–2-pinnate, ultimate segments 2–5; petals pale yellow or purple. Petals white, 1–2-pinnate, ultimate segments 2–5; petals pale yellow or purple.

1a. Pinnae usually small, 6–15 × 8–12 mm ... 1a. var. *albecens*

1b. Pinnae large, 25–50 × 15–30 mm ............... 1b. var. *latifolia*

1a. **Eriocycla albecens** var. *albecens*

**绒果芹(原变种) rong guo qin (yuan bian zhong)**

*Seseli albecens* (Franchet) Pimenov & Kljuykov; *S. provostii* H. de Boissieu.

Plants gray-green, pubescent. Pinnae 6–15 × 8–12 mm.

- Limestone talus slopes. Hebei, Nei Mongol.


**大叶绒果芹 da ye rong guo qin**

Plants pale greenish, sparingly pubescent. Pinnae large, 25–50 × 15–30 cm.

- Arid limestone slopes; 500–1100 m. Hebei, NW Liaoning.


**新疆绒果芹 xin jiang rong guo qin**


Plants 20–40 cm, sparsely pubescent. Basal leaves caespitose, petiole 1.5–3 cm; leaf blade oblong in outline, 3–6 × 1–2.5 cm, 1–2-pinnate; primary pinnae 4–5 pairs; ultimate segments ovate, margins irregular serrulate. Stem leaves much reduced or

- Arid limestone slopes; 500–1100 m. Hebei, NW Liaoning.

鸭儿芹


**1a. Plant s 35–70(–100) cm; petals pale yellow.**

**1b. Plants ca. 15 cm; petals purple.**

**3a. Eriocycla nuda var. nuda**

裸茎绒果芹（原变种）

Plants 35–70(–100) cm; petals pale yellow. Fl. and fr. Feb–Oct.


紫花裸茎绒果芹

Plants ca. 15 cm. Petals purple.

**42. CRYPTOTAENIA de Candolle, Coll. Mém. 5: 42. 1829, nom. cons.**

鸭儿芹属

Pan Zehui (潘泽惠); Mark F. Watson

Deringa Adanson, nom. rej.


**3a. Cryptotaenia japonica** Hasskarl, Retzia 1: 113. 1855.

鸭儿芹

Herbs, annual or biennial, glabrous. Stem erect, terete, branching. Leaves petiolate, sheath narrow; blade ternate-pinnate or pin-natisect, membranous; ultimate segments filiform to lanceolate. Umbels compound, terminal and lateral; bracts numerous, entire or

**80**

**APIACEAE**
pinnately divided, reflexed in fruit; bracteoles many, entire. Calyx teeth obsolete or inconspicuous, minute. Petals white or yellowish, obcordate or deeply 2-lobed, lobes unequal, base tapering, clawed, apex reflexed, outer petals in outer flowers radiant. Stylododium low-conic, base slightly undulate; styles slender, more than twice as long as stylodium, reflexed. Fruit ovoid or ovoid-oblanceolate, slightly compressed laterally, commissure constricted, mericarps pentagonal in cross section, glabrous; ribs 5, acute; vittae 1 in each furrow, 2 on commissure. Seed face plane. Carpophore entire or 2-cleft to base.

About six species: Mediterranean region; cultivated elsewhere; two species (introduced) in China.

1a. Biennial; ultimate leaf segments 0.5–1 mm; rays in fruiting umbel becoming erect, rigid and tightly constricted on discoid torus ................................................................. 1. *A. visnaga*

1b. Annual; ultimate leaf segments 5–20 mm; rays in fruiting umbel divergent, not so thickened, only slightly constricted, not on a discoid torus .................................................................................. 2. *A. majus*

1. **Ammi visnaga** (Linnaeus) Lamarck, Fl. Franç. 3: 462. 1779.

阿米芹  a mi qin


Plants biennial, ca. 1 m. Basal leaves petiolate, petioles ca. 10 cm; blade pinnate; ultimate segments slender, linear, 20–30 × 0.5–1 mm, entire, divergent, apex setaceous. Upper leaves 2–3-pinnate. Umbels 6–10 cm across; peduncles elongate, 6–20 cm; bracts many, 1–2-pinnate, equaling or longer than rays; rays 60–100(–150), slender, 2–5 cm, unequal, spreading when young, in fruit becoming thick, rigid, erect and constricted on discoid torus (thickened base of rays); bracteoles numerous, subulate, 3–10 mm, entire, equaling flowers; umbellules many-flowered; pedicels 1.5–10 mm, base thickening in fruit into a discoid torus similar to rays. Calyx teeth inconspicuous, minute, ca. 0.2 mm. Petals white. Fruit 2.2–2.5 × 1–1.5 mm. Carpophore entire. Fl. Jun–Jul, fr. Jul–Aug.

Cultivated in some specialist gardens and medicinal farms, adventive in alkaline grasslands and on dry mountain slopes; below 500 m. Provincial distribution unknown [native to the Mediterranean region].


大阿米芹  da a mi qin

Plants annual, 20–100(–150) cm. Basal leaves petiolate, petiole 3–13 cm; blade ternate-3-pinnate; lateral ultimate segments narrowly elliptic, terminal segments obovate-elliptic, 10–15 × 5–20 mm, base cuneate, margin finely setaceous-serrate, apex obtuse or acute, gray-green. Cauline leaves 2-pinnate; ultimate segments ovate or oblong, distally narrowly lanceolate, entire or 3-lobed. Umbels 4–10 cm across; peduncles 8–14 cm; bracts numerous, 3-lobed, pinnate or entire, longer than rays; rays 20–50(–60), 2–8 cm, slender, inner faces hispid, spreading when young, in fruit becoming slightly constricted; bracteoles numerous, linear-acuminate or linear-lanceolate, 2–6 mm, spreading or reflexed; umbellules many-flowered; pedicels 1.5–7 mm, very thin, unequal. Fruit oblong, 1.5–2 × 0.6–1 mm. Carpophore 2-cleft to base. Fl. Jun–Jul, fr. Jul–Aug.

Cultivated in some medicinal farms, adventive in ruderal areas, wasteland, or along roads; below 200 m. Provincial distribution unknown [native to the Mediterranean region].

44. **CARUM** Linnaeus, Sp. Pl. 1: 263. 1753.

葛缕子属  ge lü zi shu

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

Herbs biennial or short lived perennial, glabrous. Taproot tuberous, fusiform, elongate or cylindrical. Stem usually branched above, base with or without papery remnant sheaths. Basal leaves petiolate, narrowly sheathing; blade 2–4-pinnate; ultimate segments linear or lanceolate. Stem leaves gradually reduced upward. Umbels compound, terminal. Calyx teeth obsolete, rarely present, narrowly triangular. Petals broadly obovate, white, rarely pinkish or purplish, midvein yellow or yellow-green, base cuneate, with an inrolled apex. Stylododium conic; styles recurved. Fruit oblong-ellipsoid or oblong-ovoid, slightly laterally compressed, glabrous; ribs 5, filiform, prominent; vittae 1(–3) in each furrow, 2–4 on commissure. Seed face plane. Carpophore 2-parted.

About 20 species: N temperate zone; four species (one endemic) in China.

This widespread genus has very uncertain limits.

1a. Bracteoles as long as or longer than umbellules, margins ciliate; calyx teeth prominent ................................. 4. *C. bretschneideri*

1b. Bracteoles shorter than umbellules or absent, margins entire; calyx teeth obtuse.

2a. Base of stem without remnant sheaths; bracteoles absent ................................................................. 1. *C. carvi*

2b. Base of stem clothed with papery remnant sheaths; bracteoles 5–8.

3a. Basal leaves 3–4-pinnate; petals white; vittae solitary in each furrow .................................................... 2. *C. buriaticum*

3b. Basal leaves 2–3-pinnate; petals purplish-red; vittae 3 in each furrow .................................................... 3. *C. atrosanguineum*

1. **Carum carvi** Linnaeus, Sp. Pl. 1: 263. 1753.

葛缕子  ge lü zi

_Carum gracile_ Lindley; *C. carvi var. gracile* (Lindley) H. Wolff; *C. carvi f. rubriflorum* H. Wolff.

Plants annual, 20–100(–150) cm. Basal leaves petiolate, petiole 3–13 cm; blade ternate-3-pinnate; lateral ultimate segments narrowly elliptic, terminal segments obovate-elliptic, 10–15 × 5–20 mm, base cuneate, margin finely setaceous-serrate, apex obtuse or acute, gray-green. Cauline leaves 2-pinnate; ultimate segments ovate or oblong, distally narrowly lanceolate, entire or 3-lobed. Umbels 4–10 cm across; peduncles 8–14 cm; bracts numerous, 3-lobed, pinnate or entire, longer than rays; rays 20–50(–60), 2–8 cm, slender, inner faces hispid, spreading when young, in fruit becoming slightly constricted; bracteoles numerous, linear-acuminate or linear-lanceolate, 2–6 mm, spreading or reflexed; umbellules many-flowered; pedicels 1.5–7 mm, very thin, unequal. Fruit oblong, 1.5–2 × 0.6–1 mm. Carpophore 2-cleft to base. Fl. Jun–Jul, fr. Jul–Aug.

Cultivated in some medicinal farms, adventive in ruderal areas, wasteland, or along roads; below 200 m. Provincial distribution unknown [native to the Mediterranean region].

This species has reputed medicinal value.

Forests, brushey alpine meadows, riparian grasslands, radialar areas; 1500–4300 m. Gansu, Hebei, Henan, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Sichuan, Xinjiang, Xizang, Yunnan [wide-spread in Asia, Europe, and the Mediterranean region; introduced elsewhere].


田葛缕子  tian ge lü zi

Bunium buriaticum (Turczaninow) Drude; Carum angustissimum Kitagawa; C. buriaticum f. angustissimum (Kitagawa) H. Wolff; C. curvatum C. B. Clarke ex H. Wolff; C. furcatum H. Wolff; C. pseudoburiaticum H. Wolff.

Plants 50–80 cm. Taproots cylindric, to 18 cm. Stem solitary, rarely 2–5; base with papery remnant sheaths. Basal and lower leaves oblong-ovate in outline, 3–4-pinnate; ultimate segments linear, 2–5 × (0.3–)0.5–1 mm. Umbels 4–8 cm across; bracts 2–4, linear or linear-lanceolate, ca. 3 mm; rays 9–15, 1.5–5 cm, slightly unequal; bracteoles 5–8, lanceolate, ca. 1.5 × 0.3 mm; umbellules 10–30-flowered. Calyx teeth obsolete. Petals white, base not clawed. Fruit oblong-ellipsoid, 3–4 × 1.5–2 mm; vittae 1 in each furrow, 2 on commissure. Fl. May–Jul, fr. Aug–Oct. n = 11*.

Forests, alpine meadows, fields, roadsides; 1500–3600 m. Gansu, Hebei, Henan, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Mongolia, Russia].

This species has reputed medicinal value (in Shanxi).


暗红葛缕子  an hong ge lü zi

Vicatia atrosanguinea (Karelin & Kirilov) P. K. Mukherjee & M. Pimenov.

Plants ca. 40 cm. Taproot slender, much-branched. Stem erect, base clothed with papery remnant sheaths. Basal leaves oblong-lanceolate in outline, 2–3-pinnate; ultimate segments lanceolate, 3–5 × 1.5–2 mm. Bracts absent, occasionally 1–2, linear to lanceolate, shorter than rays; rays 5–10, 2–4 cm, very unequal; bracteoles 2–5, linear, equaling pedicels; umbellules 6–10-flowered. Calyx teeth obsolete. Petals purplish-red. Fruit oblong-ovoid, 3–4 × 1.5–2 mm; vittae 3 in each furrow, 4 on commissure. Fl. and fr. May–Sep.

Forests, shady valleys, riparian grasslands; 1800–3600 m. Xinjiang [Kazakhstan, Kyrgyzstan, Russia].

Some authors consider this species to belong in Vicatia, but others disagree on the basis of the fundamental difference of a flat seed face in Carum atrosanguineum compared to a sulcate one in Vicatia. Pending future work we here retain this species in Carum. The NW Himalayan (non-Chinese) Tongoloa wolffiana Fedde ex H. Wolff (V. wolffiana (Fedde ex H. Wolff) C. Norman) is included by some authors in synonymy under V. atrosanguinea; however, further work is needed in order to confirm or reject this placement.


河北葛缕子  he bei ge lü zi

Plants 20–45 cm. Taproot elongate, slender. Stem solitary or 2–3, little-branched, base without remnant sheaths. Basal leaves ovate-lanceolate in outline, 2–3-pinnate; ultimate segments lanceolate, ca. 1 cm, ciliate on the margins; rays 8–12, 1–4 cm, slightly unequal; bracteoles 5–8, similar to bracts, as long as or longer than the umbellules; umbellules 15–25-flowered. Calyx teeth small, narrowly triangular, ca. 0.5 mm. Petals white, base shortly clawed. Fruit oblong-ellipsoid, ca. 4 × 1.8 mm; vittae solitary in each furrow, 2 on commissure. Fl. and fr. Jun–Sep.

- Shady moist places; 1500–2000 m. Hebei, Shanxi.

The following species have been described from Chinese material, but are imperfectly known as no specimens have been seen or the specimens are inadequate.


小芹属  xiao qin shu

Pu Fading (溥发鼎 Pu Fa-tìng); Mark F. Watson, Ingrid Holmes-Smith

Carum Linnaeae sect. Dactylaea Franchet; Dactylaea (Franchet) Farille.

Herbs, perennial, slender, glabrous (except S. filicinum). Rootstock fusiform or elongate, usually slender. Stems erect, solitary or 2–4, caespitose. Basal leaves petiolate; petiole sheath usually broad, ovate or oblong-ovate at base; blade ternate-1–3-pinnate or 1–
3-pinnate. Leaves reduced upwards. Inflorescence branching, umbels compound, terminal; bracts mostly absent, occasionally 1–4, linear or similar to uppermost leaf; rays few, usually 5–15; bracteoles present (rarely absent), usually linear, entire, apex rarely lobed; umbrellas usually many-flowered. Calyx teeth obsolete, or conspicuous, triangular or subulate-lanceolate. Petals white or purple, ovate, obovate-ovoid or obovate, base clawed, apex acute or slightly obtuse, rarely 2–3-lobed or palmately 3–5-lobed. Stylodium flat, rarely low-conic; styles short. Fruit oblong-ovoid, slightly laterally compressed, smooth; ribs 5, filiform; vittae 1–3 in each furrow, 2–6 on commissure. Seed face plane. Carpophore 2-fid or 2-parted.

About 20 species: high-altitude Sino-Himalayan region from Nepal to SW China; eight species (four endemic) in China.

This taxonomically complex genus is closely related to, and sometimes difficult to distinguish from, *Acronema*. *Sinocarum* is usually circumscribed by a suite of characters: rhizome elongate, petiole sheaths expanded, petals obtuse at apex, clawed at base, flowers radiant, and fruit oblong-ovoid. By contrast, *Acronema* is characterized by having tuber globose or oblong, petiole sheaths narrow, petals acute to filiform at apex, cuneate at base, flowers symmetric, and fruit usually ovoid or broadly so, slightly cordate at base. However, within each genus there are species that deviate in one or more of these characters, and the generic boundaries are blurred. Revision of these two genera is hampered by a lack of complete material: specimens are usually collected in flower, and mature fruits are unknown for an alarmingly high proportion of the taxa. Initial results from molecular sequence data on Himalayan species suggest that these two genera should be combined, but further work and more collections are needed to clarify the situation across the whole geographic range.

**Sinocarum pseudocruciatum** H. Wolff (Repert. Spec. Nov. Regni Veg. 27: 182. 1929) was described from Sichuan (“Washan,” A. Henry 7067, holotype, K). However, it is not treated in this account as it is imperfectly known.

Pimenov and Klijuykov (pers. comm.) consider the following imperfectly known taxa to be conspecific and a species of *Sinocarum*: Trachydium souliei H. de Boissieu (Bull. Soc. Bot. France 53: 422. 1906), described from Xizang (J. A. Soulé 1049, holotype, P), and *T. dielsianum* H. Wolff (Acta Horti Gothob. 2: 300. 1926), described from Sichuan (SE of “Matang,” 4800 m, K. A. H. Smith 4375, holotype, unlocalized).

1a. Bracteole apex usually 2–3-lobed or pinnatifid, rarely entire; calyx teeth conspicuous, ca. 0.5 mm, triangular-lanceolate. ................................................................. 8. *S. dolichopodum*

1b. Bracteole apex entire; calyx teeth minute or obsolete.

2a. Petal apex 2–3-lobed or palmately 4–5-lobed (or entire in *S. coloratum*).

3a. Stem purple, at least at base; calyx teeth subulate; petal apex usually entire, occasionally 2–3-lobed 6. *S. coloratum*

3b. Stem green; calyx teeth obsolete; petal apex palmately 4–5-lobed ................................. 7. *S. schizopetalum*

2b. Petals always entire.

4a. Calyx teeth obsolete; bracteoles absent.

5a. Plants 3–5 cm; basal leaves trifoliolate; rays 2–3 ................................................................. 4. *S. pauciradiatum*

5b. Plants 40–70 cm; basal leaves 3-pinnate; rays 10–20 .................................................................. 5. *S. pityophilum*

4b. Calyx teeth minute, subulate; bracteoles present or absent.

6a. Basal leaves 2-pinnate, petioles pubescent, ultimate segments oblong-ovate, abaxially pubescent; bracteoles 5–8 ......................................................................................................................... 3. *S. filicinum*

6b. Basal leaves ternate-1–3-pinnate, petioles glabrous, ultimate segments linear-lanceolate or elongate-linear, glabrous; bracteoles absent.

7a. Basal leaves ternate-1–2-pinnate, ultimate segments linear-lanceolate or elongate-linear, 3–15 × 1–2 mm; rays 4–7(–10); petals violet or greenish-white .................................................. 1. *S. cruciatum*

7b. Basal leaves ternate-2–3-pinnate, ultimate segments elongate-linear, 10–30 × 0.5–2 mm; rays 8–15; petals white ............................................................................................................. 2. *S. vaginatum*


**钝瓣小芹** dun ban xiao qin

Plants 10–30 cm, slender, glaucous throughout. Rootstock short, thick, ca. 2 × 0.5 mm. Stems 1–3 or numerous, 1–2-branched or unbranched. Basal leaves petiolar, petioles 5–7 cm; blade triangular in outline, 4–10 × 4–8 cm, ternate-1–2-pinnate; pinnae 3–5 pairs; ultimate segments linear-lanceolate, 3–15 × 1–2 mm. Cauline leaves elongate-linear, 5–35 × 0.5–1 mm, reduced upwards becoming 1-pinnate or 3-lobed. Umbels 1.5–2 cm across; bracts and bracteoles absent, occasionally 1; rays 4–7(–10), 1–3 cm, subequal; umbrellas ca. 5 mm across, 10–15-flowered; pedicels ca. 2 mm. Calyx teeth minute, triangular, ca. 0.1 mm. Petals violet or greenish-white, entire, apex obtuse to subacute. Young fruit oblong-ovoid (mature fruit unknown); vittae 1 in each furrow, 2 on commissure. Fl. and fr. Jul–Oct.

Forests, open alpine scrub, riparian grasslands; 2800–4200 m. W Sichuan, SE Xizang, NW Yunnan [N Myanmar].

This species and *Sinocarum vaginatum* form a group of narrow-leaved taxa with unclear taxonomic limits: flower color and leaflet dimensions are particularly variable. Further work with new collections will be needed to clarify the situation.

1a. Ultimate segments of basal leaves linear-lanceolate, 3–5 × ca. 1 mm; petal apex obtuse-rounded, not inflexed ........ 1a. var. *cruciatum*

1b. Ultimate segments of basal leaves linear, 5–15 × 1–2 mm; petal apex slightly incurved ......................................... 1b. var. *linearilobum*
1a. Sinocarum cruciatum var. cruciatum  
純瓣小芹（原変種） dün bāo xiǎo qín (yuán biàn zhòng)


Basal leaves 2–3-pinnate; ultimate segments linear lanceolate, 3–5 × ca. 1 mm. Petals violet, apex obtuse-rounded, not inflexed.

- Forests, open alpine scrub, riparian grasslands; 2800–4200 m. W Sichuan, SE Xizang, NW Yunnan.

1b. Sinocarum cruciatum var. linearilobum (Franchet) H. Wolff  
窄瓣小芹 jùn bāo xiǎo qín


Open alpine scrub; 3500–4200 m. W Sichuan, SE Xizang, NW Yunnan [N Myanmar].


阔鞘小芹 kuò qiāo xiǎo qín

_Carum vaginatum_ (H. Wolff) M. Hiroe; _Sinocarum c. var. v._ H. Wolff.

Plants 10–25 cm. Rootstock short, thick, ca. 4.5 × 0.8 cm. Stems 1–2, 1–2-branched or unbranched. Basal petioles 5–18 cm, sheath ovate; blade triangular, 5–13 × 5–8 cm, ternate-2–3-pinnate; pinnae 4–6 pairs; ultimate segments elongate-linear, 10–30 × 0.5–2 mm. Cauline leaves 1–2-pinnate, reduced upwards. Umbels 3–4 cm across, often subtended by uppermost leaf with broad sheath; bracts absent or occasionally 1; rays 8–15, 1–2 cm, unequal; bracteoles absent; umbellules 8–12 mm, 10–20-flowered; pedicels 1–5 mm. Calyx teeth minute triangular, ca. 0.2 mm. Petals white, entire, apex acute, radiate. Young fruit oblong-ovoid (mature fruit unknown); vittae 1 in each furrow, 2 on commissure. Fl. and fr. Jul–Sep.

- Forest margins, brushy alpine meadows; 3200–4300 m. W Sichuan, SE Xizang, NW Yunnan.


少辐小芹 shǎo fú xiǎo qín

_Carum filicinum_ (H. Wolff) M. Hiroe; _Sinocarum c. var. f._ H. Wolff.

Plants 40–70 cm. Rootstock fusiform, 3–5 × ca. 0.5 mm. Stems solitary, 1–2-branched. Basal petioles 1.5–3 cm, sheath broadly ovate; blade triangular in outline, ca. 5 × 5 cm, 3-pinnate; pinnae 6–9 pairs; ultimate segments linear, 2–5 × 0.3–1 mm. Umbels 3.5–6 cm across; bracts absent, occasionally 1, linear, 1–1.5 cm; rays 10–20, 2–4 cm, unequal; bracteoles absent; umbellules 1–1.5 cm across, 12–15-flowered; pedicels 3–5 mm, unequal. Calyx teeth obsolete. Petals purplish-red or white, entire. Fruit ovoid-ellipsoid, ca. 2 × 1.4 mm (mature fruit unknown). Fl. and fr. Jul–Sep.

Brushy alpine meadows, limestone rock crevices; 3200–4500 m. SW Sichuan (Daocheng, Muli, Xiangcheng), SE Xizang (Cona, Mêdog), NW Yunnan (Gongsan) [Bhutan].


松林小芹 sōng lín xiǎo qín


Plants 40–70 cm. Rootstock fusiform, 3–5 × ca. 0.5 mm. Stem solitary, 1–2-branched. Basal petioles 1.5–3 cm, sheath broadly ovate; blade triangular in outline, ca. 5 × 5 cm, 3-pinnate; pinnae 6–9 pairs; ultimate segments linear, 2–5 × 0.3–1 mm. Umbels 3.5–6 cm across; bracts absent, occasionally 1, linear, 1–1.5 cm; rays 10–20, 2–4 cm, unequal; bracteoles absent; umbellules 1–1.5 cm across, 12–15-flowered; pedicels 3–5 mm, unequal. Calyx teeth obsolete. Petals white, entire, apex obtuse, outer petals in umbellule slightly radiate. Fruit unknown. Fl. and fr. Jul–Sep.

- Sunny slopes in _Pinus_ forests; 3000–3300 m. NW Yunnan (Lijiang).


紫茎小芹 zǐ jīng xiǎo qín


Plants 8–25 cm. Taproot elongate, 3–15 × 0.5–1 cm, thick-
ened at apex, branched. Stems 1–4, characteristically purplish, unbranched or 1–2-branched. Basal petioles 2–7 cm, sheaths oblong-ovate, purplish; blade ovate-lanceolate in outline, 2–8 × 1–3 cm, 1–2-pinnate; pinnae 4–5 pairs; ultimate segments linear-lanceolate, 3–10 × 0.5–2 mm. Umbels 2.5–6 cm across; bracts absent, occasionally 1–2, linear, occasionally leaf-like; rays 5–8(–12), 1–3 cm; bracteoles absent, rarely 1, linear, ca. 2 mm; umbellules 8–16 mm, 8–15-flowered; pedicels 3–5 mm, unequal. Young fruit oblong-ovoid, ca. 1.5 × 1 (mature fruit unknown). Fl. and fr. Jul–Oct.

Brushy alpine meadows, limestone rock crevices; 2900–4600 m. W Sichuan, S Xizang, NW Yunnan [NE India].


裂瓣小芹 lie bai xiao qin

Plants 10–30 cm. Rootstock a short, thick rhizome, 3–5 × 0.5–0.8 cm. Stems 1 or 2–4, branching. Basal petioles 5–8 cm, sheaths broadly lanceolate; blade triangular in outline, 1.5–3 × 1.5–3 cm, ternate to 1- or 2-pinnate, basal pinnae petiolulate; ultimate segments oblong-lanceolate, 3–5 × 1–1.5 mm. Umbels 2.5–4 cm across; bracts absent or occasionally 1, linear-lanceolate; rays (3–)5–6(–8), 1–3 cm; bracteoles 3–5, similar to the bract; umbellules 6–10(–15)-flowered; pedicels 2–4 mm, unequal. Calyx teeth obsolete. Petals white or violet, apex palmately 3–4-lobed, lobes lanceolate or oblanceolate. Stylopodium equal. Calyx teeth subulate, 0.2–0.4 mm, unequal. Petals white, apex usually entire, occasionally 2–3-lobed. Young fruit oblong-ovoid, ca. 1.5 × 1 (mature fruit unknown). Fl. and fr. Jul–Sep.

Shady forests, alpine meadows; 2400–4000 m. E and S Xizang, NW Yunnan.

1a. Rootstock fusiform; leaf blade ternate to 1- or 2-pinnate; petals 3–4-lobed, lobes lanceolate or ovate-lanceolate

.......................... 7a. var. schizopetalum

1b. Rootstock tuberous; leaf blade trifoliate; petals 3-lobed, lobes lanceolate .. 7b. var. bijiangense

7a. Sinocarum schizopetalum var. schizopetalum

裂瓣小芹 (原变种) lie bai xiao qin (yuan bian zhong)


Leaf blade trifoliate. Petals palpitate 3-lobed, lobes linear-lanceolate.

● Shady forests; 2400–4000 m. E and S Xizang, NW Yunnan.


碧江小芹 bi jiang xiao qin


Leaf blade trifoliate. Petals palpitate 3-lobed, lobes linear-lanceolate.

● Alpine meadows; ca. 2400 m. NW Yunnan (Bijiang) [NE Myanmar].

This incompletely known taxon is recorded only from a few collections. In the protologue of Dactylaea wolffiana the type specimen was wrongly cited from Xizang (Tibet); in fact it was collected in NE Myanmar (Imaw Bum).


长柄小芹 chang bing xiao qin


Plants 8–15 cm. Rootstock slender, horizontal, 5–20 × 0.2–0.5 cm. Stem solitary, purplish, usually unbranched. Basal petioles 3–6 cm, sheaths ovate, purplish; blade triangular in outline, 3–6 × 2–3 cm, 2–3-pinnate; pinnae 3–5 pairs, basal pinnae petiolate; ultimate segments ovate, 10–15 × 5–8 mm, margins 3-lobed or pinnatifid. Umbels 4–7 cm across, sometimes subtended by a reduced, 3-lobed leaf; bracts absent; rays 4–6, 4–5 cm, stout; bracteoles 2–6, linear-ob lanceolate or obovate in outline, 4–7 mm, apex usually 2–3-lobed, or pinnatifid, rarely entire; umbellules 10–18 mm across, 10–15-flowered; pedicels 4–8 mm. Calyx teeth conspicuous, triangular-lanceolate, ca. 0.5 mm. Petals white or purplish, apex obtuse. Young fruit oblong-ovoid, ca. 2 × 1.5 mm (mature fruit unknown); vittae 3 in each furrow, 6 on commissure. Fl. and fr. Jul–Sep.

● Alpine meadows, rocks; 3000–4000 m. W Sichuan, NW Yunnan.

This species has reputed medicinal value. The long rhizome, leaf morphology, and divided bracteoles are rather uncharacteristic of Sinocarum, and this species may be better placed elsewhere.
ulate, subequal, sometimes obscure. Petals white or purplish, ovate or long-ovoblate, base attenuate and thickening near attachment, apex narrow, inflexed, rarely plane. Stylopodium either conic and long-tapering into elongate erect styles (styles usually twice as long as the stylopodium) or low-conic abruptly tapering into short, deflexed styles (shorter than or equal to the stylopodium). Fruit oblong-ovoid or ovoid, slightly laterally compressed, glabrous; ribs 5, denticulate, finely scabrid or filiform; vittae 1–3 in each furrow, 2–4 on the commissure. Seed face plane. Carpophore 2-parted or bifid.

About 25 species: E Asia, Himalayan region; 23 species (19 endemic) in China.


1a. Basal and cauline leaves homomorphic (or cauline leaves absent); fruit ribs denticulate or finely scabrid.

1b. Basal and cauline leaves heteromorphic, rarely homomorphic (see. P. gracillimum, P. leptophyllum, P. subalpinum, and P. trichomanifolium); fruit ribs filiform.
late, petioles 6–14 cm, densely strigose; blade ovate or oblong-ovate in outline, 5–15 × 3–8 cm, ternate; leaflets 3–(5), remote, broad-ovate, 2–3 × 1–2 cm, lateral leaflets undivided, strigose on the veins and margins. Cauline leaves 1–2. Umbels 2–3.5 cm across; bracts absent; rays 15–32, 1–3.5 cm; bracteoles 2–3, 0.5–1.5 mm; umbellules 2–3(–5)-flowered, pedicels 0.5–2.5 mm. Calyx teeth subulate, 0.3–0.6 mm. Petals purple-white, ca. 0.5–1.5 mm; umbellules 2–3(–5)-flowered, pedicels 0.2–3 mm. Stylopodium conic; styles elongate; stylopodium plus style 1–1.3 mm. Fruit ovoid, ca. 2–3 × 1.5–2 mm; ribs denticulate; vittae 1–3 in each furrow, 4 on commissure. Fl. Apr–Jun, fr. Jul–Aug.

- Forests; 2000–3300 m. Guizhou, NE and W Yunnan.


**五匹青** 無皮青

Plants 20–50 cm. Stems solitary or 2–3. Basal leaves petiolate, petioles 10–20 cm, glabrous or strigose; blade triangular-ovate in outline, 5–12 × 5–11 cm, ternate; leaflets 3, lateral leaflets usually 2–3-lobed; ultimate segments ovate or rhomboidal, 1.6–6 × 0.6–3.8 cm, glabrous or strigose along veins, margins serrate, apex acute. Umbels 1.5–3 cm across (to 7 cm in fruit); bracts absent; rays 15–30, 2–6(–6) cm; bracteoles 1–4, ca. 0.5 mm, subequal; umbellules 2–5-flowered; pedicels 0.3–1.5 mm in flower. Calyx teeth triangular, 0.5–0.7 mm. Petals white, ca. 1.8 × 0.9 mm. Fruit globose-ovoid or oblong-ovoid, 3.5–5 × 2–3 mm; ribs denticulate; vittae 1–3 in each furrow, 2–4 on commissure. Fl. Apr–Jun, fr. Jul–Sep.

- Forests, grassy slopes, shady or grassy streamssides; 1300–3500 m. S Gansu, Guizhou, Hunbei, Shaanxi, Sichuan, Yunnan [NE India, N Myanmar, Nepal].

All three varieties have reputed medicinal value (in Sichuan).

1a. Ultimate leaf segments ovate or rhomboidal; fruit oblong-ovoid ................................. 2a. var. vulgare

1b. Ultimate leaf segments broad-ovate or ovate-lanceolate; fruit globose-ovoid.

2a. Ultimate leaf segments broad-ovate, densely strigose on veins and petioles .......................... 2b. var. strigosum

2b. Ultimate leaf segments ovate-lanceolate, sparsely strigose on veins, petioles glabrous .......................... 2c. var. acuminatum

2a. Pteropetalum vulgare var. vulgare

**五匹青(原变种)** 無皮青 (yuan bian zhong)

_Cryptotaeniopsis vulgaris_ Dunn, Hooker’s Icon. Pl. 28: t. 2737. 1902; _Deringa vulgaris_ (Dunn) Koso-Poljansky; _Pimpinella clarkeana_ Watt ex Banerji; _Pteropetalum vulgare_ (Dunn) Handel-Mazzetti var. _foliisum_ R. H. Shan & F. T. Pu.

Ultimate leaf segments ovate or rhomboidal, apex acute to acuminate. Fruit oblong-ovoid.

- Forests, shady streamssides; 1400–3500 m. S Gansu, Guizhou, Hunbei, Hunan, Shaanxi, Sichuan, Yunnan [NE India, N Myanmar, Nepal].


**毛叶五匹青** 毛皮青 (mao ye wu pi qing)

Ultimate leaf segments broad-ovate, apex acute, veins and petioles densely strigose. Fruit globose-ovoid.

- Forests; 2000–2500 m. W Sichuan.


**尖叶五匹青** jian ye wu pi qing

Ultimate leaf segments ovate-lanceolate, apex acuminate, veins sparsely strigose, petioles glabrous. Fruit globose-ovoid.

- Forests, grassy streamssides; 1300–1600 m. Shaanxi, Sichuan, NW Yunnan.


**囊瓣芹** nang ban qin

_Cryptotaeniopsis davidii_ (Franchet) H. Wolff.

Plants 20–45 cm. Stems 1–3, branching. Basal leaves petiolate, petioles 8–15 cm, sparsely strigose or glabrous; blade ovate in outline, 6–10 × 5–9 cm, 2-ternate; ultimate segments ovate or rhomboidal, 2–7 × 1–3.5 cm, strigose on the veins, margins serrate, apex acute or acuminate. Umbels 2–4 cm across in flower, to 7 cm in fruit; bracts absent; rays (6–)15–20(–25), 1.5–3.5 cm, strigose only in inner surface; bracteoles 2–3, 1.8 mm; umbellules 2–4-flowered; pedicels 0.3–4 mm. Calyx teeth subulate, 0.7–1 mm. Petals white, ca. 1.8 × 0.9 mm. Stylopodium conic; styles elongate; stylopodium plus style 1–1.4 cm. Fruit ovoid, 2–3 × 2–3 mm; ribs denticulate; vittae 1 in each furrow, 2 on commissure. Fl. Apr–Jun, fr. Jul–Sep.

- Forests, scrub, grasslands, streamssides; 1500–3000 m. S Gansu, Guizhou, W Hubei, S Shaanxi, W Sichuan, S and W Yunnan.


**川鄂囊瓣芹** chuan e nang ban qin


Plants rather stout, 30–80 cm tall. Stems 1–2. Basal leaves petiolate, petioles 10–20 cm, glabrous; blade ovate in outline, 3.5–15 × 3–10 cm, 1–2-ternate; ultimate segments oblong-ovate or ovate-lanceolate, 1–11 × 0.5–2.5 cm, margins double serrate, apex caudate. Umbels 1.5–3 cm across in flower, to 7 cm in fruit; bracts absent; rays (7–)15–30(–40), 2–4 cm; bracteoles 2–3, 0.8 mm; umbellules 2–3-flowered; pedicels 0.2–3 mm. Calyx teeth subulate, ca. 0.4 mm. Petals white, ca. 1.5 × 0.6 mm. Stylopodium conic; styles elongate; stylopodium plus style ca. 1.1 mm. Fruit ovoid, ca. 2–3 × 1.5–2 mm; ribs finely scabrid; vittae 1 in each furrow, 2–4 on commissure. Fl. Apr–Jun, fr. Jul–Aug.

- Forests, valley sides, moist rock crevices; 1300–2100 m. W Hunbei, E Sichuan.

散血芹 san xue qin

Plants 15–60 cm. Stems 1–2(–3), branching. Basal leaves petiolate, petioles 10–15 cm, glabrous; blade ovate in outline, 3.5–8 × 3–8 cm, ternate-1-pinnate; ultimate segments ovate or rhomboid, 1–6 × 0.5–1.5 cm, glabrous or sparsely strigose along veins, margin crenate, apex ciliolate. Umbels 1.5–3 cm across in flower, to 7 cm in fruit; bracts absent; rays (6–)15–30(–40), 2–3(–5) cm; bracteoles 2–3, 0.3–1 mm; umbellules (2–)3-flowered; pedicels 0.2–3 mm. Calyx teeth subulate, ca. 0.4 mm. Petals white, ca. 1.5 × 0.6 mm. Stylarodium conic; styles elongate; stylarodium plus styles ca. 1.1 mm. Fruit ovoid or broadly so, 2–3 × 1.5–2 mm; ribs finely scabrid; vittae 1–3 in each furrow, 2–4 on commissure. Fl. Apr–Jun, fr. Jul–Aug.

1a. Ultimate leaf segments 0.5–1.5 cm broad; fruit broadly ovoid .................. 5a. var. botrychioides

1b. Ultimate leaf segments 2–3 cm broad; fruit ovoid .................................. 5b. var. latipinnulatum

5a. Pternopetalum botrychioides var. botrychioides

1a. Ultimate leaf segments 2–5 × 1–3 cm, 2–3 lobed or undivided .......................... 7a. var. molle

1b. Ultimate leaf segments 4–7 × 3–5 cm, margins irregularly lobed to pinnatifid .......... 7b. var. dissectum

5b. Pternopetalum botrychioides var. latipinnulatum


散血芹 san xue qin

Plants 15–60 cm. Stems 1–2(–3), branching. Basal leaves petiolate, petioles 10–15 cm, glabrous; blade ovate in outline, 3.5–8 × 3–8 cm, ternate-1-pinnate; ultimate segments ovate or rhomboid, 1–6 × 0.5–1.5 cm, glabrous or sparsely strigose along veins, margin crenate, apex ciliolate. Umbels 1.5–3 cm across in flower, to 7 cm in fruit; bracts absent; rays (6–)15–30(–40), 2–3(–5) cm; bracteoles 2–3, 0.3–1 mm; umbellules (2–)3-flowered; pedicels 0.2–3 mm. Calyx teeth subulate, ca. 0.4 mm. Petals white, ca. 1.5 × 0.6 mm. Stylarodium conic; styles elongate; stylarodium plus styles ca. 1.1 mm. Fruit ovoid or broadly so, 2–3 × 1.5–2 mm; ribs finely scabrid; vittae 1–3 in each furrow, 2–4 on commissure. Fl. Apr–Jun, fr. Jul–Aug.

1a. Ultimate leaf segments 0.5–1.5 cm broad; fruit broadly ovoid .................. 5a. var. botrychioides

1b. Ultimate leaf segments 2–3 cm broad; fruit ovoid .................................. 5b. var. latipinnulatum

5b. Pternopetalum botrychioides var. latipinnulatum

This poorly known taxon is recorded only from a few collections.


洱源囊瓣芹 er yuan nang ban qin

Plants 10–35 cm. Stems 1–3, glabrescent, slender. Basal leaves petiolate, petioles 5–18 cm, glabrous; blade triangular-ovate in outline, 2–10 × 2–8 cm, 1–2-pinnate; ultimate segments broad-ovate or rhomboidal, 2–5 × 1–3 cm, membranous, glabrous abaxially slightly glaucous, margins serrate or crenate. Cauline leaves 1–2. Inflorescence 1–2-branched; umbels 2–3 cm across in flower, to 6 cm in fruit; bracts absent; rays (5–)10–20, 1–3.5 cm; bracteoles 2, 0.4–0.8 mm; umbellules (1–)2–3-flowered; pedicels 0.3–2.5 mm. Calyx teeth subulate, ca. 0.4 mm. Petals white, ca. 2 × 0.9 mm. Stylarodium conic; styles elongate; stylarodium plus styles ca. 1.3 mm. Fruit ovoid or oblong-ovoid, 2–3 × ca. 1 mm; ribs finely scabrid or minutely denticulate; vittae 1–3 in each furrow, 4 on commissure. Fl. Apr–Jun, fr. Jul–Sep.

1a. Ultimate leaf segments 2–5 × 1–3 cm, 2–3 lobed or undivided .......................... 7a. var. molle

1b. Ultimate leaf segments 4–7 × 3–5 cm, margins irregularly lobed to pinnatifid .......... 7b. var. dissectum


裂叶囊瓣芹 lie ye nang ban qin

Ultimate leaf segments 4–7 × 3–5 cm, margins irregularly lobed to pinnatifid. Rays 1.5–3.5 cm. Fruit oblong-ovoid.


骨缘囊瓣芹 gu yuan nang ban qin

Plants ca. 25 cm. Stems 1–3, slender. Basal leaves petiolate, petioles 3.5–25 cm; blade ovate in outline, 2–10 × 2–8 cm, 1–2-pinnate; ultimate segments broad-ovate, 2–3 × 1–3 cm, somewhat coriaceous, abaxially slightly glaucous, margins serrate, veins and margins cartilaginous and sparsely setose. Cauline leaves usually 1. Inflorescence branching, umbels 1–2 cm across in flower, larger in fruit; bracts absent; rays 10–20; bracteoles 2, ca. 0.4 mm; umbellules 2-flowered; pedicels 0.2–2 mm. Calyx teeth subulate, ca. 1 mm. Petals white. Stylarodium conic; styles elongate; stylarodium plus styles ca. 1 mm. Fruit ovoid, 2.5–3 × ca. 2.5 mm; ribs denticulate; vittae not recorded. Fl. and fr. Mar–Jul.


脊叶囊瓣芹 ji ye nang ban qin

Ultimate leaf segments 4–7 × 3–5 cm, margins irregularly lobed to pinnatifid. Rays 1.5–3.5 cm. Fruit oblong-ovoid.


liğ�囊瓣芹 yi liang nang ban qin

Plant rather stout, 30–60 cm. Stem single, 1–2-branched. Basal leaves petiolate, petioles 4–10 cm, densely strigose; blade broadly triangular-ovate in outline, 4.8 × 4–8 cm, 3–5-foliolate; ultimate segments ovate or oblong-ovate, 3.5 × 2.4 cm, abaxially pale green, strigose on veins, margins crenate. Umbels ca. 2 cm across in flower, to 4 cm in fruit; bracts absent; rays 15–32, 1–3.5 cm; bracteoles 2, ca. 0.5 mm; umbellules 2-flowered,
usually only terminal umbellule fertile; pedicels 0.2–1.5 mm. 
Calyx teeth subulate, ca. 0.4 mm long. Petals white, ca. 1.8 × 0.8 mm. 
Stylopodium conic; styles elongate; stylopodium plus style ca. 1 mm. Fruit ovoid, 2.5–3 × ca. 2.5 mm; ribs denticulate; vittae 1–2 in each furrow, 2–4 on commissure. Fl. Apr–Jun, fr. Jul–Sep.

- Riparian grasslands; 1900–2000 m. C Yunnan.

This poorly known taxon is recorded only from a few collections.


鹧鸪山囊瓣芹 zhe gu shan nang ban qin

Plants 10–30 cm. Stem glabrescent, slender. Basal leaves petiolate, petioles 4–6 cm, glabrous; blade triangular-ovate in outline, 2.5–3 × 2.5 cm, ternate; leaflets 3, ovate, 1.3–0.7–1.5 cm, lateral leaflets 2–3-lobed or undivided, glabrous, margins serrate. Cauline leaves usually 2. Umbels 1.5–2.5 cm across in flower, to 4 cm in fruit; bracts and bracteoles absent; rays (3–)10–20, 1.5–3 cm; umbellules 2–4-flowered; pedicels 0.5–1 mm. Calyx teeth triangular, ca. equaling stylopodium. Petals white. Stylopodium low conic; styles short, less than 0.5 mm. Fruit ovoid, ca. 2.5 × 2 mm; ribs denticulate; vittae 1–3 in each furrow, 2–4 on commissure. Fl. Jun–Jul, fr. Aug–Sep.

- Among mosses in Abies forests; 3400–3900 m. W Sichuan.

This poorly known taxon is recorded only from a few collections.


华囊瓣芹 hua nang ban qin


Plants 30–60 cm. Stem glabrescent, slender. Basal leaves petiolate, petiole 4–6 cm; blade triangular-ovate in outline, 5–7 × 3.5–5.5 cm, 2–3-ternate; ultimate segments ovate, 1.2–1.5 cm, sparsely strigose on the veins, margins crenate. Umbels 3–5 cm across in flower, to 5–7 cm in fruit; bracts 2–3, linear-lanceolate, 1–1.5 cm; rays 7–15, 1–4 cm; bracteoles 2–3, ca. 0.5 mm; umbellules 2–3-flowered; pedicels to 4 mm. Calyx teeth lanceolate, ca. 0.4 mm. Petals white. Stylopodium low conic; styles short, ca. 0.4 mm. Fruit ovate, ca. 3 × 2 mm; ribs finely scabrid; vittae absent in each furrow and on commissure. Fl. and fr. May–Aug.

- Forests; 800–3000 m. Guizhou, Sichuan, NE Yunnan.


裸茎囊瓣芹 lou jing nang ban qin


Plants 10–25 cm. Stems slender, glabrous. Basal leaves 4–6, petiolate, petioles 6–15 cm, glabrous; blade triangular in outline, 3–8(–12) × 2.5–6(–10) cm, ternate; leaflets 3, lateral leaflets ovate, terminal leaflets rhomboidal (1.5–3–6–8.5) × (1–)2–3(–5) cm, 2–3-lobed or entire, glabrous except sparsely set-
Plants 20–65 cm. Stems usually single, or occasionally 2, 1–5-branched or unbranched. Basal leaves absent. Cauline leaves long-petiolate, petioles 1.5–5 cm; blade triangular-ovate, 5–7 × 3–5 cm, ternate-2-pinnate; ultimate segments ovate or ovate-lanceolate, 5–15 × 2–10 mm, setose on the veins. Upper leaves smaller, 2-ternate; ultimate segments ovate-lanceolate, 5–15 × 2–10 mm, setulose on the veins. Up- 


15a. Pternopetalum longicaule var. longicaule

15b. Pternopetalum longicaule var. humile

Plants low, 4–20×30 cm. Leaves occasionally only 1, basal. Rays 4–6. Fruit vitals 1–2 in each furrow, 2 on commissure.

● Forests, alpine meadows; 1900–3700 m. S Gansu, C and S Shaanxi, NW Sichuan.

16. Pternopetalum heterophyllum

Plants 15–30 cm. Stem single, slender, 1–2-branched or unbranched. Basal leaves petiolate, petioles 3–10 cm; blade ovate-triangular, ca. 1.5–4 × 1.5–3.5 cm, ternate; leaflets 3(–5); ultimate segments flabelliform or rhomboidal, ca. 1 × 1 cm, margins serrate. Cauline leaves 1–3, 1–2-ternate; ultimate segments linear, 20–50 × 1–2 mm. Umbels 1.5–2.5 cm across in flower, to 4 cm in fruit; bracts absent; rays 10–20, 1–2 cm; bracteoles 1–3, 0.5–1.8 mm; umbellules 2–3-flowered; pedicels 0.1–1.8 mm. Calyx teeth triangular-subulate, ca. 0.3 mm. Petals white, ca. 1 × 0.7 mm. Stylodium conic; styles elongate; stylodium plus styles ca. 0.6 mm. Fruit ovoid, 1.5–1.7 cm; ribs filiform; vitals 2 in each furrow, 4 on commissure. Fl. Mar.–May, fr. Jun.–Aug.


17. Pternopetalum filicinum

Plants 25–40 cm. Stems 1–2, 1–2-branched or unbranched. Basal leaves petiolate, petioles 3–7 cm; blade triangular-ovate, 2–8 × 2–4 cm, ternate or ternate-2-pinnate; ultimate segments flabelliform or lanceolate, 7–16 × 3–9 mm. Upper leaves 2-ternate; ultimate segments lanceolate-linear, 20–40 × 1–2 mm. Umbels 2–3.5 cm across in flower, to 9 in fruit; bracts absent; rays 7–24, 2–4 cm; bracteoles 2–3, 0.3–1 mm; umbellules 2–3-flowered; pedicels 0.2–1.5 mm. Calyx teeth minute, almost obsolete, triangular, ca. 0.05 mm. Petals white, 0.9–0.5 mm. Stylodium low-conic; styles shorter than stylodium, ca. 0.15 mm, reflexed. Fruit oblong-ovoid, 2.5–3 × 0.7–1 mm; ribs filiform; vitals 2 in each furrow, 4 on commissure. Fl. Apr–Jun, fr. Jul.–Sep.

● Coniferous forests, grassy slopes; 1500–3900 m. S Gansu, W Hubei, Qinghai, Shaanxi, NE and W Sichuan, NW Yunnan.
Specific boundaries with the following species, *Pternopetalum tanakae*, are indistinct and need further work.


**东亚囊瓣芹** dong ya nang ban qin

Plants 1–25 cm. Roots fusiform; rhizomes creeping, frequently with a few tubercles at nodes. Stems 1–2, glabrous, 1–2-branched or unbranched. Basal leaves petiolate, petioles 2–10 cm; blade ovate-triangular, 2.4 × 1.5–3.5 cm, ternate-2-pinnate; ultimate segments lanceolate or lanceolate-linear, 5–15 × 3–8 mm. Cauline leaves 1–2, ternate-1–2-pinnate or ternate; ultimate segments lanceolate or elongate-linear, 10–25 × 2–3 mm. Umbels 2–3 cm across in flower, to 7 cm in fruit; bracts absent (occasionally 1, minute); rays 5–25(–30), 1.5–3 cm; umbellules 1–2(–3)-flowered; pedicels 0.2–2.5 mm. Calyx teeth minute, ca. 0.1 mm, or obsolete. Petals white, oblong, apex acute. Stylodium low-conic; styles ca. 0.2 mm, shorter than stylodium. Fruit oblong ovoid, 1.5–2 × 2–1 mm; ribs filiform; vitae 1–2 in each furrow, 2 on commissure. Fl. and fr. Apr–Aug.

**نباذُنِکانبی** jia bao ye nang ban qin

18a. **Pternopetalum tanakae** var. **tanakae**

**东亚囊瓣芹** dong ya nang ban qin


**假包囊瓣芹** jia bao ye nang ban qin

Leaves 1–2 under the base of umbel, bract-like, 1–2-ternate; ultimate segments elongate-linear, 10–25 × 1–2 mm. Bracts usually absent or occasionally 1, minute, linear-lanceolate. Fruit vitae 1 in each furrow.

- Among mosses in forests; ca. 1500 m. Anhui, Fujian, Jiangxi, Zhejiang.


**丛枝囊瓣芹** cong zhi ye nang ban qin

Plants 20–30(–60) cm. Stems slender, profusely branched, caespitose. Basal leaves petiolate, petioles 1.5–7 cm; blade ovate-triangular in outline, 2.5–6 × 2–5 cm, 1–2-ternate; ultimate segments ovate, ca. 1 × 1 cm, or linear-lanceolate, 2.4 × 0.3–0.5 cm. Cauline leaves ternate; ultimate segments elongate-linear, 30–70 × 3–5 mm. Umbels numerous, 2–3 cm across in flower, to 4 cm in fruit, terminal on stem and branches; bracts absent; rays 5–20, 2–4 cm, pubescent; bracteoles 2–3; umbellules 2–3-flowered. Calyx teeth minute, subulate, ca. 0.3 mm. Petals white. Stylodium low-conic; styles ca. equaling calyx teeth, suberect to slightly reflexed. Fruit ovoid, 2.3–1.5–2 mm; ribs filiform; vitae 1–3 in each furrow, 2 on commissure. Fl. May–Jul, fr. Aug–Oct.

- Forests, forest margins, grasslands; 2300–3600 m. Gansu, Shaanxi, W Sichuan, E Xizang.


**高山囊瓣芹** gao shan nang ban qin

Plants 5–10 cm. Stems 1–2, unbranched, glabrous. Basal leaves petiolate, petioles 2–6 cm; blade ovate-triangular, 8.20 × 9–18 mm, 1-pinnate; pinnae 2–4 pairs, broadly ovate, 2.6–6 mm, margins serrulate. Cauline leaves similar to basal. Umbels 0.5–1.1 cm across in flower, to 3.5 cm in fruit, terminal; bracts absent; rays 5–9, 3–25 mm, extremely unequal; bracteoles 1–2, 0.3–1.5 mm; umbellules (1–)2(–3)-flowered; pedicels 0.2–1.5 mm. Calyx teeth minute, triangular, ca. 0.1 mm. Petals white or purplish-white, ca. 1 × 0.4 mm, apex acute. Stylodium low-conic; styles ca. 0.15 mm, shorter than stylodium, reflexed. Fruit ovoid, 1.5–2 × 0.75–0.9 mm; vitae not observed. Fl. and fr. Jun–Aug.

- Forests, grasslands, stream-sides; 3000–4100 m. NW Yunnan [Bhutan, NE India, Sikkim].


**薄叶囊瓣芹** bao ye nang ban qin

**Cryptotaeniopsis leptophylla** Dunn, J. Linn. Soc., Bot. 35: 495. 1903; **C. viridis** C. Norman; **Pternopetalum confusum** C. Norman; **P. viride** (C. Norman) Handel-Mazzetti.

Plants 10–30 cm. Stems 1–3, usually unbranched or occasionally of a single branch. Basal leaves petiolate, petioles 4–16 cm; blade ovate-acuminate in outline, 3.8 × 1.5–7 cm, 2-pinnate/pinnatifid; ultimate segments ovate-lanceolate, 5.15 × 3–5 mm. Cauline leaves similar to basal. Umbels 2–3 cm across in flower, to 4 cm in fruit; bracts absent; rays 6–25, 1–2 cm; bracteoles 2–4, 1–1.5 mm; umbellules 2–4-flowered; pedicels 0.5–3 mm. Calyx teeth minute, triangular, ca. 0.1 mm. Petals white, apex not inflexed. Stylodium low-conic; styles ca. 0.4 mm, shorter than stylodium, reflexed. Fruit oblong-ovoid, ca. 2 × 1 mm; ribs filiform; vitae 1 in each furrow, 2 on commissure. Fl. and fr. Apr–Aug.

- Shady moist rocks; 1000–1800 m. Sichuan.

This poorly known taxon is recorded only from a few collections. It has reputed medicinal value.

纤细囊瓣芹 xian xi nang ban qin


Plants 10–20 cm tall, glabrous. Stems 1–6, usually unbranched or occasionally of a single branch. Basal leaves petiolate, petioles 5–7 cm; blade ovate-triangular, 1.5–3 × 1–3 cm, ternate-2–3-pinnate; pinnae 4–5-paired, proximal pinnae petiolulate; ultimate segments linear, 1.5–5 × 0.5–1 mm. Cauline leaves absent, or occasionally 1, similar to the basal. Umbels 1–2 cm across in flower, to 5 cm in fruit; usually terminal; bracts absent or 1, linear-lanceolate; rays (5–)10–15–30, 1–3 cm; bracteoles 2–4, 0.7–2 mm; umbellules 2–3-flowered; pedicels 0.2–2 mm. Calyx teeth minute, triangular, ca. 0.1 mm. Petals white, oblong-obovate, base cuneate, apical lobule narrow, inflexed. Stylopodium low-conic; styles elongate; styles longer than the stylopodium. Fruit ovoid-oblong, slightly compressed laterally, glabrous; ribs 5, filiform; vittae 3–4 in each furrow, 8 on commissure. Seed face plane. Carpophore thick, 2-fid.


The following species have been described from Chinese material, but are imperfectly known as no specimens have been seen or the specimens are inadequate.


Plants 30–40(–60) cm. Stems 1–3, usually unbranched or occasionally of a single branch. Leaves almost all basal, petiolate, petioles 3–18 cm; blade triangular-ovate in outline, 6–9 × 5–10 cm, ternate-3–4-pinnate, very finely dissected; ultimate segments linear, 1.5–4 × 1–2 mm. Umbels 1.5–2.5 cm across in flower, to 10 cm in fruit; bracts absent; rays (6–)15–30–(40), (2–)3–5 cm; bracteoles 2–4, 0.7–2 mm; umbellules 2–4-flowered; pedicels 0.1–2 mm. Calyx teeth subulate, ca. 1 mm. Petals white, ca. 2 × 1 mm. Stylopodium conic; styles elongate; stylopodium plus style ca. 1 mm. Fruit oblong-ovoid, 3–4 × 0.8–1.2 mm, often only one mercarp develops in fruit; ribs filiform; vittae 1–3 in each furrow, 4 on commissure. Fl. Mar–May, fr. Jun–Aug.

- Forests, mossy rocks; 1500–3400 m. Gansu, Hubei, Sichuan, NW Yunnan.

This species has reputed medicinal value (in Guangxi).


矮伞芹属 ai san qin shu

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

Herbs, perennial, dwarf. Taproot stout, caudex thick. Stem much reduced, almost absent, base clothed in papery (rarely fibrous) remnant sheaths. Leaves in basal rosette, 1–2-pinnate; ultimate segments ovate to lanceolate, toothed or pinnatifid; petiole sheathing at base. Umbels compound, primary umbel terminal, lax, mostly sessile, lateral umbels smaller, pedunculate; bracts and bracteoles linear-lanceolate, reflexed. Fruit oblong-ovoid, ca. 2 × 1.1 mm, both mericarps developed in fruit; ribs filiform; vittae 1–3 in each furrow, to 5 cm in fruit; bracts absent; ray segments linear, 1.5–4 × 1–2 mm. Umbels 1.5–2.5 cm across in flower, to 10 cm in fruit; bracts absent; rays (6–)15–30–(40), (2–)3–5 cm; bracteoles 2–4, 0.7–2 mm; umbellules 2–4-flowered; pedicels 0.1–2 mm. Calyx teeth subulate, ca. 1 mm. Petals white, ca. 2 × 1 mm. Stylopodium conic; styles elongate; stylopodium plus style ca. 1 mm. Fruit oblong-ovoid, 3–4 × 0.8–1.2 mm, often only one mercarp develops in fruit; ribs filiform; vittae 3–4 in each furrow, 8 on commissure. Seed face plane. Carpophore thick, 2-fid.

One species: C and SW Asia.


单羽矮伞芹 dan yu ai san qin

Plants 3–10 cm. Basal leaves 1-pinnate; pinnae 3 pairs, 4–5 × 3–4 mm, margins 5–6-toothed or entire, apex 3-lobed. Terminal umbels 3–20 cm across; bracts 4–6, 6–10 mm; rays 10–12, 4–15 cm; bracteoles 7–9, ca. 4 mm, equaling umbellules; umbellules ca. 1 cm across, 10–15-flowered; pedicels 1.5–3 mm. Fruit 3–4 × 1.5–2 mm. Fl. Jun–Jul, fr. Jul–Aug.

- Grasslands; 2500–2700 m. SW Xinjiang (Kashi).

See also the morphologically similar *Trachydium subnudum*, which differs in having more dissected leaves and many-flowered umbellules. *Chamaesciadum acaule var. acaule* occurs in Afghanistan and SW Asia (SW Caucasus, N Iran, and Turkey) and differs in having 3-lobed or pinnatifid bracteoles. It has been reported from China (Xizang) but no specimens have been seen.

Pimpinella subsect. Spuriopimpinella H. de Boissieu; Spuriopimpinella (H. de Boissieu) Kitagawa.

Herbs, perennial, rarely biennial or annual. Root fibrous or a taproot. Stems erect, branching, base without fibrous remnant sheaths. Basal leaves petiolate, sheathing at base; blade 1–3–terinate, 1–4-pinnate or ternate-1–3-pinnate, sometimes simple. Cauline leaves often heteromorphic. Inflorescence branching, umbels terminal and lateral; bracts and bracteoles present or absent, usually linear, apex entire; rays few to numerous. Calyx teeth usually obsolete, sometimes conspicuous, lanceolate, minute. Petals white, rarely purple, glabrous or hairy abaxially. Stylodium conic or low-conic, rarely depressed; styles short or long, spreading or reflexed (best observed in young or mature fruit). Fruit cordate-ovoid or oblong-ovoid, slightly laterally compressed, constricted at the commissure, glabrous or variously hairy; ribs 5, filiform, sometimes obscured by the indumentum; vittae 1–3(–4) in each furrow, 2–4(–8) on commisure. Seed face plane, rarely slightly concave. Carpophore 2-fid or 2-parted.

About 150 species: disjunct between Africa, Asia, and Europe; 44 species (28 endemic, one introduced) in China.

This large, widespread, and taxonomically complex genus is generally characterized by the small, rather featureless fruits. In China, Pimpinella can be divided into two groups: those species with hairy, puberulent, or distinctly roughened fruits and obsolete calyx teeth; and those with smooth, glabrous fruits and obsolete or conspicuous calyx teeth. Plants falling within the former group should be also be compared with Trachystemum. Several groups of allied species can be recognized within Chinese Pimpinella where species boundaries are indistinct; the P. candolleana complex is a typical example. As these groups are often widespread across Asia, full resolution of the nomenclatural and taxonomic problems can only be achieved with a broad revision across many countries.

1a. Calyx teeth obsolete; fruit usually ornamented, hairy, papillose or granular, occasionally smooth.

2a. Annuals or biennials; bracteoles absent, rarely 1–4.

3a. Stylodium conic; fruit oblong-ovoid .......................................................... 1. P. anisum

3b. Stylodium low-conic; fruit ovoid-globose or cordate-ovoid.

4a. Rays 15–20, 15–40 mm; bracteoles absent (Xinjiang) ................................. 2. P. tuberula

4b. Rays 3–5, 5–10 mm; bracteoles 2–4 (Sichuan, Yunnan) .............................. 3. P. silvatica

2b. Perennials; bracteoles present.

5a. Basal and cauline leaves heteromorphic, ternate or 1-pinnate, pinnae 2 pairs; flowers fertile in terminal umbels, mainly sterile in lateral umbels ................................................................. 4. P. kingdon-wardii

5b. Basal and cauline leaves homomorphic, ternate or 1–2-pinnate; flowers fertile in terminal and lateral umbels.

6a. Root fibrous.

7a. Petals dark purple, glabrous, base shortly clawed ..................................... 5. P. atropurpurea

7b. Petals white, hairy abaxially, base cuneate .............................................. 6. P. diversifolia

6b. Taproot cylindrical or fusiform.

8a. Basal and lower leaves 1–2-pinnate or ternate-1–2-pinnate, rarely ternate.

9a. Rays and pedicels extremely unequal, rays 2–70 mm .................................. 14. P. smithii

9b. Rays and pedicels subequal or slightly unequal, rays 5–25(–30) mm.

10a. Styles 2–4 × stylodium; fruit sparsely pubescent to glabrous; basal leaves 1–2-pinnate ............... 15. P. fargesii

10b. Styles 1–1.5 × stylodium; fruit densely or sparsely pubescent; basal leaves 1-pinnate, or ternate, 1–2-pinnate.

11a. Rays 4–10, slightly unequal; fruit densely pubescent, basal leaves 1-pinnate, rarely ternate ........................................................... 16. P. chungdienensis

11b. Rays 8–16, subequal; fruit sparsely pubescent, basal leaves ternate-1–2-pinnate ....................... 17. P. tonkinensis

8b. Basal and lower leaves simple, 1-pinnate or ternate.

12a. Basal and lower leaves ternate, rarely simple.

13a. Bracteoles equal to or longer than pedicels; vittae 1 in each furrow .................. 12. P. tibetanica

13b. Bracteoles equal to or shorter than pedicels; vittae 1–4 in each furrow ................ 13. P. bisinuata

12b. Basal and lower leaves usually simple.

14a. Leaf blade reniform-rotund, cordate-lanceolate or long triangular, rarely cordate-ovate.

15a. Styles 1–1.5 × stylodium; basal and lower leaves cordate-lanceolate or long triangular (Sichuan, Yunnan) ........................................ 10. P. yunnanensis

15b. Styles ca. 3 × stylodium; basal and lower leaves reniform-rotund (Hubei) ...................... 11. P. renifolia

14b. Leaf blade cordate-ovate.

16a. Rays 6–15, 1–3 cm; bracteoles equal to or longer than flowers, densely hirsute .............. 7. P. rockii

16b. Rays (6–)10–25, 1.5–4(–6) cm; bracteoles shorter than or longer than flowers, glabrous.
1b. Calyx teeth conspicuous or obsolete; fruit glabrous.

18b. Calyx teeth obsolete, rarely minute.

18a. Calyx teeth conspicuous.

28b. Basal and lower leaves 1–2-ternate, ternate-2–3-pinnate or 1–3-pinnate; umbels 2–10 cm across, terminal

28a. All leaves simple or ternate; umbels 0.5–1 cm across, mostly lateral ............................................................. 18.

23a. Petals purple, base shortly clawed.

23b. Petals white, base cuneate; seed face plane.

20b. Fruit ovoid or cordate-ovoid; ultimate leaf segments ovate-lanceolate, ovate, broad-ovate or suborbicular.

20a. Fruit oblong-ovoid; ultimate leaf segments broad-ovate or suborbicular, 1–2 × 1–1.5 cm; styles ca. 1 × stylopodium;

21a. Ultimate leaf segments broad-ovate or suborbicular, 1–2 × 1–1.5 cm; styles ca. 1 × stylopodium; vittae 1 in each furrow ............................................................. 42. P. xizangensis

21b. Ultimate leaf segments ovate-lanceolate or rhombic, 2–8 × 1–4 cm; styles 2–3 × stylopodium; vittae 3 in each furrow.

22a. Rays 2–7 cm; fruit ca. 4 × 3 mm; leaflets acuminate or caudate at the apex ......................................................... 43. P. arguta

22b. Rays 2–3.5 cm; fruit ca. 2 × 1.5–2 mm; leaflets acuminate at the apex ............................................................. 44. P. komarovii

19b. Basal and lower leaves 1–2-ternate or 1–2-pinnate; rays glabrous or pubescent.

23a. Petals purple, base shortly clawed.

24b. Plants 10–30 cm; seed face flat (Xizang) ............................................................................... 36. P. pimpinellisimulacrum

24a. Plants 30–80 cm; seed face slightly concave (Yunnan) .................................................................................... 35. P. purpurea

23b. Petals white, base cuneate; seed face plane.

25a. Root fusiform; petals without incurved apex (Yunnan) .................................................................................... 37. P. liana

25b. Roots fibrous; petals with an incurved apex (NE China).

26a. Leaves ternate, leaflets ovate or broad-ovate ............................................................. 38. P. brachycarpa

26b. Leaves 1–2-ternate, leaflets ovate, oblong-ovate, or rhombic.

27a. Bracts absent, occasionally 2–3; fruit cordate-ovoid, ca. 1 × 0.8 mm ............................................................. 39. P. koreana

27b. Bracts persistent, 3–5; fruit oblong-ovoid, ca. 5 × 2 mm ............................................................. 40. P. calycina

18b. Calyx teeth obsolete, rarely minute.

28a. All leaves simple or ternate; umbels 0.5–1 cm across, mostly lateral ............................................................. 18. P. rubescens

28b. Basal and lower leaves 1–2-ternate, ternate-2–3-pinnate or 1–3-pinnate; umbels 2–10 cm across, terminal and lateral.

29a. Basal and lower leaves 1–2-ternate or 1–2-pinnate.

30a. Rays 2–6; umbellules 2–8-flowered; basal leaves 1–2-ternate or 1-pinnate, pinnae 2 pairs.

31a. Bracteoles 2–3; pedicels 10–15 mm in fruit (Anhui) .................................................................................... 19. P. serra

31b. Bracteoles 0; pedicels 1–10 mm in fruit (Guizhou, Sichuan, Xizang, Yunnan).

32a. Plants glabrous; umbels 3–5 cm across, very lax; fruit ca. 2 mm, usually only one mericarp matures

32b. Plants sparsely puberulent or pubescent; umbels 1–3.5 cm across, compact or open; fruit ca. 1 mm, both mericarps mature.

33a. Plants little-branched above; rays 2–6; style ca. 1 × stylopodium ............................................................. 21. P. flaccida

33b. Plants several- or much-branched above; rays 4–5; style ca. 2 × stylopodium ............................................................. 22. P. grisea


34a. Bracts and bracteoles present; fruit cordate-ovoid; basal leaves 1-pinnate (Taiwan) ........................... 23. P. nitakayamensis

34b. Bracts and bracteoles absent; fruit oblong-ovoid; basal leaves 1–3-pinnate-pinnatifid.

34a. Bracts and bracteoles present; fruit cordate-ovoid; basal leaves 1-pinnate (Taiwan) ........................... 23. P. nitakayamensis

34b. Bracts and bracteoles absent; fruit oblong-ovoid; basal leaves 1–3-pinnate-pinnatifid.

35a. Basal leaves 1-pinnate, pinnae incised or lacerate-pinnatifid, ultimate segments ovate-lanceolate or ovate ............................................................. 24. P. thellungianna

35b. Basal leaves 2–3-pinnate, ultimate segments linear or lanceolate.

36a. Styles ca. 3 × stylopodium; seed face plane; basal leaves 2-pinnate (NE China) ............................................................. 25. P. cnidioïdes

36b. Styles ca. 1 × stylopodium; seed face slightly concave; basal leaves 2–3-pinnate (Xizang) ............................................................. 26. P. filipedinicellata

29b. Basal and lower leaves 1–3-pinnate or ternate-2–3-pinnate.

37a. Root fibrous; basal and lower leaves ternate-2–3-pinnate; styles ca. 2 × stylopodium; seed face plane;

37b. Taproot cylindrical or fusiform; basal and lower leaves 2-ternate or ternate-1–3-pinnate.

38a. Styles ca. equal to stylopodium.

39a. Rays 4–6(–8), extremely unequal; pedicels 2–3 mm in fruit ............................................................. 28. P. brachystyla

39b. Rays 4–10(–13), subequal; pedicels 10–20 mm in fruit ............................................................. 29. P. acuminata

38b. Styles 2–3 × stylopodium.

40a. Rays 5–8, 1.5–2.5 cm; basal leaves ternate-2–3-pinnate ............................................................. 30. P. nyingchiensis

40b. Rays (5–)10–25, 3–6(–8) cm; basal leaves 2–3-ternate.

41a. Petals obcordate, apex incurved; basal leaves 2-ternate

41b. Petals oblong-ovate, apex not incurved; basal leaves 2–3-ternate.

42a. Rays 5–7, 4–5 cm; basal leaves 3-ternate ............................................................. 32. P. triternata

42b. Rays 10–25, 0.5–4(–6.5) cm; basal leaves 2-ternate.

**Anisum vulgare** Gaertner; *Apium anisum* (Linnaeus) Crantz; *Carum anisum* (Linnaeus) Baillon; *Selinum anisum* (Linnaeus) E. H. L. Krause; *Sison anisum* (Linnaeus) Sprengel; *Tragium anisum* (Linnaeus) Link.

Plants annual, 10–50 cm, sparsely shortly pubescent throughout, strongly aromatic. Taproot slender. Stem much-branched. Leaves heteromorphic. Basal leaves simple; petioles 2–5 cm; blade reniform or broad-ovate, 1–3 × 1.2–2.8 cm, puberulent along veins, margin serrate. Cauline leaves 1–2-pinnate; ultimate segments ovate or ovate-lanceolate, 6–17 × 2–7 mm, 3-lobed margin serrate or lacerate. Leaves reduced upwards, becoming 3-lobed; lobes lanceolate or linear-lanceolate. Umbels 1.5–6 cm across; bracts 1(or 2) or absent, linear-lanceolate, 1–2 mm; rays 7–15, 1–4 cm, unequal; bracteoles 1(or 2) or absent, linear, 2–3 mm; umbellules 5–10 mm across, 10–late, 1–2 mm; rays 7–15, 1–4 cm, unequal; bracteoles 1(or 2) or absent, linear, 2–3 mm; umbellules 5–13 mm across, 10–25-flowered; pedicels 0.5–2 mm, unequal. Calyx teeth obsolete. Petals white, oblong-ovate or oblong-rhombic, pilose abaxially, apex with incurved lobule. Stylopodium short-conic; styles 1–1.5 × stylopodium, spreading. Fruit ovoid-globose, 1–1.5 × 0.9–1.2 mm, densely hairy; vittae 3 in each furrow, 4–8 on commissure. Seed face plane. Fl. Jun–Jul, fr. Aug–Sep. 2

- Moist valleys, grassy river banks; 2500–3400 m. W Sichuan, NW Yunnan.

This poorly known taxon is recorded only from a few collections.


**Pimpinella asianensis** M. Hiroe; *P. englerianna* Fedde ex H. Wolff (1930), not H. Wolff (1927); *P. feddeli* W. C. Wu & C. Y. Wu, nom. illeg. superfl.; *P. thyrsiflora* H. Wolff; *P. weishanensis* R. H. Shan & F. T. Pu.

Plants perennial, 30–100 cm, pubescent throughout. Roots fibrous or fascicled. Stem solitary, branching above. Basal petioles 3–10(–20) cm including sheaths; blade ternate or 1-pinnate; leaflets 3–5, ovate or broad-ovate, 3–9 × 2–6 cm, rarely undivided, cordate, pubescent on both surfaces, especially along veins. Cauline leaves homomorphic with the basal, ternate; leaflets oblong-ovate or lanceolate, 10–20 × 5–10 mm. Umbels 2.5–11 cm across; bracts usually absent, sometimes 1–5, linear, often similar to reduced uppermost leaves; rays 9–25, 1–4 cm, unequal; bracteoles 1–4, linear, 2–4 mm, unequal, ca. equal to or shorter than pedicels; umbellules 5–13 mm across, 10–25-flowered, only the terminal umbels or only outer umbellules in lateral umbels with fertile flowers, lateral umbels with sterile flowers; pedicels 1–4 mm, unequal, extending to 11 mm in fruit. Calyx teeth obsolete. Petals white, tinged purple or dark purple, apex slightly notched, with incurved lobule. Stylopodium low-conic; styles ca. 2 × stylopodium, spreading. Fruit ovoid, ca. 1 × 0.8 mm, base cordate, surface shortly papillose-pubescent; vittae 3 in each furrow, 6 on commissure. Seed face plane. Fl. and fr. Jun–Sep.

- Forests, forest margins, among shrubs, grassy slopes, alpine meadows, streamsides; 1700–4000 m. W Sichuan, S Xinjiang, NW Yunnan.


**Pimpinella silvatica** Handel-Mazzetti, Symb. Sin. 7: 714. 1933.

**Pimpinella hui qin**

Plants annual, 50–70 cm, slender, pubescent. Taproot slender. Stem solitary, little-branched. Basal and lower petioles 5–7 cm; blade 1–2-ternate; ultimate segments oblong-ovate, 1.5–4 × 1–2 cm, abaxially pubescent, adaxially pubescent along veins. Upper leaves smaller, 3-lobed, lobes lanceolate, 10–20 × ca. 5 mm. Umbels ca. 2 cm across; bracts 0, occasionally 1, linear; rays 3–5, 0.5–1 cm, unequal; bracteoles 2–4, linear, ca. 3 mm, longer than pedicels; umbellules ca. 6 mm across, 5–8-flowered; pedicels ca. 1 mm. Calyx teeth obsolete. Petals white, broad-ovate, apex slightly notched, with incurved lobule. Stylopodium low-conic; styles ca. 2 × stylopodium. Immature fruit ovoid, base cordate, surface pubescent (mature fruit unknown). Fl. and fr. Jul–Sep.

- Moist valleys, grassy river banks; 2500–3400 m. W Sichuan, NW Yunnan.

This poorly known taxon is recorded only from a few collections.
Plants perennial, 30–40 cm, yellowish pubescent throughout. Root fibrous. Stems 1–2, striate, 3–4-branched. Basal petioles 5–15 cm; blade simple, ovate-cordate, 2.5–4.5 × 2–4 cm, margins crenate. Upper leaves heteromorphic, smaller, sessile, nearly l-3-pinnate or 3-lobed, lobes lanceolate. Umbels 2.5–5 cm across; bracts 1–3, linear or linear-lanceolate, 0.8–1.5 cm, apex entire or 3-lobed; rays 8–12, 2–3 cm, densely yellowish pubescent; bracteoles 4–5, linear, 4–8 mm, ca. equal to or longer than flowers; umbellules 6–10 mm across, 10–15-flowered; pedicels 3–5 mm. Calyx teeth obsolete. Petals dark purple, abaxially pubescent on both surfaces. Young fruit ovoid, base cordate, surface sparsely puberulent (mature fruit unknown). Fl. and fr. Jul–Sep.

- Grassly slopes, alpine meadows; 2900–3500 m. W Yunnan.

This poorly known taxon is recorded only from a few collections. It has reputed medicinal value.

6. Pimpinella diversifolia de Candolle, Prodr. 4: 122. 1830.

异叶茴芹 yi ye hui qin

Plants perennial, 30–200 cm, pubescent throughout. Roots fibrous. Stem solitary, branched. Basal petioles 2–13 cm; blade ternate, leaflets ovate-cordate, 1.5–6 × 1–5 cm, margins coarsely serrate, rarely simple or 1-pinnate. Cauline leaves reduced upwards, 1-pinnate or 3-lobed, lobes narrow, lanceolate, often lacerate. Umbels 3–7 cm across; bracts 1, lanceolate, or absent; rays 6–15(–30), 1–4 cm; bracteoles 1–8, linear, 1–2 mm, shorter than pedicels; umbellules 3–6 mm across, 6–20-flowered; pedicels 1–3 mm, unequal. Calyx teeth obsolete. Petals white, obovate, hairy axially, base cuneate, apex with incurved lobule. Stylepodium conic; styles ca. 2–3 × stylepodium. Fruit ovoid, 1.3–1.6 × 1.3–1.6 mm, base cordate, surface shortly papillose-pubescent; vittae 2–3 in each furrow, 4–6 on commissure. Seed face plane. Fl. May–Sep, fr. Aug–Nov.

Forests, forest margins, montane thickets, montane scrub and grasslands, grassy slopes, streamsides; 200–3300 m. Fujian, Gansu, Guangdong, Guangxi, Hainan, Henan, Hubei, Hunan, Qinghai, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Yunnan, Zhejiang [Afghanistan, Cambodia, India, Japan, Kashmir, Nepal, Pakistan, Vietnam].

This widespread and very variable species has reputed medicinal value in C China.

1a. Plants stoloniferous. 6a. var. diversifolia
1b. Plants without stolons.

2a. Petals obovate, apex notched with incurved lobule. 6a. var. diversifolia
2b. Petals ovate-lanceolate, apex mucronate, slightly incurved. 6b. var. angustipetala

6a. Pimpinella diversifolia var. diversifolia

异叶茴芹(原变种) yi ye hui qin (yuan bian zhong)

Plants without stolons. Petals obovate, apex notched with small incurved lobule.

Forests, forest margins, montane scrub and grasslands, streamsides; 200–3300 m. Fujian, Gansu, Guangdong, Guangxi, Hainan, Henan, Hubei, Hunan, Qinghai, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Yunnan, Zhejiang [Afghanistan, Cambodia, India, Japan, Kashmir, Nepal, Pakistan, Vietnam].


尖瓣异叶茴芹 jian ban yi ye hui qin

Plants without stolons. Petals ovate-lanceolate, apex mucronate, slightly incurved, but not notched and without incurred lobule.

- Forests, grassy slopes. SC Sichuan (Emei Shan).


走茎异叶茴芹 zou jing yi ye hui qin

Pimpinella diversifolia var. stolonifera Goel & U. C. Bhattacharyya.

Plants with stolons. Petals obovate, with an incurred lobe.

Montane forests and thickets; 1800–3300 m. W Sichuan, NW Yunnan [Bhutan, Nepal, Sikkim].


丽江茴芹 li jiang hui qin

Pimpinella wolffiana Fedde ex H. Wolff.

Perennial, 10–40 cm, pubescent throughout. Root fusi-form, slender, 3–20 × 0.3–0.5 cm. Stems 1–8, slender, 1–3-branched. Basal and lower petioles 2–10 cm; blade simple, cor-date-ovate or rounded, 1.5–10 × 1–9 cm, margin serrate-crenate, hirsute pubescent on both surfaces. Upper leaves hetero-morphic, smaller, sessile, sheaths oblong-ovate; blade 1–2-pinnate or 3-lobed; lobes lanceolate. Umbels 2.5–7 cm across; bracts 1–2, lanceolate, 1.5–3 cm, apex entire or 2–3-lobed, like uppermost leaf; rays 6–15, 1–3 cm, densely hirsute; bracteoles 1–4, linear-lanceolate, 5–9 mm, ca. equal to or longer than flowers, hirsute; umbellules 7–11 mm across, 10–15-flowered; pedicels 1.5–4 mm. Calyx teeth obsolete. Petals white or pur-plish, base shortly clawed, apex notched with incurved lobule. Stylepodium conic; styles 1–1.5 × stylepodium, spreading. Fruit ovoid, ca. 1.5 × 1 mm, base cordate, surface puberulent with short dense papillae; vittae 1 in each furrow, 2 on commissure. Seed face plane. Fl. Jul–Aug, fr. Aug–Sep.

- Forest margins, alpine meadows, rock crevices; 2800–4500 m. NW Yunnan.

See the taxonomic note under Pimpinella candolleana.


革叶茴芹 ge ye hui qin

Helosciadium pubescens de Candolle; Pimpinella diversi-folia var. divisa C. B. Clarke; P. diversifolia var. simplicifolia Kuntze; P. sinica Hance; Platyraphe japonica Miquel.
Plants perennial, 30–70 cm, sparsely pubescent. Root fusiform, ca. 5 × 0.4 cm. Stems solitary, rarely 2–3. Basal and lower leaves simple, cordate-ovate, (1–)2–5 × 1–3 cm, both surfaces pubescent, margins coarsely serrate. Upper leaves smaller, sessile, 1-pinnate or 3-lobed, lobes lanceolate. Umbels 2–5 cm across; bracts 1–2, linear, 4–8 mm, or absent; rays (8–)15–20, 2–(4–6) cm, unequal, pubescent; bracteoles 1–3, linear, 1.5–3 mm, shorter than pedicels, glabrous; umbellules ca. 8 mm across, 15–25-flowered; pedicels 0.7–3 mm, unequal. Calyx teeth obsolete. Petals white, obcordate, base cuneate, apex notched with incurved lobe, abaxially hairy. Sympodium conic; styles 1–1.5 × stylopodium, spreading. Fruit ovoid, ca. 1.5 × 1 mm, base cordate, surface densely papillose-rugose; vittae 1–3 in each furrow, 2–4 on commissure. Seed face plane. Fl. May–Aug, fr. Aug–Nov.

This species has been reported medicinally. See the taxonomic note under *Pimpinella candolleana*.


杏叶茴芹 *xing ye hui qin*

*Carum candolleanum* (Wight & Arnott) Franchet.

Plants perennial, 10–100 cm, pubescent throughout. Root cylindrical or fusiform, 5–15 × 0.5–1 cm. Stems 1–2, little-branched. Basal petioles 2–20 cm; blade simple (rarely ternate), cordate-ovate, (1–)3–8 × (1–)2–7 cm, margins coarsely serrate. Cauline leaves few, ternate, 3-lobed or 1-pinnate, rarely entire. Umbels 3–6 cm across; bracts absent or 1–7, linear, 3–8 mm; rays (6–)10–25, 1.5–4 cm, unequal, pubescent or scabrous; bracteoles 1–6, linear, 2.5–4 cm, ca. equal to or longer than pedicels, glabrous; umbellules 9–12 mm across, 10–20-flowered, usually central flowers subsessile and sterile; pedicels 0.5–3.5 mm. Calyx teeth obsolete. Petals white or purplish, obcordate, apex with incurved lobe. Sympodium conic; styles ca. 2–3 × stylopodium. Fruit cordate-ovoid, ca. 1.5–2 × 1–1.5 mm, surface granulate with dense, short papillae; vittae 2–3 in each furrow, 2–4 on commissure. Seed face plane. Fl. Apr–Aug, fr. Aug–Oct.

This species has been reported medicinally. See the taxonomic note under *Pimpinella candolleana*.


云南茴芹 *yun nan hui qin*


Plants perennial, 30–60 cm, sparsely hirsute, especially above. Root cylindrical, 10–15 cm. Stems solitary, rarely 2–3, slender, 2–3-branched. Basal petioles 2–10 cm; blade simple, cordate-lanceolate or narrowly triangular, rarely cordate-ovate, 1.5–7 × 1–5 cm, base faintly cordate or truncate, margins serrate, apex acute. Cauline leaves few, usually 1-pinnate or 3-lobed, lobes lanceolate. Umbels 3–7 cm across; bracts 1–4, linear, or absent; rays 8–20, 2–5 cm, unequal, pubescent; bracteoles 1–10, 1–4 cm, ca. equal to or shorter than pedicels; umbellules 7–12 mm across, 10–15-flowered; pedicels 1–5 mm, very unequal. Calyx teeth obsolete. Petals white, obovate or obcordate, apex with incurved lobe. Sympodium conic; styles 1–1.5 × stylopodium, reflexed. Fruit ovoid, ca. 2 × 1.7 mm, base cordate, surface sparsely pubescent with short papillae; vittae 1–3 in each furrow, 2–4 on commissure. Seed face plane. Fl. May–Jul, fr. Aug–Oct.

This species has been reported medicinally. See the taxonomic note under *Pimpinella candolleana*.


肾叶茴芹 *shen ye hui qin*

Plants perennial, 30–75 cm, glabrous. Root fusiform. Stem solitary, 2–3-branched. Basal leaves simple; blade reniform-rounded, broad-ovate, 5–8 × 4–6 cm, base cordate or truncate, margins coarsely serrate, apex obtuse or 3-lobed. Cauline leaves ternate, leaflets ovate or broad-ovate. Upper leaves smaller, sessile, 3-lobed, lobes lanceolate. Umbels ca. 5 cm across; bracts absent; rays 8–12, 1.5–2 cm, unequal, pubescent; bracteoles numerous, linear, nearly as long as pedicels; umbellules ca. 8 mm across, 10–20-flowered. Calyx teeth obsolete. Petals white, obovate, base cuneate, apex notched with incurved lobe. Sympodium short conic; styles ca. 3 × stylopodium, reflexed. Fruit ovoid-ellipsoid, base cordate, surface minute granulate. Fl. Jun–Jul, fr. Aug–Sep.

This incompletely known taxon is recorded only from a few collections (possibly only the type). See the taxonomic note under *Pimpinella candolleana*.


藏茴芹 *zang hui qin*

Plants perennial, 20–100 cm, sparsely hirsute. Root fusiform or cylindric, 3–10 × 0.3–0.8 cm. Stems 1–3, 1–2(–5)–branched. Basal leaves few, petioles 5–15 cm; blade ternate (rarely simple); leaflets cordate-ovate, 1.5–5 × 1–3.5 cm. Cauline leaves similar to basal, 3-lobed, lobes ovate or lanceolate.
Umbels 3–5 cm across; bracts 1–5, linear, 6–16 mm, or absent; rays 8–15(–20), 1–3(–4) cm, unequal; bracteoles 3–7, linear, 2–4 mm, ca. equal to or longer than pedicels; umbellules 6–8 mm across, 10–20-flowered; pedicels 0.5–2.5 mm. Calyx teeth obsolete. Petals white, obcordate, abaxially hairy, apex notched with small incurved lobule. Stylodium conic; styles 1.5–2 × stylodium, reflexed. Fruit ovoid-globose, 1.8–2 × 1.5–2 mm, sparsely pubescent or glabrescent; vittae 2–4 in each furrow, 4–6 on commissure. Seed face plane. Fl. Jul–Aug, fr. Aug–Oct.

- Forest margins, alpine low scrub, grasslands, streambeds; 1400–3600 m. Gansu, Guangxi, Henan, Hubei, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Yunnan.


1926.


Plants perennial, 30–70 cm, sparsely hirsute. Root fusi- form, 3–5 × ca. 0.3 cm. Stem solitary, slender, 3–4-branched. Basal petioles 3–5 cm; blade ternate, rarely simple; leaflets 1–3 × 1–1.5 cm; lateral leaflets cordate-ovate, base truncate or bisinuate; terminal leaflets ovate-lanceolate. Cauline leaves simple, cordate-ovate, 2.5–4 × 1.5–2 cm, sessile, 3–4-lobed, lobes lanceolate. Umbels 2.5–6 cm across; bracts usually absent, or 1–3, linear, 2–6 mm; rays 8–15, 1.2–5 mm, unequal, densely hirsute; bracteoles 3–5, linear, 1.5–2.5 mm, ca. equal to or shorter than pedicels; umbellules ca. 8 mm across, 10–20-flowered; pedicels 1–3 mm, unequal. Calyx teeth obsolete. Petals white, obovate, apex notched with incurved lobule. Stylodium conic; styles 1–1.5 × stylodium, reflexed. Fruit ovoid, ca. 2 × 1.8 mm, base cordate, surface pubescent with short papillae; vittae 1–4 in each furrow, 2–4 on commissure. Seed face plane. Fl. Jul–Aug, fr. Sep–Oct.

- Forests, grassy slopes, streambeds; 1000–3500 m. W Hubei, Jiangxi, Sichuan.

See the taxonomic note under *Pimpinella candolleana*.


Plants perennial, 30–70 cm, generally pubescent. Root- stock short, thick, ca. 3 × 1.5 cm; roots fusiform. Stem solitary, stout, 3–4-branched. Basal petioles 10–15 cm; blade 1–2-pin- nate; pinnae 2–3 pairs; ultimate segments ovate or ovate-lan- ceolate, 3–4 × 1.5–3 cm, margins serrate. Cauline leaves similar to the basal, smaller, sessile, 3-lobed, lobes lanceolate. Terminal umbels 3–8 cm across, lateral umbels smaller; bracts 0, occasionally 1, linear, like uppermost leaf; rays (7–)15–25, (1–)2–3.5 cm, ca. equal; bracteoles 1–5, linear, 2.5–4 mm, reflexed, nearly as long as pedicels; umbellules ca. 13 mm across, 10–20-flowered; pedicels 3–9 mm. Calyx teeth obsolete. Petals white, obovate or ovate, apex notched with incurved lobule. Stylodium conic; styles ca. 2–4 × stylodium, reflexed or spreading. Fruit ovoid, ca. 3 × 1.8 mm, base cordate, surface sparsely pubescent or glabrous; vittae 2–3 in each furrow, 4 on commissure. Seed face plane. Fl. Jul–Aug, fr. Aug–Oct.

- Forest margins, grasslands, streamsides; 500–3400 m. W Hubei, Jiangxi, Sichuan.


Plants perennial, 30–70 cm, sparsely pubescent. Taproot cylindrical, ca. 5 × 0.8 cm. Stems 1(–2), slender, 2–3-branched or unbranched. Basal petioles 4–6 cm; blade ternate or 1-pin- nate; pinnae 2–3 pairs; ultimate segments ovate or ovate-lan- ceolate, 1–3 × 1–2.5 cm, pubescent, margins coarsely serrate. Cauline leaves similar to the basal, smaller, 1-pinnate or 3-lobed, lobes lanceolate. Umbels 2.5–3 cm across; bracts absent, occasionally 1, linear, like uppermost leaf; rays 4–10, 5–25 mm, slightly unequal, pubescent; bracteoles 1–3, linear, ca. 3 mm, shorter than pedicels; umbellules ca. 7 mm across, 6–10-flowered; pedicels 2–4 mm. Calyx teeth obsolete. Petals white, obovate, base cuneate, apex with incurved lobule. Stylodium low-conic; styles 1–1.5 × stylodium, spreading. Fruit ovoid-globose, ca. 1 × 1 mm, densely pubescent; vittae 3 in each furrow, 4 on commissure. Seed face plane. Fl. Jul–Sep, fr. Aug–Sep.

- Coniferous forests, among shrubs along streamsides, grasslands, rock crevices; 2400–3500 m. W Sichuan, E Xizang, NW Yunnan.


Plants perennial, 50–100 cm, puberulent. Root fusiform. Stem solitary. Basal and lower petioles 5–8 cm; blade ternate or
ternate-1–2-pinnate; ultimate segments broad-ovate, 4–6 × 1–2 cm, base cuneate or truncate, margins irregular serrate. Upper leaves smaller, 3-lobed, lobes lanceolate. Umbels 2–4.5 cm across; bracts 0 or 1–2, linear, ca. 7 mm; rays 8–16, 2–2.5 cm, subequal, pubescent; bracteoles 2–5, linear, shorter than pedicels; umbellules 5–9 mm across, 15–20-flowered; pedicels 1–4 mm. Calyx teeth obsolete. Petals white, obovate, apex with incurved lobule. Stylopodium low-conic; styles 1–1.5 × stylopodium, spreading or reflexed. Fruit ovoid-globose, ca. 1.5 × 2 mm, sparsely pubescent; vittae 3 in each furrow, 4 on commissure. Seed face plane. Fl. Jul–Aug, fr. Sep–Oct.

Montane forests; 1500–2200 m. Hong Kong (Lo Fall Shan), SE Yunnan (Wenshan) [Vietnam].


少花茴芹 shao hua hui qin


Plants annual, 10–40 cm, slender, pubescent. Root fusiform, 5–10 × ca. 2 mm, slender. Stem flexuose, little-branched, ascending (or creeping), densely pubescent along one side, 3–5-branched from the base. Basal and lower petioles 2–5 cm; blade simple or ternate, cordate-rounded; ultimate segments broad-ovate or ovate, 5–20 × 5–20 mm, both surfaces densely pubescent, margins crenate. Upper leaves smaller, sessile, 3-lobed, lobes ovate or lanceolate. Umbels 0.5–1 cm across, usually lateral on short peduncles; peduncles 0.2–1.5 mm; bracts and bracteoles absent; rays 2–3, 0.5–8 mm, very unequal, umbellules 2–3.5 mm across, 2(–4)-flowered; pedicels 0.2–1.5 mm, extremely unequal. Calyx teeth obsolete. Petals pale pink or purple, obovate or broad-ovate, apex with incurved lobule. Stylopodium low-conic or flat; styles ca. 1 × stylopodium. Fruit ovular, ca. 1.8 × 1.3 mm, base cordate, surface glabrous; vittae 3 in each furrow, 4 on commissure. Seed face plane. Fl. May–Jul, fr. Aug.

- Shaded areas among shrubs; ca. 2000 m. SW Guizhou (Xingyi), NW Yunnan (Dêqên, Weixi).

This poorly known taxon is recorded only from a few collections. The illustration in FRPS (55(2): 87. 1985) does not agree with the type of this species (Forest 14885) and is something different.


细软茴芹 xi ruan hui qin

Carum flaccidum (C. B. Clarke) Franchet; Pimpinella duclousii H. de Boissieu.

Plants annual, 30–45 cm, glabrous. Taproot slender. Stem solitary, much-branched, slender. Lower petioles 1–2 cm; blade 1–2-pinnate, pinnae 3–4 pairs; ultimate segments ovate-lanceolate, 10–35 × 5–20 mm. Upper leaves 3-lobed, lobes lanceolate. Umbels numerous, 3–5 cm across, very lax; bracts 1 or absent, linear, ca. 3 mm; rays 2–3, 0.4–1.8 cm, unequal, slender, divergent; bracteoles absent; umbellules ca. 5 mm across, 3–4-flowered; pedicels 1–3 mm, to 8 mm in fruit. Calyx teeth obsolete. Petals white, obovate, apex with small incurved lobule. Stylopodium low-conic; styles ca. equal to stylopodium, spreading. Fruit ovoid, ca. 2 × 1.5 mm, base cordate, surface glabrous, usually only one mericarp mature; vittae 3 in each furrow, 4 on commissure. Seed face plane. Fl. and fr. Jun–Aug.

Plants annual, 40–70 cm, slender, glabrous. Roots fusiform, sometimes clustered. Stem erect, much branched above, rooting at the basal nodes. Basal and lower petioles 4–9 cm; blade ternate or 1-pinnate, pinnae 2 pairs; leaflets oblong-ovate or ovate, 5–7 × 2–4 cm, margins serrate, teeth cartilaginous, lateral leaflets sessile, terminal leaflets petiolate. Upper leaves usually reduced, 3-lobed, lobes oblong-ovate or lanceolate, 5–20 × 3–8 mm. Inflorescence much-branched, umbels 2.5–4 cm across; bracts absent, occasionally 1, lanceolate, 2–5 mm; rays 3–4, 1–3 cm, subequal; bracteoles 2–3, lanceolate, 0.5–2 mm, spreading; umbellules ca. 10 mm across, 3–5-flowered; pedicels 2–6 mm, elongating to 15 mm in fruit. Calyx teeth obsolete. Petals white, ovate, apex with an incurved lobule. Stylopodium low-conic; styles 0.75–1 × stylopodium, spreading. Fruit ovoid, ca. 3 × 1.8 mm, base cordate, surface glabrous; vittae 3 in each furrow, 4–6 on commissure. Seed face plane. Fl. and fr. Jul–Sep.

Streamsides; 800–900 m. Anhui [Japan].

Recent molecular studies uphold Kitagawa's placement of this species in *Sium*.


下曲茴芹 xia qu hui qin

Plants annual, 30–45 cm, glabrous. Taproot slender. Stem solitary, much-branched, slender. Lower petioles 1–2 cm; blade 1–2-pinnate, pinnae 3–4 pairs; ultimate segments ovate-lanceolate, 10–35 × 5–20 mm. Upper leaves 3-lobed, lobes lanceolate. Umbels numerous, 3–5 cm across, very lax; bracts 1 or absent, linear, ca. 3 mm; rays 2–3, 0.4–1.8 cm, unequal, slender, divergent; bracteoles absent; umbellules ca. 5 mm across, 3–4-flowered; pedicels 1–3 mm, to 8 mm in fruit. Calyx teeth obsolete. Petals white, obovate, apex with small incurved lobule. Stylopodium low-conic; styles ca. equal to stylopodium, spreading. Fruit ovoid, ca. 2 × 1.5 mm, base cordate, surface glabrous, usually only one mericarp mature; vittae 3 in each furrow, 4 on commissure. Seed face plane. Fl. and fr. Jun–Aug.

Plants annual, 10–40 cm, slender, pubescent. Root fusiform, 5–10 × ca. 2 mm, slender. Stem flexuose, little-branched, ascending (or creeping), densely pubescent along one side, 3–5-branched from the base. Basal and lower petioles 2–5 cm; blade simple or ternate, cordate-rounded; ultimate segments broad-ovate or ovate, 5–20 × 5–20 mm, both surfaces densely pubescent, margins crenate. Upper leaves smaller, sessile, 3-lobed, lobes ovate or lanceolate. Umbels 0.5–1 cm across, usually lateral on short peduncles; peduncles 0.2–1.5 mm; bracts and bracteoles absent; rays 2–3, 0.5–8 mm, very unequal, umbellules 2–3.5 mm across, 2(–4)-flowered; pedicels 0.2–1.5 mm, extremely unequal. Calyx teeth obsolete. Petals pale pink or purple, obovate or broad-ovate, apex with incurved lobule. Stylopodium low-conic or flat; styles ca. 1 × stylopodium. Fruit ovoid, ca. 1.8 × 1.3 mm, base cordate, surface glabrous; vittae 3 in each furrow, 4 on commissure. Seed face plane. Fl. May–Jul, fr. Aug.

- Shaded areas among shrubs; ca. 2000 m. SW Guizhou (Xingyi), NW Yunnan (Dêqên, Weixi).

This poorly known taxon is recorded only from a few collections. The illustration in FRPS (55(2): 87. 1985) does not agree with the type of this species (Forest 14885) and is something different.


锯边茴芹 ju bian hui qin

Sium serrum (Franchet et Savatier) Kitagawa.

Plants annual, 40–70 cm, slender, glabrous. Roots fusiform, sometimes clustered. Stem erect, much branched above, rooting at the basal nodes. Basal and lower petioles 4–9 cm; blade ternate or 1-pinnate, pinnae 2 pairs; leaflets oblong-ovate or ovate, 5–7 × 2–4 cm, margins serrate, teeth cartilaginous, lateral leaflets sessile, terminal leaflets petiolate. Upper leaves usually reduced, 3-lobed, lobes oblong-ovate or lanceolate, 5–20 × 3–8 mm. Inflorescence much-branched, umbels 2.5–4 cm across; bracts absent, occasionally 1, lanceolate, 2–5 mm; rays 3–4, 1–3 cm, subequal; bracteoles 2–3, lanceolate, 0.5–2 mm, spreading; umbellules ca. 10 mm across, 3–5-flowered; pedicels 2–6 mm, elongating to 15 mm in fruit. Calyx teeth obsolete. Petals white, ovate, apex with an incurved lobule. Stylopodium low-conic; styles 0.75–1 × stylopodium, spreading. Fruit ovoid, ca. 3 × 1.8 mm, base cordate, surface glabrous; vittae 3 in each furrow, 4–6 on commissure. Seed face plane. Fl. and fr. Jul–Sep.

Forests, among shrubs, grassy slopes, alpine meadows; 2200–3800 m. W Sichuan, NW Yunnan [NE India].

Specimens attributed to this taxon have been confused with *Trachypermum scaberulum*. Further work is needed to clarify the status of this Indian species in China.

灰叶茴芹 hui ye hui qin

Plants biennial, 60–80 cm, slender, pubescent throughout. Taproot slender, short, ca. 5 cm. Stems several, much-branched. Lower petioles 3–7 cm; blade ternate; leaflets ovate, 10–30 × 3–5 mm, margins serrate. Upper leaves smaller, 1-pinnate, pinnae 2–3 pairs, or 3-lobed; lobes lanceolate or linear. Umbels numerous, 1–2 cm across; bracts and bracteoles absent; rays 4–5, 5–10 mm, unequal; umbellules ca. 5 mm across, 5–10-flowered; pedicels 1.5–2.5 mm, Calyx teeth obsolete. Petals white, ovate or obovate, apex with incurved lobule. Stylodium conic; styles ca. 2 × stylodium, spreading. Fruit oblong-ovoid, ca. 3 × 2 mm, glabrous; vittae 3 in each furrow, 4–6 on commissure. Seed face plane. Fl. Jun–Aug, fr. Aug–Oct.

Forests, among shrubs, grassy slopes; 600–2300 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi, Shandong, Shansi [SE Russia].

This species has reputed medicinal value (in Shanxi).


蛇床茴芹 she chuang hui qin

Pimpinella thellungiana H. Wolff var. tenuisecta Y. C. Chu.

Plants perennial, 20–40 cm, sparsely pubescent. Root cylindrical, 7–10 × ca. 1 cm. Stem little-branched. Basal and lower petioles 5–20 cm; blade 2-pinnate; primary pinnae 5–6 pairs; secondary pinnae broad linear, 5–15 × 1–2 mm, sparsely pubescent. Upper leaves reduced, 1-pinnate or 3-lobed, lobes linear. Umbels 3–5 cm across; bracts and bracteoles absent; rays 15–25, 2–4 cm; umbellules 5–10 mm across, 15–20-flowered; pedicels 2–4 mm. Calyx teeth obsolete. Petals white, obovate, base shortly clawed, apex with small incurved lobule. Stylodium conic; styles ca. 3 × stylodium. Fruit oblong-ovoid, ca. 3 × 2.5 mm, base cordate, glabrous; vittae 3 in each furrow, 4 on commissure. Seed face plane. Fl. Jun–Jul, fr. Aug–Sep.

Grassy slopes. Hebei, Heilongjiang, Jilin.


台湾茴芹 tai wan hui qin

Pimpinella astilbifolia Hayata.

Plants perennial, 10–40 cm, pubescent to nearly glabrous. Root cylindric, ca. 10 × 0.3 cm. Stems little-branched or unbranched. Basal petioles 5–10 cm; blade oblong-ovate in outline, 4–8(–20) × 1.5–3 cm, 1-pinnate; pinnae 2–4 pairs, remote, sessile, broad-ovate or suborbicular, rarely 2–3-lobed, 10–20 × 5–15 mm, base truncate, margins dentate, apex obtuse or round-ed. Cauline leaves less, 1–2-pinnate, pinnae lanceolate, deeply lacerate. Umbels terminal, (2–)5–7 cm across, occasionally lateral; bracts 1–3, linear-lanceolate, 5–8 mm; rays 6–8(–12), 2–3(–4) cm, hirsute; bracteoles 1–5, linear, 2–4 mm; umbellules 5–11 mm across, 6–8-flowered; pedicels 0.5–4 mm, very unequal. Calyx teeth obsolete. Petals white or cream, apex with small incurved lobule. Stylodium short conic; styles ca. equal to stylodium. Fruit ovoid, 2–3 × 1.5–2 mm, base cordate, surface glabrous; vittae 2–3 in each furrow, 4–6 on commissure. Seed face plane. Fl. May–Sep, fr. Aug–Oct. 2n = 18*, 20*.

Grassy slopes in valleys; 1200–4000 m. SE Xizang, NW Yunnan (Dêqên).

This poorly known taxon is recorded only from a few collections.


Plants perennial, 50–70 cm, glabrous. Stem cylindric, 7–10 × ca. 1 cm . Stem little-branched. Lower petioles 9–11 cm; blade 2-pinnate; primary pinnae 5–6 pairs; secondary pinnae broad linear, 5–15 × 1–2 mm, sparsely pubescent. Upper leaves reduced, 1-pinnate or 3-lobed, lobes linear. Umbels 3–5 cm across; bracts and bracteoles absent; rays 15–25, 2–4 cm; umbellules 5–10 mm across, 15–20-flowered; pedicels 2–4 mm. Calyx teeth obsolete. Petals white, obovate, base shortly clawed, apex with small incurved lobule. Stylodium conic; styles ca. 3 × stylodium. Fruit oblong-ovoid, ca. 3 × 2.5 mm, base cordate, glabrous; vittae 3 in each furrow, 4 on commissure. Seed face plane. Fl. Jun–Aug, fr. Aug–Sep.

Grassy slopes. Hebei, Heilongjiang, Jilin.


细柄茴芹 xi bing hui qin

Plants perennial, ca. 40 cm, glabrous throughout. Roots unknown. Stem little-branched. Lower petioles 9–11 cm; blade broad-ovate or triangular-ovate in outline, 7.5–10 × 3.5–5 cm, 2–3-pinnate; primary pinnae 4–5 pairs; ultimate segments lanceolate. Upper leaves reduced, smaller. Umbels 10–14 cm across; bracts and bracteoles absent; rays 6–8, 3.5–5 cm; umbellules 15–20 mm across, 9–14-flowered; pedicels 5–10 mm, filiform. Calyx teeth obsolete. Petals white, broad obovate, base narrow, apex with small incurved lobule. Stylodium domed; styles ca. 1 × stylodium, spreading. Fruit oblong-ovoid, 5–7 × 2.5–3 mm, glabrous; vittae 3 in each furrow, 4 on commissure. Seed face slightly concave. Fl. and fr. Aug–Sep.

Montane rock crevices. E Xizang (Lhorong).

This poorly known taxon is recorded only from a few collections.


沼生茴芹 zhao sheng hui qin

Plants perennial, 50–70 cm, glabrous. Root fibrous. Stem branched. Lower petioles 7–10 cm; blade ternate-2–3-pinnate; ultimate segments ovate-lanceolate or lanceolate, 10–20 × 5–10

羊红膻 yang hong shan
mm, pubescent on the veins. Upper leaves smaller. Umbels 3–4.5 cm across; bracts absent; rays 20–30, 5–30 mm, extremely unequal; bracteoles 3–5, linear, 1.5–3 mm, ca. equal to or shorter than pedicels; umbellules 4–6 mm across, 10–20-flowered; pedicels 2–3 mm. Calyx teeth obsolete. Petals white, obovate, base cuneate, apex with incurved lobule. Syllodipodium conic; styles ca. 2 × stylodipodium. Fruit ovoid, 2.5–3 × ca. 2 mm, base cordate, surface glabrous; vittae 3 in each furrow, 4 on commissure. Seed face plane. Fl. Jun–Jul, fr. Aug–Sep.

- Montane forests, grassy slopes; 1300–1600 m. W Hubei, NE Sichuan.


Plants perennial, 60–100 cm, glabrous. Root cylindrical, 10–15 × ca. 0.4 cm. Stem little-branched. Basal and lower petioles 3–8 × 0.3–0.6 cm. Stem 2–3-branched. Basal petioles ca. 7 cm, purplish at base; blade broad-ovate in outline, 8–10 × 12–14 cm, ternate-2–3-pinnate; ultimate segments ovate or broad-ovate, 1.2–1.5 × 1–1.2 cm, abaxially papillose-scaly along the main veins and rachis. Cauline leaves similar to basal, smaller, sessile, 1–2-pinnate or 3-lobed. Umbels 2.5–4 cm across; bracts 1, reduced to sheath with aristate tip, ca. 5 mm; rays 5–8, 1.5–2.5 cm, subequal, scabrid; bracteoles 3–6, linear, ca. 2 mm, umbellules ca. 15 mm across, 12–14-flowered; pedicels 1–4 mm, unequal. Calyx teeth obsolete. Petals white, obovate, unequal, base shortly clawed, apex with incurved lobule. Syllodipodium flattened; styles 2–3 × stylodipodium. Fruit ovoid, ca. 2 × 1.8 mm, base cordate, surface glabrous; vittae 2–3 in each furrow, 4 on commissure. Seed face plane. Fl. and fr. Jul–Sep.

- Moist valley sides, grassy slopes, stream sides; 500–2000 m. Gansu, Hebei, NE Mongol, Shanxi.


尖叶茴芹 jian ye hui qin


Plants perennial, 60–100 cm, glabrous. Root cylindrical, 3–8 × ca. 0.8 cm. Stem little-branched, often tinged purple at base. Lower petioles 6–14 cm; blade ternate-2-pinnate; ultimate segments ovate or lanceolate, 10–20 × 5–10 mm, abaxially pubescent along veins, margins irregularly incised. Upper leaves smaller, 1–2-pinnate or 3-lobed, lobes lanceolate. Umbels 4–10(–14) cm across; bracts 5–6, linear, 3–20 mm; rays 4–10(–13), 2–3 cm in flower, subequal, lengthening to 5–6 cm and spreading in fruit; bracteoles 2–6, linear-filiform, 2–13 mm; umbellules 9–15 mm across, 5–12-flowered; pedicels 0.5–6 mm, very unequal, lengthening to 10–20 mm in fruit. Calyx teeth obsolete. Petals white, broad-ovate, abaxially pilose, apex notched with incurved lobule. Syllodipodium conic; styles ca. equal to stylodipodium. Fruit ovoid, 2–3 × ca. 2 mm, base cordate, surface glabrous; vittae 2–3 in each furrow, 2 on commissure. Seed face slightly concave. Fl. Jun–Jul, fr. Aug–Sep.

- Mossy forests, open forests, among shrubs, alpine meadows; 3000–3600 m. W Sichuan, E Xizang, NW Yunnan.


三出叶茴芹 san chu ye hui qin

Plants perennial, 30–150 cm, glabrous. Root fusiform. Basal petioles 3–8 cm; blade triangular-ovate in outline, 10–20 × 10–25 cm, 3-ternate; leaflets oblong-lanceolate or oblong-rombic, 1–3 × 1–2 cm, margins serrate or pinnatifid. Cauline leaves similar to basal, 3-lobed, lobes linear-lanceolate, or reduced to bladeless sheaths. Umbels 3–7 cm across, terminal umbels with hermaphrodite and sterile flowers, flowers in lateral umbels all sterile; bracts absent; rays 5–7, 4–5 cm, shortly pubescent; brac-
teoles few, linear, 2–14 mm; umbellules ca. 6 mm across in flower, to 16 mm across in fruit, many-flowered; pedicels 2.5–3 mm, about equal, those of the fertile flowers elongating to 7 mm in fruit. Calyx teeth obsolete. Petals white, ovate or oblong-ovate, apex mucronate, without incurred lobe. Stylodium conic; styles 2–4 × stylodium. Fruit ovoid, 1.5–2.8 × 0.5–1.8 mm, base cordate, surface glabrous; vittae 3–4 in each furrow, 2–4 on commissure. Seed face slightly concave. Fl. and fr. Jul–Sep.

- Forest margins, grasslands; 800–1700 m. Chongqing (Chengkou, Nanchuan).

This poorly known taxon is recorded only from a few collections.


**Pimpinella sutchuenensis** H. de Boissieu.

Plants perennial, 50–100 cm, stout, essentially glabrous. Root cylindrical, ca. 8 × 0.7 cm. Stem 3–5-branched. Basal petioles 18–25 cm; blade 2-ternate; leaflets oblong-ovate or oblong-rhombic, 4–12 × 2–10 cm, margins coarsely serrate or irregularly incised. Cauline leaves similar to basal, 1-pinnate or 3-lobed. Umbels 5–10 cm across; bracts absent, occasionally 1, ca. 2 mm; rays 15–25, 2–4 cm, unequal, scabrid; bracteoles 1–2, linear, ca. 1.5 mm, or absent; umbellules 5–8 mm across, 15–30-flowered, polygamous; pedicels 2–3 mm, subequal, filiform, those of fertile flowers elongating to 6 mm in fruit. Calyx teeth obsolete. Petals white, oblong-ovate, apex mucronate, not inflexed. Stylodium conic; styles 2–4 × stylodium, reflexed. Fruit cordate-ovoid, ca. 1.5 × 1.5 mm, glabrous; vittae 3 in each furrow, 4–6 on commissure. Seed face slightly concave. Fl. May–Jul, fr. Aug–Sep.

- Forests, forest margins, grasslands, streamsides; 1500–3100 m. Gansu, W Hubei, Shaanxi, Sichuan.


**Pimpinella chuan e hui qin**

Plants perennial, 50–100 cm, stout, essentially glabrous. Root cylindrical, ca. 8 × 0.7 cm. Stem 3–5-branched. Basal petioles 18–25 cm; blade 2-ternate; leaflets oblong-ovate or oblong-rhombic, 4–12 × 2–10 cm, margins coarsely serrate or irregularly incised. Calyx leaves similar to basal, 1-pinnate or 3-lobed. Umbels 5–10 cm across; bracts absent, occasionally 1, ca. 2 mm; rays 15–25, 2–4 cm, unequal, scabrid; bracteoles 1–2, linear, ca. 1.5 mm, or absent; umbellules 5–8 mm across, 15–30-flowered, polygamous; pedicels 2–3 mm, subequal, filiform, those of fertile flowers elongating to 6 mm in fruit. Calyx teeth obsolete. Petals white, oblong-ovate, apex mucronate, not inflexed. Stylodium conic; styles 2–4 × stylodium, reflexed. Fruit ovoid, ca. 1.5 × 1.5 mm, glabrous; vittae 3 in each furrow, 4–6 on commissure. Seed face slightly concave. Fl. May–Jul, fr. Aug–Sep.

- Forests, among shrubs, alpine meadows, moist grassland along streams; 900–3700 m. Gansu, Guizhou, Hebei, Henan, Shaanxi, Sichuan.

34a. Pimpinella rhomboidea var. rhomboidea

**ling ye hui qin (yuan bian zhong)**

Basal leaves 2-ternate; ultimate segments 5–8 × 2–5 cm.

- Forests, among shrubs, moist grassland along streams; 900–3700 m. Gansu, Guizhou, Hebei, Henan, Shaanxi, Sichuan.

34b. Pimpinella rhomboidea var. tenuiloba

Basal leaves 2-ternate; ultimate segments 1–1.5 × 0.5–1 cm.

- Alpine meadows; 2600–3400 m. W Sichuan.


**Pimpinella chi hong hui qin**

Plants perennial, 30–80 cm, glabrous (pubescent only along abaxial leaf veins and at base of umbels and umbellules). Root cylindrical, 5–20 × 0.5–1 cm. Stem 1–2-branched. Basal petals 3–25 cm; blade triangular-ovate in outline, 2-ternate, or 1–2-pinnate; pinnae 2–3 pairs; ultimate segments ovate or oblong-ovate, 1.5–5 × 0.5–3.5 cm, margins serrate or incised. Cauline leaves similar to basal, 1-pinnate or 3-lobed, lobes lanceolate. Umbels 3–6 cm across; bracts 1–2, linear or like uppermost leaf, 8–15 mm, or absent; rays 10–17, 2–6.5 cm, unequal, pubescent; bracteoles 2–3, linear, 3–6 mm, ca. equal to pedicels; umbellules 9–11 mm across, 10–20-flowered; pedicels 1.5–3.5 mm, unequal. Calyx teeth conspicuous, linear-lanceolate, 0.3–0.8 mm, unequal. Petals purple, oblong-ovate or broad-ovate, base shortly clawed, apex mucronate, without incurred lobe. Stylodium short conic, or flat; styles 0.5–1.5 × stylodium, spreading. Fruit ovoid, ca. 1.7 × 1.1 mm, base cordate, surface glabrous; vittae 3 in each furrow, 4 on commissure. Seed face slightly concave. Fl. Jul–Aug, fr. Sep–Oct.

- Forests, among shrubs, grasslands, alpine meadows; 3000–3800 m. NW Yunnan [N Myanmar].


**Pimpinella xia mai hui qin**

Plants perennial, 10–30 cm, slender, glabrous. Taproot slen-
Aegopodium brachycarpum

ed, apex short, narrow. Stylopodium domed; styles 1–1.5 × stylo-
minute, triangular, ca. 0.2 mm. Petals purple, base shortly claw-
flexed; umbellules 6–8-flowered; pedicels 3–5 mm. Calyx teeth
minute, ca. 2 × 1 mm, glabrous; vittae 3 in each furrow, 4–6 on
commissure (mature fruit not known). Seed face plane. Fl. & fr.
Sep–Oct.

Among dwarf shrubs, alpine valleys, grassland along streams;
4100–4500 m. S Xizang (near Nyalam) [Nepal].

This incompletely known taxon is recorded only from a few col-
lections. The slender, glabrous stem, inconspicuous calyx teeth, clawed
petals, and ellipsoid fruit resemble Sinocarum, and further work is
needed.

37. Pimpinella liiana M. Hiroe, Umbell. Asia 1: 60. 1958

景东茴芹

Plants perennial, 30–60 cm, mostly glabrous. Root fusi-
form. Basal petioles 8–15 cm; blade 2-ternate; ultimate seg-
ments ovate, rhombic, 2.5–7 × 1.5–5 cm, abaxially glaucous,
sparingly pubescent, margins serrate, or incised. Cauline leaves
similar to basal, 1-pinnate or 3-lobed; lobes ovate or lanceolate,
20–30 × 5–10 mm. Umbels 6–8 cm across; bracts absent; rays
6–15, 3–5 cm, unequal; bracteoles 1–7, linear, 3–4 mm, ca.
equal to or shorter than pedicels; umbellules ca. 12 mm across,
10–20-flowered; pedicels 1.5–6 mm. Calyx teeth conspicuous,
lanceolate, ca. 0.3 mm. Petals white, ovate or broad-ovate, apex
cuneate, without incurved lobe. Stylopodium conic; styles
2–3 × stylopodium. Fruit ovoid-ovoid, ca. 2.5 × 1.5 mm, base
cordate, glabrous; vittae 3 in each furrow, 4 on commissure.

- Forests, grassy slopes; 1200–2400 m. W Yunnan [Jingdong].

This incompletely known taxon is recorded only from a few col-
llections.


短果茴芹

Pimpinella calycina Maximowicz var. brachycarpa

Aegopodium brachycarpum (Komarov) Schischkin; Spuriopim-
pinella brachycarpa (Komarov) Kitagawa.

Plants perennial, 70–85 cm, essentially glabrous. Root fi-
brous. Stem 2–3-branched. Basal petioles 6–10 cm; blade ter-
inate, rarely 2-ternate; leaflets pubescent on veins, margins cos-
spously serrate; lateral leaflets ovate, 3–8 × 4–6.5 cm; terminal leaf-
lets broad-ovate, 5–8 × 4–6 cm. Cauline leaves similar to basal,
sessile, 3-lobed, lobes lanceolate. Umbels 3–6 cm across; bracts
absent, rarely 1–3, linear, 5–12 mm; rays 7–15, 2–4 cm; brac-
teoles 2–5, linear, 2–5 mm, shorter than pedicels; umbellules
ca. 10 mm across, 15–20-flowered, polygamous; pedicels 2–4
mm. Calyx teeth conspicuous, lanceolate, ca. 0.3 mm. Petals
white, obcordate, apex with small incurved lobe. Stylopodium
conic; styles 2–3 × stylopodium. Fruit ovoid, ca. 2 × 1.8 mm,
base cordate, surface glabrous; vittae 2–3 in each furrow, 6 on

Forest margins, river banks; 500–900 m. Guizhou, Hebei, Jilin,
Liaoning, Shanxi [N Korea, SE Russia].


朝鲜茴芹

Pimpinella nikoensis Y. Yabe var. koreana Y. Yabe, Bot.
Mag. (Tokyo) 17: 106. 1958; Spuriopimpinella koreana (Y.
Yabe) Kitagawa.

Plants perennial, 40–60 cm, essentially glabrous. Root fi-
brous. Stem 2–3-branched. Basal and lower petioles 5–12 cm;
blade 1–2-ternate; lateral leaflets ovate or oblong-ovate, termi-
nal leaflets rhombic, 3–10 × 1–5 mm, pubescent on veins, mar-
gins coarsely serrate or incised. Upper leaves smaller, sessile,
3-lobed, lobes ovate or lanceolate. Umbels 4–6 cm across; bracts
absent, occasionally 2–3, linear, ca. 5 mm; rays 5–15, 3–4 cm;
bracteoles 2–6, linear-lanceolate, 1.5–2.5 cm, ca. equal to or
shorter than pedicels; umbellules 6–12 mm across, 10–20-flow-
ered, polygamous; pedicels 1.5–5 mm, very unequal. Calyx teeth
conspicuous, lanceolate, 0.4–0.6 mm, unequal. Petals white, apex
with incurved lobe. Stylopodium conic; styles ca. 2 × stylopo-
dium, reflected. Fruit ovoid, ca. 1 × 0.8 mm, base cordate, gla-
brous; vittae 2–3 in each furrow, 4 on commissure. Seed face

Forests, moist grassland along streams; 500–1500 m. Zhejiang
[Japan, Korea].


Saint-Pétersbourg 19: 182. 1873.

具萼茴芹

Spuriopimpinella calycina (Maximowicz) Kitagawa.

Plants perennial, ca. 40 cm, essentially glabrous. Root fi-
siform, sometimes clustered. Stem branched. Basal petioles 4–6
cm; blade 2-ternate; leaflets ovate or oblong-ovate, 1–2 × 1.5–
cm. Cauline leaves similar to basal, petiole up to 15 cm; blade
1–2-ternate; lateral leaflets oblong-ovate or ovate, usually 2-
lobed, terminal leaflets oblong-rhombic, 4–10 × 2–4 cm, pubes-
cent on veins, 3-lobed, lobes lanceolate. Umbels (3–)6–10 cm
across; bracts 3–5, linear-lanceolate, 3–8 mm, sometimes like
uppermost leaf; rays 6–12(–15), 2–4(–8) cm, subequal; brac-
teoles 5(–8), linear-lanceolate or subulate, 1–2 mm, shorter than
pedicels; umbellules 4–10 mm across, 10–15-flowered; pedi-
cels 3–6 mm, very unequal. Calyx teeth conspicuous, lanceolate
or narrowly triangular, 0.5–0.8 mm. Petals white, obovate or
obcordate, apex with incurved lobe. Stylopodium conic; styles
2–3 × stylopodium. Fruit oblong-ovoid, ca. 5 × 2 mm, glabrous;
vittae 2–3(–4) in each furrow, 4 on commissure. Seed face

Thickets, grassy slopes. NE China (unlocalized specimen) [Japan,
Korea].

谷生茴芹 gu sheng hui qin

Plants perennial, 50–100 cm, glabrous. Root cylindrical, 10–15 × ca. 0.5 cm. Stem purplish. Basal petioles 3–12 cm; blade 3–4-pinnate; ultimate segments linear, 5–25 × 1–2 mm. Cauline leaves similar to basal, 1-pinnate or 3-lobed. Umbels 5–10 cm across; bracts absent; rays 6–10, 1–2.5 cm, unequal; bracteoles 3–7, linear, 3–4 mm, ca. equal to or shorter than pedicels; umbellules 5–15 mm across, 6–13-flowered; pedicels 4–6 mm. Calyx teeth conspicuous, acute or subulate, ca. 0.3 mm. Petals white, apex with incurved lobule. Stylopodium conic; styles 2–3 × stylopodium, recurved. Fruit oblong-ovoid, 2.5–3 × 1.5–2 mm; glabrous; vittae 3 in each furrow. Seed face plane. Fl. Jul–Aug, fr. Sep–Nov.

- Shaded valleys, grassy slopes; 400–1200 m. SE Gansu, E Huabei, S Shaanxi, NE Sichuan.


多花茴芹 duo hua hui qin

Plants perennial, 80–100 cm, glabrous. Root cylindrical, ca. 10 × ca. 0.4 mm. Stem 2–3-branched, base clothed with fibrous remnant sheaths. Basal petioles 5–10 cm; blade triangular in outline, 10–15 × 5–10 cm, ternate-2-pinnate, primary pinnae 4–5 pairs; ultimate segments broad-ovate or suborbicular, 1–2 × 1–1.5 cm, margins coarsely serrate. Cauline leaves similar to basal, smaller, ternate-1-pinnate or 3-lobed. Umbels 6–8 cm across, mainly terminal, lateral umbels 2–3; bracts 1–3, lanceolate, 16–20 × 1–2 mm; rays 6–8, 4–6 cm, subequal; bracteoles 4–6, linear, 3–4 mm; umbellules 5–8 mm across; many-flowered; pedicels 4–6 mm. Calyx teeth conspicuous, triangular, ca. 0.3 mm. Petals white, broad-ovate, apex slightly incurved. Stylodium domed; styles ca. 1 × stylodium. Fruit ovoid, ca. 4 × 2.5 mm, base cordate; vittae 3 in each furrow, 2 on commissure. Seed face plane. Fl. Jun–Jul, fr. Jul–Sep.

- Valley forests; ca. 2700 m. S Xizang (Lhünzê).

This species is recorded only from a few collections.


锐叶茴芹 rui ye hui qin

Plants perennial, 40–100 cm, glabrous. Root fusiform or napiform, 3–6 × ca. 0.7 cm. Stem 2–3-branched. Basal petioles 6–10 cm; blade 2–3-ternate; ultimate segments ovate-lanceolate or rhombic, 2–6 × 1–2 cm, abaxially pubescent on veins, margins sharply serrate, apex acuminate or caudate. Cauline leaves similar to basal, 2-ternate or 3-lobed. Umbels 1.5–4 cm across; bracts (0–)2–6, linear, ca. 2 mm; rays 9–20, 2–7 cm, very unequal; bracteoles 3–8, linear-filiform, ca. 1 mm, shorter than pedicels; umbellules 5–8 mm across, 10–25-flowered, polygamous; pedicels 2–3 mm, elongating to 7 mm in fruit. Calyx teeth conspicuous, lanceolate, ca. 0.5 mm. Petals white, obovate, apex with incurved lobule. Stylodium conic; styles 2–3 × stylodium, reflexed. Fruit ovoid, ca. 4 × 3 mm, base cordate, surface glabrous; vittae 3 in each furrow, 4 on commissure. Seed face plane. Fl. Jun–Aug, fr. Aug–Oct.

- Coniferous forests, grassland and scrub at forest margins; 1300–3400 m. Gansu, Guizhou, Hebei, Henan, Huabei, Shandong, Sichuan.


辽冀茴芹 liao ji hui qin


Plants perennial, ca. 1 m, pubescent. Root fusiform. Stem 3–4-branched. Basal petioles 7–20 cm; blade 1–3-ternate; ultimate segments ovate or ovate-lanceolate, 2–8 × 1–4 cm, abaxially glaucous, pubescent on veins, margins crenate or serrate, apex acuminate. Cauline leaves similar to basal, 2-3-ternate. Uppermost leaves 3-lobed, lobes lanceolate. Umbels 4–6 cm across; bracts absent; rays 9–15, 2–3.5 cm, unequal; bracteoles 1–3, linear, 5–10 cm, ca. equal to or shorter than pedicels; umbellules 8–12 mm across, 10–15-flowered; pedicels 5–15 mm. Calyx teeth conspicuous, lanceolate, 0.3–0.5 mm. Petals white, ovate or obovate, apex with incurved lobule. Stylodium conic; styles 2–3 × stylodium. Fruit cordate-ovoid, ca. 2 × 1.5–2 mm, glabrous; vittae 3 in each furrow, 4 on commissure. Seed face plane. Fl. and fr. Jun–Sep.

- Grassy slopes, grassland along streams. Hebei, Heilongjiang, Liaoning [N Korea].

The following species have been described from Chinese material, but are imperfectly known as no specimens have been seen or the specimens are inadequate.


*Pimpinella tagawae* M. Hiroe (Umbell. Asia 1: 61. 1958 ["tagawai"]), described from Taiwan ("Taipei" [Taipei], 1000–2000 m, M. Tagawa 105, holotype, KYO).


丝瓣芹属 si ban qin shu

Pan Zehui (潘泽惠); Mark F. Watson, Ingrid Holmes-Smith

Herbs biennial or perennial, essentially glabrous. Rhizome tuberous, globose or conic, roots fibrous. Stem erect, ribbed. Basal leaves petiolate, sheathed at base; blade broad-triangular or broad-ovate, 1–3-ternate-pinnate; ultimate segments of distal leaves often linear. Umbels compound, terminal and lateral; bracts and bracteoles often absent; rays unequal. Calyx teeth obsolete or conspicuous, triangular. Petals white or purple-red, ovate to ovate-lanceolate, apex long-linear or long- aristate, rarely acute or obtuse, stated petal lengths include the apex. Stylodium depressed or low-conic; styles short, reflexed. Fruit ovoid, broad-ovoid, ovoid-oblong or oblong-elliptic, slightly flattened laterally, glabrous; ribs 5, filiform; vittae 1–3 in each furrow, 2–4 on commissure. Seed face plane. Carpophore usually bifid or 2-parted.

About 25 species: high-altitude Sino-Himalayan region from E Nepal to SW China; 20 species (14 endemic) in China.

This is a taxonomically complex genus with often indistinct species boundaries and problematic generic delimitation with *Sinocarum* (see the taxonomic note under that genus).

1a. Ultimate segments of basal and lower leaves linear or linear-lanceolate.

2a. Ultimate leaf segments 2–5 mm wide; petals apex long-linear.

3a. Rays (5–)8–13, (1.5–)3–5.5 cm; calyx teeth conspicuous, ovate-triangular .............................................................. 1. *A. schneideri* 2b. Ultimate leaf segments 1–2.5 mm wide; petals apex acute or obtuse-acute.


1b. Ultimate segments of basal and lower leaves ovate or ovate-lanceolate.


6a. Rays 1–2 cm; petals apex linear .......................................................................................................................... 5. *A. tenerum* 6b. Rays less than 1 cm; petals apex short-acute, not linear ........................................................................ 6. *A. minus*

5b. Bracteoles absent.

7a. Calyx teeth developed.


9a. Leaf blade 2-ternate; petals white or pink; calyx teeth ca. 0.2 mm ........................................................................ 9. *A. handelii* 9b. Leaf blade 2–3-ternate-pinnate; petals purple-red; calyx teeth ca. 3 mm ......................................... 9. *A. forrestii*

7b. Calyx teeth obsolete.

10a. Petals apex acute; fruit oblong, apex slightly separated .................................................................................. 10. *A. chinense* 10b. Petals apex linear or ciliate-acute; fruit ovoid to broad-ovoid, apex not separated.

11a. Plants 4–25 cm (*A. nervosum* may be taller); basal and cauline leaves homogeneous; lateral umbels 1–2.

12a. Leaves 1–2-ternate.


14a. Leaflets 2–3 mm wide, entire or 3-toothed ................................................. 13. *A. nervosum* 14b. Leaflets ca. 3 mm wide, irregularly pinnatifid or 3-lobed ................. 14. *A. handelii*

11b. Plants 25–80 cm; basal and cauline leaves heteromorphic; lateral umbels often numerous.

15a. Rays ca. 1 cm; pedicels 1–2 mm; petals white ............................................ 15. *A. brevipedicellatum* 15b. Rays 1.5–6 cm; pedicels 3–15 mm; petals purple, pink or white.

16a. Leaflets of basal leaves entire or apex 2-toothed; rays subequal ............ 16. *A. xizangense* 16b. Leaflets of basal leaves apex 3-lobed, irregularly coarse-toothed or serrate; rays unequal.

17a. Basal leaves 1–2-ternate-pinnate; rays very unequal .................................. 17. *A. gracile* 17b. Basal leaves 2–3-pinnate; rays unequal or slightly unequal.

17a. Petals white (sometimes purple), apex densely papillate .............. 18. *A. hookeri* 17b. Petals purple or white with purplish-red margin, apex glabrous or papillate.

18a. Leaves 2-pinnate, lower pinnae short-petiolulate, leaflets ca. 6 mm wide ............................................. 19. *A. commutatum* 18b. Leaves 2–3-pinnate, primary and secondary pinnae all long-petiolulate, leaflets 7–15 mm wide ................. 20. *A. paniculatum*

条叶丝瓣芹 条叶丝瓣芹


禾叶丝瓣芹 禾叶丝瓣芹


条叶丝瓣芹 条叶丝瓣芹

Carum tenerum (de Candolle) Franchet; Pimpinella tenera (de Candolle) C. B. Clarke.

Plants 5–30 cm. Rhizome narrowly conic, or elongate-globose, ca. 5 mm across. Stem solitary, slender. Basal leaves petiolate, petioles 2–5 cm, sheaths narrowly lanceolate; blade triangular, 1.5–2 × 1.5–3 cm, 2–3-terrate-pinnate; ultimate segments cuneate-obovate or obovate, ca. 5 × 5 mm, apex often 3-toothed. Umbels 2–3 cm across; peduncles 2–5 cm, slender; bracts usually absent; rays 3–4, 1–2 cm, unequal; bracteoles 1–3, 2–3 mm; umbellules 6–14 mm across, 3–5-flowered; pedicels 2–7 mm, unequal. Calyx teeth obsolete. Petals purple-red, ovate, ca. 2 mm; apex linear, ca. 1 mm. Fruit broad-ovoid, ca. 1–1.5 × 1–1.5 mm; vittae minute, 2 in each furrow, 2 on commissure. Fl. Aug.

Damp shady crevices; 3400–3500 m. E Xizang, NW Yunnan [Bhutan, NE India, E Nepal, Sikkim, N Thailand].

Despite this species being the most widespread in the genus, fruiting material is still lacking for many areas (including China). This species is similar and closely related to Acronema hookeri, with which larger specimens of A. tenerum can be confused. The presence of bracteoles and shorter petal apices are useful in recognizing such specimens of A. tenerum.


Plants 3–5 cm. Rhizome tuberous, ovoid, 3–5 mm across. Stem solitary, thinly ribbed. Lower stem leaves petiolate, petioles 2–5.5 cm, sheaths short; blade broad-triangular, 4–7 × 5–8 mm, 2-terrate-pinnate; pinnae short-petiolulate, second pinnae broad-ovate, 3-loped; ultimate segments, 1.2–1.5 × 0.7–1 mm, entire or middle ones 2–3-toothed, teeth 1–2 mm. Upper stem leaves none. Umbels 0.5–1 cm across; peduncles, 2.5–3 cm, slender; bracts 1–3, linear, 2–3 mm; rays 3–7, 1.5–5 mm; bracteoles 2–4, ca. 1 mm, shorter than pedicels; pedicels 3–5, ca. 2 mm. Calyx teeth obsolete. Petals white, ovate, ca. 1 mm; apex short-acute, not linear. Young fruit, oblong-ellipsoid, ca. 1 mm (mature fruit not known). Fl. Jun–Jul.

Mountain slopes; 3000–4600 m. S Xizang, NW Yunnan [Bhutan].

This species was misidentified in FRPS (55(2): 119–121. 1985) as Acronema hookeri (de Candolle) Franchet; Sinocarum wolffianum Fedde ex H. Wolff (Sinocarum wolffianum (Fedde ex H. Wolff) P. K. Mukherjee & Constance, 1991, not (Fedde ex H. Wolff) R. H. Shan & F. T. Pu, 1993), which is endemic to Bhutan and Sikkim.


Plants 5–30 cm. Rhizome tuberous to long conic, 1–3 × 0.5–1 cm. Stem solitary, thinly ribbed, little-branched. Basal leaves petiolate, petioles 4–8 cm, sheaths short, narrow; blade semi-orbicular or broad-triangular in outline, 1.5–3.5 × 2–5 cm, 3-lobed or 3-foliolate; ultimate segments ovate to obovate, 1–2.5 × 0.8–2 cm, base cuneate, incised-serrate distally, adaxially purple-green, abaxially dark purple. Upper stem leaves conspicuously heteromorphic; ultimate segments becoming linear, 15–75 × 0.5–5 mm, entire. Umbels 4–9 cm across in flower (to 12 in fruit); peduncles (2–)4.5–10 cm; bracts and bracteoles absent; rays 5–12, (0.8–)1.5–6 cm, unequal; umbellules 9–18 mm across, 7–12-flowered; pedicels 5–15 mm, unequal, slender, scabrous along one side; rays and pedicels elongating and spreading in fruit. Calyx teeth conspicuous, narrow-triangular, ca. 0.3 mm. Petals white, greenish-white or purple, ovate or ovate-lanceolate, 2–3 × ca. 0.5 mm; apex linear, ca. 1 mm, papillate-hairy abaxially. Fruit subovoid, ca. 2 × 2 mm. Fl. Aug–Oct, fr. Sep–Nov.

● Forests, grassy slopes; 2800–4000 m. W Sichuan, NW Yunnan.


Plants 15–30 cm, slender. Rhizome tuberous, ovoid, 3–25 × 4–7 mm. Stem thinly ribbed. Lower stem leaves petiolate, petioles 2–5.5 cm, sheaths short, blade broad-angular, 3.5–10 × 6–12 cm, 2-terrate-pinnate; pinnae remote, pedi- lules 2–5 cm, pinnule pedi- lules 0.2–2.5 cm, semi-orbicular, 0.5–1.5 × 0.6–1.7 cm, apex 3-lobed, lobes obovate, 2–3-toothed. Uppermost leaves reduced, segments linear, entire or sparsely incised-serrate. Umbels 2–5 cm across; peduncle 3–6 cm, slender; bracts absent or 1; rays 3–6, 1.5–4.5 cm, very unequal; bracteoles absent; umbellules 5–10 mm across, 3–10-flowered; pedicels 2–9 mm, unequal, spreading in fruit. Calyx teeth triangular, minute, ca. 0.2 mm. Petals white or pink, ovate-lanceolate, ca. 3 × 0.6 mm; apex linear, ca. 2 mm. Fruit broad-ovoid, ca. 2 × 3 mm, base cordate; vittae 2–3 in each furrow, 2–4 on commissure. Fl. Jun–Jul, fr. Aug–Sep.

● Forests, damp shady crevices; 3200–4000 m. S Qinghai, SW Sichuan, Xizang, NW Yunnan [Bhutan, ?Sikkim].

Plants from the E Himalayas are smaller (2.5–6.5 cm), with almost sessile, lax umbels. They may represent a different, as yet undescribed species, but further work and new collections are needed to confirm this.


Plants ca. 40 cm high. Root tuberous, elongate, ca. 12 × 7 mm. Stem ribbed, little-branched above. Lower leaves petiolate, petioles 7–13 cm, slender, sheaths narrowly lanceolate; blade triangular-ovate, 4–6 × 3.5–5 cm, 2–3-terrate-pinnate; pinnae 3 pairs, peti- lules of proximal pinnae ca. 5 cm; ultimate segments oblong or cuneate-oblung, 3–8 × 0.5–2 mm, entire or apex sparsely obtuse-toothed. Umbels 5–7 cm across; peduncles 2.5–4 cm; bracts and bracteoles absent; rays 8–12, up to 4 cm, very unequal, slender, scabrous on inner surface; umbellules 6–11 mm across, 10–15-flowered; pedicels 3–5 mm, scabrid. Calyx teeth narrowly triangular, ca. 3 mm. Petals purple-red, narrowly lanceolate, 2–3 × 0.5–0.75 mm; apex long-linear, ca. 1 mm. Ovary broad-ovoid. Stylopodium depressed. Fruit unknown. Fl. Sep.

尖瓣芹 jian ban qin

Plants 5–75 cm. Root tuberous, globose, 3–4 mm across. Stem slender, thinly ribbed. Basal leaves petiolate, petioles 2–5 cm, sheaths short; blade broad-triangular, 2–5 × 3–6 cm, 2-termate-pinnate; pinnae petiololes ca. 7 mm; ultimate segments cusinate-obovate, ca. 4 × 3 mm, sub sessile, apex 3-toothed. Stem leaves long-petiolate, petioles 1–4 cm; ultimate segments rhombic-ovate, ca. 2 × 1 mm, apex incised-serrate. Umbels 2–5 cm across; peduncles 0.5–13 cm; bracts absent or 1, linear; rays 3–7, 2–5 cm, distinctly unequal; bracteoles absent; umbellules 7–10 mm across, 3–8-flowered; pedicels 2–10 mm, distinctly unequal. Calyx teeth obsolete. Petals white, ovate, ca. 1 × 0.5 mm; apex acute. Fruit oblong, ca. 2 × 1.2 mm, apex slightly separated; ribs filiform; vittae 1 in each furrow, 2 on commissure. Fl. Jul, fr. Aug–Sep.

10a. var. chinense

Plants (30–)75 cm; peduncles 4–13 cm.


矮尖瓣芹 ai jian ban qin

Plants small, 5–10 cm. Petioles short, 0.5–1.5 cm. Fl. Jul, fr. Aug–Sep.

10a. Acronema chinense var. chinense

尖瓣芹(原变种) jian ban qin (yuan bian zhong)

Pimpinella chinensis (H. Wolff) M. Hiroe.

Plants (15–)30–75 cm. Peduncles 10–13 cm.

10b. Acronema chinense var. humile


羽轴丝瓣芹 yu zhou si ban qin

Plants 4–10 cm. Root tuberous, ovoid, 7–9 × 4–5 mm, thick. Stem purplish, branched. Basal leaves petiolate, petioles 1–1.5 cm, sheaths ovate-oblong; blade ovate or broad-ovate, 0.8–1.1 × 1.1–1.3 cm, 2-termate; leaflets sessile, ovate to obvate, ca. 2 × 1.5 mm, apex toothed. Umbels ca. 2 cm across; peduncles ribbed, 1–2 cm; bracts and bracteoles absent; rays 5–7, 1–2 cm, unequal, 4-angled; umbellules 0.5–0.6 mm across, 2–3-flowered; pedicels 1–3 mm. Calyx teeth obsolete. Petals color unknown, ovate, ca. 1.8 × 0.7 mm; apex linear. Stylopodium depressed, purple-black. Fruit ovoid, ca. 1.8 × 1.5 mm, base cordate; vittae unknown. Fl. Jul, fr. Aug.


高山丝瓣芹 gao shan si ban qin

Plants 10–25(–40) cm. Root tuberous, ovoid, ca. 5 mm across. Stem solitary, slender, little-branched. Basal leaves petiolate, petioles ca. 5 mm, slender, sheaths small; blade broad-triangular, 2.2–3 × 1.5–2.5 cm, 2-termate-pinnate; pinnae petiolo- late; ultimate segments obovate to linear-lanceolate, 5–8 × 2–3 cm, entire or 3-toothed, margins and adaxial veins minutely pubescent. Umbels 1.5–3 cm across; peduncles short; bracts and bracteoles absent (bracts occasionally 1); rays 3–6, 1.5–2.7 cm, slender; umbellules 5–12 mm, 3–9-flowered; pedicels 2–9 mm, unequal, spreading and elongating in fruit. Calyx teeth obsolete. Petals white, yellowish-white, or purple, ovate-lanceolate, 2–3 × ca. 0.5 mm; apex linear, ca. 1.5 cm. Stylopodium depressed. Fruit ovoid, ca. 1.5 × 1.5 (mature fruit unknown). Fl. Aug–Sep, fr. Sep–Oct.


高海拔丝瓣芹 gao hai bai si ban qin

Plants 5–75 cm. Root tuberous, globose, ca. 10 × 3–5 mm. Stem solitary, slender and ribbed. Basal leaves petiolate, peti-
oles 2.5–3.5 cm, slender, sheaths short; blade broad-ovate, 1.5–2.5 × 1.5–2.5 cm, 1–2-ternate-pinnate; pinnate petiolulate; ultimate segments obovate or ovate, ca. 1 × 0.7 cm, base cuneate, margin irregularly pinate or apex 3-lobed. Umbels 2.5–5 cm across; peduncles 2.5–4 cm, slender; bracts and bracteoles absent; rays 4–6, 1–3 cm, unequal; umbellules 5–10 mm across, 3–9-flowered; pedicels ca. 5 mm. Calyx teeth obsolete. Petals white, ovate or ovate-lanceolate, 2–2.5 × ca. 0.5 mm; apex linear, 1–1.5 mm. Young fruit broad-ovoid, base cordate, ca. 1.5 mm (mature fruit unknown). Fl. and fr. Jul.–Aug.

Damp forests, open pastures; 3400–4000 m. NW Yunnan [7NE India, Myanmar].

This rather poorly known taxon is recorded only from a few collections.


短柄丝瓣芹 xi zang si ban qin

Plants 10–40 cm. Root tuberous, subglobose, ca. 0.7 mm thick. Stem branched. Lower leaves petiolate, petiolo 4.5–9 cm, sheaths very small; blade triangular or broad-triangular, 2.5–5.5 × 2.6–4 cm, ternate-pinnate; pinnae 2–3 pairs, proximal pinnate short-petiolulate, broad-ovate, 1.3–2 × ca. 1.5 cm, apex 3–5-toothed. Leaflets of upper leaves ovate to linear. Umbels 2.5–3.5 cm across; peduncles ca. 3 cm; bracts and bracteoles absent; rays 5–7, ca. 1 cm, unequal; umbellules 2.3–3 mm across, 6–9-flowered; pedicels very short, 1–2 mm or subsessile. Calyx teeth obsolete. Petals white, ovate-lanceolate, ca. 2 × 0.5 mm; apex long-acuminate. Young fruit ovoid, ribs filiform (mature fruit unknown). Fl. Aug.

- Damp forests; 3300–3800 m. Xizang, Yunnan.

This incompletely known taxon is recorded only from a few collections. It was misidentified in FRPS (55(2): 128, fig. 51(part 10). 1985) as the E Himalayan Acronema radiatum (W. W. Smith) H. Wolff (Pimpinella radiata W. W. Smith; currently accepted as Pternopetalum radiatum (W. W. Smith) P. K. Mukherje & Constance).


西藏丝瓣芹 xi zang si ban qin

Plants 30–40 cm. Root slender, cylindric, ca. 3 cm. Stem solitary, thin-ribbed. Basal leaves petiolate, petiolo 7–11 cm, slender, sheaths short; blade broad-ovate or broad-triangular, 1–2-pinnate; pinnae 1.5–2 cm, 3-lobed, petiolo 0.5–1.2 cm; ultimate segments ovate to long-elliptic, 7–10 × 0.3–0.4 mm, entire or 2-toothed distally, margin and nerves scabrous adaxially. Umbels 2.5–3 cm across; bracts and bracteoles absent; rays 6–9, ca. 3 cm, subequal; umbellules 5–7 mm across, 7–13-flowered; pedicels 2.5–4 mm, slender. Calyx teeth obsolete. Petals white, ovate-lanceolate, 1.8–2.2 × ca. 0.6 mm; apex linear, 0.6–0.8 mm. Fruit broad-ovoid, ca. 1.8 × 2 mm, base subtruncate to slightly cordate; vitiae unknown. Fl. Sep, fr. Oct.

- Valley sides; ca. 3400 m. Sichuan, Xizang.

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


细梗丝瓣芹 xi geng si ban qin

Plants 18–40 cm. Root tuberous, ovoid, 5–7 mm across. Stem ribbed, slightly branched. Basal leaves petiolate, petiolo 7–13 cm, sheaths small; blade triangular, 4.5–5.5 × 5–6 cm, 1–2-ternate-pinnate; pinnate broad-triangular, 2–4 × 1.5–3.5 cm, 3-lobed or entire, petiolo 1–1.8 cm; ultimate segments obovate, base cuneate, cuspidate-serrate distally, scabrous along nerves adaxially. Umbels 2.2–3.4 cm across; peduncles slender; bracts and bracteoles absent; rays 5–6, 1–1.5 cm, very unequal; umbellules 6–7 mm across, 4.7–flowered; pedicels 1.6–3.5 mm, slender, unequal. Calyx teeth obsolete. Petals purple-red, broad-ovoid, 3.5–3.5 × ca. 1 mm; apex linear, 2–2.5 mm, glandular-pubescent. Mature fruit unknown. Fl. Jul.

- Forested ravines; 3300–3800 m. Xizang.

This poorly known taxon is recorded only from a few collections.


锡金丝瓣芹 xi jin si ban qin


Plants 30–80 cm. Root tuberous, globose, 8–10 × 5–8 mm across. Stem ribbed and branched, branches elongating. Basal petiolo 4–8 cm, sheaths narrow; blade ovate-triangular to long-ovate-triangular, 2-pinnate; proximal pinnate short-petiolulate; ultimate segments ovate, obliquely ovate to broad-ovate, 1–2 × 7–13 mm, 3-lobed or irregularly sparsely serrulate. Umbels 2–5 cm across, many in a lax, raceme-like inflorescence; peduncles 4.5–8 cm; bracts and bracteoles absent; rays 3–6, 2.5–6 cm, slightly unequal; umbellules 8–15 mm across, 3–7-flowered; pedicels 5–15 mm, slender, rays and pedicels elongating and spreading in fruit. Calyx teeth obsolete. Petals white, pink or dark red, lanceolate or oblong-lanceolate, ca. 4 × 0.6 mm; apex filiform, 2–3 mm, densely papillate. Fruit ovoid globose, ca. 2 × 2 mm, base subcordate; vitiae 2–3 in the furrows, 3–4 on commissure. Fl. Aug, fr. Sep–Oct.

Forests, riversides, streambeds; 2100–3200 m. S Xizang, NW Yunnan [Bhutan, NE India, E Nepal, Sikkim].

This widespread, quite variable species often grows in mixed populations with Acronema graminifolium, which some authors consider to be a variety of A. hookeri (as originally described as Pimpinella hookeri var. graminifolia).


多变丝瓣芹 duo bian si ban qin

Plants 16–60 cm. Root tuberous, globose, 2–10 mm across. Stem slender, thinly ribbed. Basal leaves petiolate, petiolo 2.5–5 cm, sheaths short, narrow; blade broad-triangular, 3–5 × 3–6 cm, 2-pinnate; pinnae 2–3 pairs, proximal pinnate short-petiolulate; ultimate segments broad-ovate to obovate, 5–12 × ca. 6 mm, apex 3-lobed or sparsely obtuse-serrate. Leaflets of the upper leaves linear. Umbels 5.5–7.5 cm across; peduncles 2.5–7 cm; bracts and bracteoles absent; rays 2–6, 1–3× (4.5) cm, unequal; umbellules 4–20 mm across, 2–5-flowered; pedicels 4–10 mm, slender, unequal. Calyx teeth obsolete. Petals purplish-red, narrow-lanceolate, ca. 4 × 0.2–0.3 mm; apex linear,
ca. 2 mm, finely papillate or glabrous. Fruit broad-ovoid, ca. 2 × 2 mm, base rounded or slightly cordate; ribs filiform; vittae 3 in each furrow, 4–6 on commissure. Fl. Aug, fr. Sep–Oct.

× 2 mm, base rounded or slightly cordate; ribs filiform; vittae 3 ca. 2 mm, finely papillate or glabrous. Fruit broad-ovoid, ca. 2 cm, base cordate; vittae 3 in each furrow, 2 on commissure. Seed face sub-plane. Carpophore bifid subpentagonal in cross section, commissure constricted; ribs prominent or narrowly winged, wings equal, usually erose, margins at apex.

Stem purplish at base, ribbed. Basal leaves petiolate, petioles

2. Harrysmithia franchetii

1b. Ultimate segments of basal leaves narrow, linear, 1–2.5 × 0.3–0.6 mm; fruit ribs prominent, carinate, entire ........................................... 2. H. franchetii

1a. Ultimate segments of basal leaves broad, lanceolate or ovate, 5–10 × 2–3 mm; fruit ribs narrowly winged, wings irregularly toothed ................................................................. 1. H. heterophylla


ceolate, serrate, dentate-divided or lobed. Upper leaves reduced, usually ternate-pinnate. Umbels compound, terminal and lateral; peduncles longer than the leaves; bracts and bracteoles usually absent; rays ascending-spreading. Calyx teeth obsolete. Petals white or pinkish, obovate, apex with narrow inflexed lobule. Stylopodium conic; styles long, reflexed. Fruit oblong, oblong-ovoid or ovoid, slightly flattened laterally, glabrous; mericarp subrounded in cross section; ribs filiform, prominent to obscure; vittae inconspicuous. Seed face plane. Carpophore bifid at apex.

About seven species: Asia, Europe; five species (two endemic) in China.

Aegopodium anthriscoides (H. de Boissieu) H. de Boissieu (Bull. Soc. Bot. France 56: 350. 1909; Carum anthriscoides H. de Boissieu, Bull. Soc. Bot. France 53: 426. 1906) was described from Chongqing (“Tehen-Kéou” [Chengkou], P. G. Farges s.n., holotype, P). However, it is not treated in this account as it is imperfectly known.

1a. Lower leaves ca. 23 cm, ternate-3–4-pinnate ................................................................. 5. A. handelii
1b. Lower leaves 3–15 cm, ternate-2-pinnate, rarely 3-pinnate.

2a. Petals with several purple-red nerves ................................................................................. 2. A. latifolium
2b. Petals with single nerve.

3a. Ultimate leaf segments broad-ovate, doubly serrate ........................................................... 3. A. tashikorum
3b. Ultimate leaf segments lanceolate or ovate-lanceolate, irregularly serrate.

4a. Ultimate leaf segments lanceolate, apex long-acuminate to caudate ........................................ 4. A. henryi
4b. Ultimate leaf segments ovate or ovate-lanceolate, apex acute to acuminate .......................... 1. A. alpestre


东北羊角芹  dong bei yang jiao qin

Aegopodium alpestre var. daucifolium Gorovoj; A. alpestre f. scabrum Kitagawa; A. alpestre f. tenerum Harara; A. alpestre f. tenuisectum Kitagawa; Carum alpestre (Ledebour) Koso-Poliansky.

Plants (20–)30–100 cm. Roots fibrous from an elongate, slender rootstock. Stem hollow. Basal petioles 5–13 cm; blade broad-triangular in outline, 3–9 × 3.5–12 cm, ternate-2-pinnate; ultimate segments long-ovate or ovate-lanceolate, 1.5–3.5 × 0.7–2 cm, sessile, base cuneate, irregularly sharp-serrate, apex acute to acuminate. Umbels 3–8 cm across; peduncles 7–15 cm; rays 9–17, 2–4.5 cm; umbellules 10–15 mm across, many-flowered; pedicels 3–10 mm, unequal. Petals white. Styles 2–3 × stylopodium. Fruit oblong or oblong-ovoid, 3–3.5 × 1.8–2.5 mm. Fl. and fr. Jun–Aug.

Mixed forests or grassy places on mountain slopes; 900–2200 m. Heilongjiang, Jilin, Liaoning, Nei Mongol, Xinjiang [Japan, Korea, Mongolia, SE Russia].

Plants from E Kazakhstan, C Asia to Pakistan, and NW India are sometimes included within Aegopodium alpestre, but we agree with those authors who recognize these western plants as a separate species, A. kashmiricum (R. R. Stewart ex Dunn) Pimenov.


宽叶羊角芹  kuan ye yang jiao qin

Plants 40–90 cm. Stem few-branched above. Basal petioles 5–20 cm; blade broad-triangular or rounded, 8–10 cm, width equaling or longer than the length, ternate-2-pinnate; pinnae 3–5; ultimate segments broad-ovate or obovate-oblong, 4–8 × 3–7 cm, base cuneate, glabrous on both surfaces, coarsely mucronate-dentate. Cauline leaves few, ternate-2-pinnate or 3-lobed. Terminal umbels ca. 6 cm across, lateral umbels smaller; rays 11–15, 2–3.5 cm, apical parts roughened; umbellules ca. 15 mm across. Petals white, purple-red nerves several. Styles ca. 2 × stylopodium. Fruit oblong, 3–3.5 × 2–2.5 mm. Fl. May.

Lower mountain slopes, grassy places; ca. 1000 m. Xinjiang [Russia (E Siberia)].

This is a rather poorly known species in China and was previously thought to be endemic to the Lake Baikal region of E Siberia.


塔什克羊角芹  ta shi ke yang jiao qin

Plants 70–100 cm. Stem shallowly fluted, subglabrous, few-branched above. Basal petioles 10–20 cm; blade broad-triangular, 10–15 cm, ternate-2-pinnate; pinnae petiolulate; petiolules 3–6 cm; ultimate segments subovate, 3–11 × 2–6 cm, undivided or 2–3-lobed, both surfaces slightly roughened, sharply serrate or doubly serrate. Upper leaves smaller, 3-lobed, lobes ovate or ovate-lanceolate, sharply serrate. Terminal umbels 5–9 cm across; rays 13–20, 2–5 cm, somewhat unequal, apical parts roughened; umbellules 10–15 mm across, pedicels 2–9 mm, unequal. Petals white. Styles ca. 2 mm, 4–5 × stylopodium. Fruit subovoid, 4–6 × ca. 3 mm. Fl. and fr. May–Jul.

Ferstes or grassy places on mountain slopes; ca. 1100 m. W Xinjiang (Xinyuan) [Kyrgyzstan, Tajikistan].

This is a rather poorly known species in China.


巴东羊角芹  ba dong yang jiao qin

Plants 45–100 cm. Stem terete, striped, subglabrous. Basal leaves long-petiolate, petioles 5–8 cm; blade broad-triangular, ca. 14 cm, ternate-2–3-pinnate; ultimate segments lanceolate, 1.5–4 × 0.8–1.5 cm, base subtruncate to cuneate, irregularly serrate, apex long-acuminate or caudate. Upper leaves smaller, pinnate, petioles wholly sheathing. Umbels 3.5–4 cm across; peduncles 6–20 cm; rays 8–18, 2.5–4.5 cm, roughened; umbellules ca. 1 cm across, many-flowered; pedicels ca. 4 mm, unequal. Petals white, obovate. Styles ca. 1 mm. Fruit oblong-ovoid or long-ovoid, 3–3.5 × 1.5–2 mm. Fl. and fr. Jun–Aug.

Lower mountain slopes; 500–1700 m. Gansu, W Hubei (Bu-
This species is treated as endemic to China as literature reports from NE India and Myanmar are here considered dubious.


湘桂羊角芹  xiang gui yang jiao qin

Plants 50–100 cm. Stem stout, terete, shallowly fluted, hollow, branches spreading. Lower leaves petiolate, petioles 4–7 cm; blade broad-triangular, ca. 23 cm, ternate-3–4-pinnate; ultimate segments ovate or broad-ovate, 1.5–2.5 × 1–1.5 cm, base cuneate, margins and nerves roughened on both surfaces. Upper leaves reduced, ternate-pinnate. Umbels 3–5 cm across; peduncles 8–15 cm, apex roughened; rays 9–11, 3–4(–6) cm, slightly roughened; umbellules 0.8–1.4 cm across, many-flowered; pedicels 3–10 mm, unequal. Petals white. Styles 1–2 × stylopodium. Fruit oblong-ovoid to long-ovoid, ca. 3.5 × 2 mm. Fl. and fr. Jul–Aug.

- Forests, among shrubs on valley sides; 800–1200 m. NE Guangxi (Longsheng), Guizhou, SW Hunan (Wugang), Zhejiang.


西归芹属  xi gui qin shu

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

Herbs, biennial, glabrous. Roots fusiform, woody. Stem solitary, erect, sparsely branched. Basal leaves petiolate, petioles sheathing; blade ternate-2-pinnate; ultimate segments linear-lanceolate. Umbels compound, terminal; bracts absent; rays unequal; bracteoles several, linear or lanceolate, entire. Calyx teeth obsolete. Petals white or purplish, obcordate, base cuneate, apex notched, with narrow inward curved lobule, outer petals of umbellules slightly larger (radiant). Stylopodium low-conic; styles ca. equal to stylopodium, reflexed. Fruit ovoid, slightly dorsally compressed, glabrous; dorsal and intermediate ribs narrowly winged, lateral wings often broader; vittae solitary in each furrow, 2 on commissure. Seed face plane. Carpophore 2-cleft to base.

Two species: C Asia; one species in China.


西归芹  xi gui qin

Plants 40–100 cm, glaucescant throughout. Stem purplish below, striate. Lower leaves petiolate, sheaths oblong-lanceolate; primary pinnae 3–4 pairs; ultimate segments linear-lanceolate, 20–90 × 1–5 mm. Upper leaves reduced, 1-pinnate, 3-lobed or entire, sessile on expanded sheaths. Primary umbels 5–9 cm across, lateral umbels smaller; rays 4–20, 2–7 cm, unequal; bracteoles 4–9, lanceolate, ca. 3 mm, usually equal to or longer than flowers, margins membranous; umbellules many-flowered, 10–12 mm across. Fruit 3–4 × ca. 2 mm. Fl. Jul, fr. Aug.

- Among shrubs, grassy slopes; 1500–2500 m. W Xinjiang (Tian Shan) [Kazakhstan, Kyrgyzstan].

This species has reputed medicinal value.


斑膜芹属  ban mo qin shu

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

Hymenolyma Korovin.

Herbs, perennial. Root turnip-shaped or fusiform, woody. Stem single, rarely 2, erect, profusely branched, base clothed with fibrous remnant sheaths. Basal leaves petiolate; blade oblong-ovate, 1–3-pinnate. Upper leaves reduced, 1-pinnate or 3-lobed, sessile on expanded sheaths. Umbels compound, terminal and lateral; bracts 5, margins broad membranous; rays unequal; bracteoles 5, similar to bracts. Calyx teeth obsolete. Petals white, obovate, base cuneate, apex notched with small incurved lobule. Stylopodium conic; styles ca. equal to stylopodium, divergent or reflexed. Fruit oblong-ovoid, somewhat dorsally compressed, commissure broad; ribs filiform or scabridulous; vittae solitary or 3–4 in each furrow, 2 or 6–10 on commissure. Seed face plane or slightly convex. Carpophore 2-cleft to base.

Six to ten species: C and SW Asia; two species in China.

1a. Bracteoles oblong, nerves 3, dark; vittae solitary in each furrow, 2 on commissure .......................... 1. H. trichophylla
1b. Bracteoles obovate, nerves 5–8 violet; vittae 3–4 in each furrow, 6–10 on commissure .............................. 2. H. bupleuroides


斑膜芹  ban mo qin


Plants 30–70 cm, glabrous or subglabrous. Rootstock fusiform. Basal petioles 2.5–4 cm; blade 2–3-pinnate; primary pinnae 5–8 pairs; ultimate segments filiform, 3–5 × 0.2–0.3 mm. Umbels 2–5 cm across; bracts oblong, ca. 10 mm; rays 8–15, 1–
4 cm, unequal; bracteoles oblong, whitish membranous, shorter than pedicels, 3-nerved; umbrellas 8–15-flowered. Fruit 1–3 × 1–1.5 mm; ribs scabridulous; vittae solitary in each furrow, 2 on commissure. Fl. and fr. Jun–Jul.

Arid semi-deserts, stony slopes. W Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan].


Culm 1–1.5 mm; ribs scabridulous; vittae solitary in each furrow, 2 on commissure. Fl. and fr. Jun–Jul.

1a. Petals glabrous; fruit glabrous, 2.5–3 × 1.5–2 mm; vittae 3–6 in each furrow .......................................................... 1.

1b. Petals ciliate or glabrous; fruit pilose, ca. 2 × 1 mm; vittae 1–2 in each furrow ....................................................... 2.

1. Nothosmyrnium japonicum

Plants 50–100 cm. Taproot stout. Basal leaves petiolate, petioles sheathing; blade 1–3-pinnate or ternate-1–2-pinnate. Cauleine leaves gradually reduced upwards, 1-pinnate or 3-lobed, smaller, sessile on expanded sheaths. Inflorescence branching; umbels compound, terminal and lateral; bracts and bracteoles present, entire, membranous; rays unequal; umbellules many-flowered; pedicels unequal. Calyx teeth obsolete. Petals white, oblong, broadly ovate or suborbate, base cuneate, apex scarcely incurved, outer petals slightly larger (radiant). Stylodium conic; styles reflexed. Fruit ovoid, slightly dorsally compressed, constricted at the commissure; dorsal and intermediate ribs filiform, lateral ribs obscure, surface glabrous or pilose; vittae 1–2 or 3–6 in each furrow, 2 or 4–8 on commissure. Seed face plane or slightly concave. Carpophore 2-cleft to the base.

- Two species: China; one species cultivated and adventive in Japan.

1a. Petals glabrous; fruit glabrous, 2.5–3 × 1.5–2 mm; vittae 3–6 in each furrow .......................................................... 1. N. japonicum

1b. Petals ciliate or glabrous; fruit pilose, ca. 2 × 1 mm; vittae 1–2 in each furrow ....................................................... 2. N. szechuenense

1. Nothosmyrnium japonicum

Macrochlaena Handel-Mazzetti.

Plants 50–100 cm. Taproot stout, bearing branched, fascicled-fibrous roots. Basal leaves petiolate; blade triangular-ovate or oblong-ovate, 10–20 × 8–15 cm, 1–2-pinnate or ternate-1–2-pinnate; primary pinnae 6 pairs; ultimate segments oblong-ovate, ovate or broadly ovate, 2–8 × 2–4 cm, abaxially pubescent, base cuneate, margins serrate or incised, apex acuminate. Umbels 6–12 cm across; peduncles 5–17 cm; bracts 3–4, conspicuous, yellowish, lanceolate or ovate-lanceolate, 15–35 × 4–7 mm, often reflexed, apex cuspidate; rays 7–15, 2–5 cm, unequal, spreading-ascending; bracteoles 2–5, conspicuous, yellowish, ovate or broadly ovate, 7–10 × 3–5 mm, equal to or slightly longer than flowers, enclosing umbellules in flower, then reflexed, apex cuspidate; pedicels 5–10 mm, unequal. Petals glabrous. Fruit 2.5–3 × 1.5–2 mm, glabrous; vittae 3–6 in each furrow, 4–8 on commissure. Fl. and fr. Aug–Oct.

- Montane forests, forest margins, grasslands; 500–2900 m. Anhui, Fujian, Gansu, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Yunnan, Zhejiang [cultivated and adventive in Japan].

1a. Ultimate leaf segments oblong-ovate, ovate or broadly ovate, margins serrate or incised ....................................................... 1a. var. japonicum

1b. Ultimate leaf segments lanceolate or ovate-lanceolate, margins irregularly laciniate ........................................................................... 1b. var. szechuenense

1a. Nothosmyrnium japonicum var. japonicum

Macrochlaena glaucocarpa Handel-Mazzetti.

Plants 50–120 cm. Ultimate leaf segments oblong-ovate, ovate or broadly ovate, margins serrate or incised.

- Forest margins, moist grasslands; 500–2900 m. Anhui, Fujian, Gansu, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Zhejiang [cultivated and adventive in Japan].

The taproot is used medically as a sedative and to relieve pain.

1b. Nothosmyrnium japonicum var. szechuenense


川白苞芹

Chuan bai bao qin

Plants 80–150 cm, stout. Ultimate leaf segments lanceolate or ovate-lanceolate, margins irregularly laciniate.

- Montane forests, grasslands; 900–2500 m. Gansu, Guangdong, Guangxi, Guizhou, Hubei, Jiangxi, Shaanxi, Sichuan, Yunnan.
This variety has reputed medicinal value (in Sichuan).


西藏白苞芹 xizang bai bao qin

Plants 30–60 cm, slender. Taproot 6–7 × 2–3 cm. Basal leaves petiolate, petioles 5–6 cm; blade oblong, 8–15 × 2–2.5 cm, 2–3-pinnate; primary pinnae 5–7 pairs; ultimate segments ovate-lanceolate or lanceolate, 1.5–2 × ca. 1 cm, margins irregularly laciniate. Umbels 3–5 cm across; peduncles 8–10 cm; bracts 5, oblong, 0.8–1 × ca. 0.3 cm, ciliate, apex cuspidate, usually reflexed; rays (8–)12–16, 1–3 cm, unequal; bracteoles 5, ovate, ca. 2.5 × 1 mm, ciliate or glabrous; pedicels 2.5–4 mm, pubescent. Petals ciliate. Fruit ca. 2 × 1 mm, pilose; vittae solitary or 2 in each furrow, 4 on commissure. Seed face plane.


● Coniferous forests, grassland at forest margins, streamsides, riparian weed communities; 3100–3400 m. SW Sichuan, SE Xizang.

1a. Basal leaves 2–3-pinnate; petals ciliate; vittae solitary in each furrow, 2 on commissure .......................................... 2a. var. xizangense

1b. Basal leaves 1–2-pinnate; petals glabrous; vittae 2 in each furrow, 4 on commissure ............................... 2b. var. simpliciorum

2a. Nothosmyrnium xizangense var. xizangense

西藏白苞芹(原变种) xizang bai bao qin (yuan bian zhong)

Basal leaves 2–3-pinnate. Petals broadly ovate or subcordate, ciliate, apex slightly reflexed or not. Vittae solitary in each furrow, 2 on commissure.

● Coniferous forests, streamsides; 3100–3200 m. SW Sichuan (Daoceng), SE Xizang (Mainling, Nangxian).

This variety has reputed medicinal value.


少裂西藏白苞芹 shao lie xi zang bai bao qin

Basal leaves 1–2-pinnate. Petals broadly ovate, glabrous, apex acute. Vittae 2 in each furrow, 4 on commissure.

● Grassland at forest margins, riparian weed communities; 3100–3400 m. SE Xizang (Mainling).

55. CARLESIA Dunn, Hooker's Icon. Pl. 28: t. 2739. 1902.

山茴香属 shan hui xiang shu

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs, perennial. Taproot stout, long-conic, usually digitate-branched. Stem erect, glabrous, branching, base densely clothed with fibrous remnant sheaths. Basal leaves numerous, petiolate; blade long-ovate to oblong, 3-pinnatisect; pinnae shortly petiolulate; ultimate segments linear, entire, margins narrowly reflexed, apex acute, both surfaces glabrous. Cauline leaves 2–3-pinnatisect. Umbels compound, terminal and lateral; bracts several, linear; rays numerous, spreading; bracteoles several, subulate to linear; pedicels short. Flowers white. Calyx teeth conspicuous, ovate-triangular. Petals oblong-ovate, apex narrowly reflexed, mid-rib conspicuous. Stylopodium conic; styles 2–3 × stylopodium, ca. equal to fruit. Fruit long-obovoid or ellipsoid-ovoid, slightly dorsally compressed, rough-puberulent; ribs obtuse; vittae 3 in each furrow, 4 on commissure. Seed face plane. Carpophore bifid at apex.

One species: China, Korea.


山茴香 shan hui xiang

Cuminum sinense (Dunn) M. Hiroe

Plants 10–30 cm. Taproot 8–15 mm thick. Basal petioles 2.5–8.5 cm; blade 2.5–7 × 1–3.5 cm: ultimate segments linear, 4–10 × ca. 1 cm. Upper leaves reduced, 3-parted. Umbels 1.8–4 cm across; peduncles 1.5–8 cm; bracteoles 5–8 × ca. 1 mm; rays 7–12(–20), 1–3 cm; bracteoles 2–5 mm; umbellules many-flowered; pedicels 2–3 mm. Calyx teeth 0.6–1 × 0.2–0.5 mm, abaxially pubescent. Fruit ca. 1.3 × 0.8 mm. Fl. and fr. Jul–Sep.

Dry mountain slopes, rock crevices; 300–1000 m. S Liaoning (Zhuanghe), NE Shandong (Muping, Weihai, Yantai) [Korea].

Specimens of this species from Korea are very similar but setulose hairy throughout. Further research is needed to establish the correct taxonomic position of the Korean plants.


[“Ciclospermum”], nom. et orth. cons.

细叶旱芹属 xi ye han qin shu

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs, annual, glabrous. Stem slender, much-branched, spreading to erect. Leaves petiolate, sheaths membranous; blade 3–4-pinnatisect; ultimate segments narrow, slender. Cauline leaves reduced upwards, petioles becoming wholly sheathing. Synflorescence of lax terminal or leaf-opposed, compound (rarely simple) umbels; peduncles short or abortive; bracts and bracteoles absent; rays few, slender, spreading-ascending; umbellules rather few-flowered. Calyx teeth obsolete. Petals white, greenish or pinkish, ovate, acute, apex not narrow and reflexed, mid-rib conspicuous. Stylopodium low-conic; styles short to almost obsolete. Fruit ovoid to globose, rounded at both ends or slightly narrow toward apex, slightly compressed laterally, somewhat constricted at commissure, glabrous; ribs rounded-obtuse, prominent, somewhat corky; vittae 1 in each furrow, 2 on commissure. Seed face plane. Carpophore
bifid at apex.

About three species: tropical and temperate America; one species a widely naturalized weed in tropical and temperate regions, including China.


细叶旱芹  xi ye han qin


Plants 25–45 cm. Basal petioles 2–5(–11) cm; blade oblong to oblong-ovate, 2–10 × 2–8 cm; ultimate segments linear to filiform. Cauline leaves ternate-pinnately decompound; ultimate segments 10–15 mm. Umbels 1.5–2.5 cm across; rays 2–3(–5), 1–2 cm; umbellules 5–23-flowered; pedicels 0.2–4 mm, unequal, the central flower often almost sessile. Fruit globose 1.5–2 × 1–2 mm. Fl. May–Jun, fr. Jun–Jul.

Streamsides, wastelands, ruderal areas. Fujian, Guangdong, Jiangsu, Taiwan [native to South America; widely naturalized as a weed in tropical and temperate regions].


天山泽芹属  tian shan ze qin shu

*Sium* erectum Hudson, Fl. Angl. 103. 1762; *Berula angustifolia* Mertens & W. D. J. Koch, nom. illeg. superfl.; *Siella erecta* (Hudson) Pimenov; *Sium angustifolium* Linnaeus, nom. illeg. superfl.

Plants 40–50(–100) cm. Stem hollow, branched, rooting at basal nodes. Submerged leaves 3–4-pinnate; ultimate segments linear. Aerial leaves 1-pinnate; pinnae 4–9(–15) pairs, basal pairs remote, sessile, ovate-lanceolate or oblong, 1.5–5(–7) × 0.8–2.5(–3) cm, base obliquely truncate, usually with 1 lobe at basal edge, margins serrate or irregularly incised. Upper leaves smaller, sheaths expanded. Umbels 4–6 cm across; bracts 3–6, oblong or lanceolate, 6–21 mm, entire or incised; rays 5–15 (–20), 2–3 cm, unequal; bracteoles 5–8, 1.5–5 mm, unequal, usually entire, nearly as long as or longer than the pedicels; umbellules 10–20-flowered; pedicels 2–5 mm. Fl. May–Jun, fr. Jul–Aug.

Streamsides, other riparian habitats on plains or hills; ca. 1500 m. Xinjiang [Afghanistan, NW India, Kashmir, Kazakhstan, Kyrgyzstan, W Nepal, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; N Africa, SW Asia, Europe; introduced in the Americas and Australia].


泽芹属  ze qin shu

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

Herbs perennial, aquatic or semi-aquatic, glabrous throughout. Roots fascicled, fusiform or fibrous. Stem suberect, usually stoloniferous. Aerial leaves 1-pinnate, submerged leaves more dissected. Umbels compound, usually opposite leaves; bracts and bracteoles several, oblong or lanceolate, margins membranous, usually reflexed. Calyx teeth subulate or triangular, caducous. Petals white, obovate, base short-attenuate, apex retuse with small inflexed lobule. Stylopodium conic; styles longer than the stylopodium, recurved. Fruit ovoid, subdidymous, slightly compressed laterally, glabrous; exocarp corky and slightly thickened; dorsal and intermediate ribs filiform, lateral ribs obscure; vittae numerous, small, forming a continuous band encircling the seed. Seed face plane. Carpophore 2-cleft to base.

About ten species: Africa, Asia, Europe, North America; five species (one endemic) in China.

1a. Calyx teeth lanceolate or minute (E, N, and NE China) ................................................................. 1. *S. suave*
1b. Calyx teeth minute or inconspicuous (SC and W China).

2a. Plants slender, 5–15 cm; rays 2–3 ........................................... 5. *S. frigidum*
2b. Plants stout, 30–90(–150) cm; rays (8–)10–20(–30).

泽芹 *ze qin*

*Apium cicutifolium* (Schrenk) Bentham & Hooker ex Forbes & Hemsley; *Cicuta dahurica* Fischer ex Schultz; *Sium cicutifolium* Schrenk; *S. formosanum* Hayata; *S. nipponicum* Maximowicz.

Plants 60–120 cm, stout. Root fibrous or fascicled, fusiform. Leaf blade oblong or ovate, 6–25 × 7–10 cm; pinnae 3–9 pairs; leaflets lanceolate or linear, 10–40 × 3–15 mm, margin serrate. Upper leaves smaller, 3-lobed or entire, sessile on expanded sheaths. Umbels 4–8 cm across, terminal on stem and branches; bracts 6–10, lanceolate or linear-lanceolate, 3–15 mm, entire or incised; umbellules 10–20-flowered; pedicels 2–5 mm. Calyx teeth minute, triangular, ca. 0.2 mm. Fruit ovoid, ca. 2.1 × 2.3 mm; ribs filiform, thinly corky; vittae 2–3 in each furrow, 2–6 on commissure. Fl. Jul–Aug, fr. Sep–Oct. 2n = 20.

Marshlands, stream banks; 400–500 m. Xinjiang [Kazakhstan, Russia; C Asia, Europe; introduced in Australia].


拟泽芹 *ni ze qin*

*Sisarum sissoroides* (de Candolle) Schischkin ex Krylov.

Plant 50–100 cm. Root fibrous. Stems erect with creeping underground shoots. Leaves 1-pinnate; leaflets 2–4 pairs, ovate-lanceolate, 2–7 × 1–3 cm, margins serrate-dentate. Upper leaves smaller, leaflets lanceolate. Umbels 3–5 cm across; peduncles elongate; bracts 2–6, linear-lanceolate, 3–5 mm, entire; rays 8–10 (–30), 1.5–2.5 cm, unequal; bracteoles several, similar to bracts, 5–6 mm; umbellules 15–25-flowered; pedicels 2–3 mm. Calyx teeth minute, ca. 2 mm. Styles ca. equal to stylopodium, reflexed. Fruit ellipsoid, ca. 3 × 2 mm; ribs filiform, thin-corky; vittae 3 in each furrow, 2–5 on commissure. Fl. Jul–Aug, fr. Sep–Oct. 2n = 20.

Forests, meadows, marshes, river banks, stream banks; 100–1300 m. Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan, C and SW Asia].


滇西泽芹 *dian xi ze qin*

*Chamaesium frigidum* (Handel-Mazzetti) R. H. Shan ex F. T. Pu.

Plants 5–15 cm, slender. Roots fusiform or tubers, rootstock 1–3 cm. Stem sometimes rooting at lower nodes. Leaf blade oblong or lanceolate, 1–4 × 0.5–1 cm, 1-pinnate; pinnae 3–5 pairs, remote, ovate-lanceolate, 2–8 × 0.4 mm, entire or 1–3-crenate. Upper leaves much reduced, pinnae 2–3 pairs, linear or reduced to bladeless sheaths. Umbels 1–2 cm across, terminal or lateral; peduncles 2–7 cm; bracts 1, linear-lanceolate, ca. 3 mm, or absent; rays 2–3, 5–10 mm, unequal; bracteoles 1–2, similar to bract, 0.5–1.5 mm, shorter than pedicels, or absent; umbellules 3–5 (–9)–flowered; pedicels 2–4 mm. Calyx teeth minute, triangular, ca. 0.2 mm. Fruit ovoid, ca. 2 × 2.5 mm. Fl. and fr. Jul–Aug.

Forests, marshes, marshes, river banks, stream banks; 600–1500 m. Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].


欧泽芹 *ou ze qin*

Plants 70–150 cm. Roots fibrous. Submerged leaves 2–3-pinnate; ultimate segments linear. Aerial leaves 1-pinnate; pinnae 2–6 pairs, leaflets lanceolate or oblong, 4–7 (–16) × 0.8–2 cm, margins serrate. Upper leaves reduced, smaller; leaflets linear-lanceolate or linear. Umbels 6–12 cm across; peduncles elongate; bracts 2–6, linear-lanceolate, 3–5 mm, entire; rays 8–10 (–30), 1.5–2.5 cm, unequal; bracteoles several, similar to bracts, 5–6 mm; umbellules 15–25-flowered; pedicels 2–3 mm. Calyx teeth minute, ca. 2 mm. Styles ca. equal to stylopodium, reflexed. Fruit ellipsoid, ca. 3 × 2 mm; ribs filiform, thin-corky; vittae 3 in each furrow, 2–5 on commissure. Fl. Jul–Aug, fr. Sep–Oct. 2n = 20.

Marshlands, stream banks; 400–500 m. Xinjiang [Kazakhstan, Russia; C Asia, Europe; introduced in Australia].

This rather little-known taxon is recorded only from a few collections. It was recently suggested that it is conspecific with *Apium ventricosum* H. de Boissieu (Bull. Soc. France, 53: 425. 1906), but the
generic placement of these taxa is still unclear.


岩风属 yan feng shu

She Menglan (佘孟兰 Sheh Meng-lan); Michael G. Pimenov, Eugene V. Kljuykov, Mark F. Watson

Herbs rarely subshrubs, perennial, stout, sometimes small, rarely acaulescent. Taproot conic, unbranched, caudex simple, rarely branched, woody. Stem often strongly angled and fluted, base densely clothed with fibrous leaf remains. Basal leaves 1–4-pinnate or 1–4-pinnatisect; ultimate segments linear, ovate or lanceolate, entire or lobed. Umbels compound, terminal and lateral; bracts few to numerous or absent; rays numerous to few; bracteoles several, linear or lanceolate. Calyx teeth conspicuous, linear, triangular or elliptic. Petals white, rarely pinkish, ovate or obcordate, apex narrow, inﬂexed. Stylopodium low-conic, margins often undulate at the base. Fruit ovoid or oblong, slightly to moderately dorsally compressed; dorsal ribs ﬁliform, low or prominent, acute-ridged, lateral ribs sometimes slightly broader; vittae 1–2(–3) in each furrow, 2–4 (rarely 6–8) on commissure. Seed face plane. Carpophore entire or 2-parted.

About 30 species: Asia, Europe; 18 species (eight endemic) in China.

The taxonomic position of Libanotis and related genera continues to be controversial. Since its establishment authors have either accepted it as an independent genus or regarded it as a subgenus or a section of Seseli. The conspicuous calyx teeth, well-developed bracts and bracteoles, and almost always pubescent fruit seem to distinguish it from Seseli, but more material is needed for a taxonomic study to resolve this complex situation. Among the present co-authors, Pimenov and Kljuykov favor a classiﬁcation where Eriocycla and Libanotis are included within an expanded, polymorphic Seseli, whereas She and Watson prefer to retain these as separate genera pending further research. As is usual in Flora of China, where there are differences of taxonomic opinion, the Chinese view is adopted for the Flora and a summary of the alternative classiﬁcation is provided, in this case at the end of the Seseli account.

1a. Plants acaulescent, 2–10 cm; leaves in rosette; fruit densely papillose-scaly.
   2a. Leaf sheaths broadly ovate; fruit vittae 2–3 in each furrow, 4–6 on commissure .................................................. 17. L. acaulis
   2b. Leaf sheaths narrowly lanceolate; fruit vittae solitary in each furrow, 2 on commissure ........................................ 18. L. depressa

1b. Plants caulescent, 10–130 cm; leaves not in rosette; fruit glabrous or variously hairy, not papillose-scaly.
   3a. Petals abaxially glabrous or sparsely pubescent; caudex short; stem strongly angled and ﬂuted; leaves papery, matt.
      4a. Stem hollow; bracteoles longer than umbellules ................................................................. 12. L. condensata
      4b. Stem rigid, solid; bracteoles shorter than umbellules.
   5a. Fruit vittae 3–4 in each furrow, 6–8 on commissure ......................................................... 13. L. seseloides
      5b. Fruit vittae solitary in each furrow, 2–4 on commissure.
      6a. Leaf blade narrowly elliptic, 3-pinnatisect, ultimate segments linear, 1–2 × 0.4–0.6 mm ................. 14. L. incana
      6b. Leaf blade oblong, 2-pinnatisect, ultimate segments ovate rhombic or linear, 8–15 × 1.2–7 mm.
   7a. Stem solitary; rays 35–50 .................................................. 15. L. sibirica
   7b. Stems usually several; rays 15–25 ............................................................... 16. L. schrenkiana

3b. Petals abaxially pubescent or villous; caudex stout, elongate and exposed; stem terete; leaves thick or coriaceous, shiny.
   8a. Rays 30–50; fruit ribs acute, prominent ................................................................. 1. L. buchtormensis
   8b. Rays 2–25; fruit ribs obtuse or rounded.
   9a. Stem suberect, branches very slender, diffusely spreading; rays 2–4 .................................................. 4. L. lanzhouensis
   9b. Stem erect, branches stout and ascending-spreadling; rays 4–25 (except L. laticalycina).
   10a. Leaf pinnules long-petiolulate.
      11a. Ultimate leaf segments narrow-lanceolate or elliptic-lanceolate, entire ........................................ 6. L. lancifolia
      11b. Ultimate leaf segments obovate, usually dentate or 2–3-lobed.
         12a. Rays 2–4, short, 1.5–4 mm ................................................................. 7. L. laticalycina
         12b. Rays 5–9, long, 15–30 mm ................................................................. 8. L. jinanensis
   10b. Leaf pinnules sessile or near so.
      13a. Ultimate leaf segments linear, entire ................................................................. 2. L. iliensis
      13b. Ultimate leaf segments linear-lanceolate or ovate, toothed or shallowly lobed.
   14a. Plants 40–90 cm, usually subshrubs.
      15a. Plants grayish pubescent throughout ................................................................. 5. L. spodotrichoma
      15b. Plants white pubescent throughout ................................................................. 3. L. wannienchun
   14b. Plants 10–40(–60) cm, entirely herbaceous.
      16a. Rays 4–8; fruit densely lanate with gray hairs .................................................. 9. L. eriocarpa
      16b. Rays 6–15; fruit densely hispid or shortly pubescent, not lanate.
         17a. Ultimate leaf segments linear-lanceolate, 1–5 × 0.5–1.5 mm; marginal fruit

「岩風」, yan feng

*Bubon buchtormensis* Fischer in Sprengel, Pl. Min. Cogn. Pug. 2: 55. 1815; *Libanotis cyclobova* Gillii; *Seseli buchtormense* (Fischer) W. D. J. Koch; *Seseli cyclolobum* (Gilli) Pimenov & Sdobnina; *Seseli giralddi* Diels.

Plants 20–80 cm. Taproot ca. 1.5 cm thick, caudex simple. Stem rigid, branched from base or above, strongly angled, flattened, glabrous. Petioles triangular-flattened in cross section, adaxially shallowly flushed; blade oblong-ovate or lanceolate, 5–12 × 2.5–7 cm, 2-pinnatisect, glabrous, pinnas sessile or very shortly petiolulate; ultimate segments ovate or obovate-cuneate, 5–30 × 3–15 mm, with 3–5 incised mucronate teeth, abaxially papillate; ultimate segments oblong to linear-lanceolate, 5–40 × 3–7 mm; marginal fruit ribs considerably larger than dorsal; vittae (1–)2–3 in each furrow, (2–)4–6 on commissure


伊犁岩风, yi li yan feng

*Seseli iliene* Lipsky in B. Fedtschenko, Pl. Turkestan. 616. 1915; *S. altissimum* Popov; *S. fedtschenkoanum* Regel & Schmalhausen var. *iliene* Regel & Schmalhausen; *S. vaillantii* H. de Boissieu.

Plants 100–200 cm. Taproot to 2 cm thick, caudex simple. Stem branched from base, solid, grooved, densely minutely pubescent, base 1–2 cm thick. Petioles densely pubescent, sheaths scarious-margined; blade triangular-ovate, 40–50 × 6–10 cm, 2–3-pinnatisect; ultimate segments linear, 10–40 × 0.5–1.1 cm, margins reflexed. Synflorescence paniculate; umbels 2–4 cm across; bracts 5–10, white, ovate-lanceolate, 3.5–5 × 1–1.2 mm, pubescent; rays 10–15–(20), 1–2 cm, slightly unequal, pubescent; bracteoles 5–10, ovate-lanceolate, 1.5–4–(15) × 0.6–0.7 mm, scarious-margined, abaxially densely pubescent; umbellules 10–20-flowered, subcapitate, flowers almost sessile. Calyx teeth short-triangular or subulate, 0.2–0.5 mm, pubescent. Petals white, abaxially pubescent. Fruit oblong or ellipsoid, slightly dorsally compressed, 2.8–4 × 0.6–0.7 mm, densely pubescent; ribs filiform; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Jun–Sep.

Stony mountain slopes, valleys; 1000–2100 m. Xinjiang (Ili, Urumqi) [Kazakhstan, Mongolia].

This species is used in Xinjiang as a regional substitute for the traditional Chinese medicine “fang feng” (*Saposhnikovia divaricata*).


万年春, wan nian chun

*Seseli wannienchun* (K. T. Fu) Pimenov.

Plants 60–80 cm, pubescent throughout. Caudex simple, stout, exposed. Stem solitary, erect, branched above, solid, finely grooved. Basal leaves numerous; petioles dilated, slightly flattened, 2–7 cm; blade narrowly oblong, 5.15–3.65 cm, 2-pinnate; leaflets 4–7 pairs, sessile or shortly petiolulate, 3-parted; lateral lobes oblong, 5–15 × 4–10 mm, 1–3 incised-toothed; terminal lobe obovate, base truncate, 3–5-lobe or dentate, abaxially reticulate and densely pubescent. Synflorescence cymose; umbels 2.5–4.5 cm across; peduncles stout, densely tomentose; bracts absent; rays 10–14, 0.5–2 cm, slightly unequal, densely villous; bracteoles 10–12, lanceolate, 2.5–3 mm, densely pubescent; umbellules 14–20-flowered; pedicels ca. 2.5 mm. Calyx teeth narrowly triangular or lanceolate-subulate, ca. 1.5 mm. Petals greenish-white, abaxially villous. Stylodium low-conic; styles short. Young fruit densely pubescent (mature fruit unknown). Fl. Aug.

・ Dry grassy slopes; 1200–1400 m. S Gansu (Chengxian, Huixian, Têwo).

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


兰州岩风, lan zhou yan feng


Plants 30–90 cm, herbaceous, densely pubescent throughout. Caudex simple. Stems several, suberect, branched from base, branches slender, spreading. Basal leaves numerous; blade oblong, 9.25–2–8 cm, 2–3-pinnately dissected; pinnae 4–7 pairs, pinnules 3 pairs; ultimate segments gray-green, linear or rhombic, 4–12 × 1.5–2 mm. Synflorescence paniculate; umbels 2–3 cm across; peduncles slender; bracts absent or occasionally 1 (like uppermost leaf); rays 2–4, 4–15 mm, slightly unequal; bracteoles 5–7, linear-lanceolate, 1.5–2 × ca. 1 mm; umbellules 5–10-flowered. Calyx teeth subulate, 0.6–1 mm. Petals white, abaxially puberulous. Stylodium conic, base margin dilated, undulate. Fruit ellipsoid, flattened laterally, 2.8–3.2

This species has reputed medicinal value.


This species has reputed medicinal value.


This species is used in Shanxi as a regional substitute, known as “shui fang fen,” for the traditional Chinese medicine “fang fen” (*Saposhnikovia divaricata*).


This species has reputed medicinal value.

solid, finely grooved, glabrous. Leaf blade gray-green, oblong, 6–14 × 2–5 cm, 2-pinnate; pinnae shortly petiolulate; ultimate segments linear, 5–20 × 1–3 mm, margins narrowly revolute. Cauline leaves reduced, 3-lobed or undivided. Synflorescence paniculate; umbels 1–2–(3.5) cm across; bracts (2–)4–7, lanceolate or ovate, short, unequal, abaxially pubescent, margins scarious, bases fused together; rays (2–)4–8, 5–10 mm, densely pubescent; bracteoles 5–8, lanceolate, 0.3–1.5 mm, connate at base; umbellules 10–20-flowered, subcapitate, flowers sessile. Calyx teeth lanceolate. Petals white, abaxially pubescent. Stylopodium low-conic; styles 2–3 × stylopodium, reflexed. Fruit ovoid or ellipsoid, dorsally compressed, 4.8–5.5 × 2.7–4 mm, shortly hairy; ribs unequal, dorsal ribs keeled, acute, marginal ribs shortly winged; vittae (1–)2–3 in each furrow, (2–)4–6 on commissure. Fl. and fr. Jul–Aug.

Mountain summits, dry stony and gravelly slopes, rock crevices; ca. 1600 m. Xinjiang [Kazakhstan, Mongolia].

Plants 20–90 cm. Caudex branched. Stem solitary, rigid, branching from the middle, solid, acute-ridged, deeply fluted, blade lanceolate to oblong, 10–20 × 3–6 cm, 1–2-pinnate, glabrous; pinnae sessile or shortly petiolulate; ultimate segments oblong to linear-lanceolate, 5–40 × 3–7 mm, acute. Upper leaves entire, rarely pinnate. Synflorescence paniculate; umbels 3–4 cm across; bracts 8–10, linear-lanceolate, herbaceous, puberulent; rays 6–10(–14), equal, puberulent; bracteoles 8–10, similar to bracts; umbellules 10–15-flowered. Calyx teeth lanceolate-triangular. Petals white, abaxially pubescent. Stylopodium low-conic; styles 2–3 × stylopodium, reflexed. Fruit ovoid or ellipsoid, dorsally compressed, 4.8–5.5 × 2.7–4 mm, shortly hairy; ribs unequal, dorsal ribs keeled, acute, marginal ribs shortly winged; vittae (1–)2–3 in each furrow, (2–)4–6 on commissure. Fl. and fr. Jul–Aug.

Schistose or limestone slopes, rock crevices; 1600–2400 m. Xinjiang [Mongolia].


密花岩风

*Athamanta condensata* Linnaeus, Sp. Pl. 2: 1195. 1753; *Libanotis laserpitifolia* (Palibin) K. T. Fu; *L. vulgaris* de Candolle var. condensata (Linnaeus) de Candolle; *Pachypleurum condensatum* (Linnaeus) Korovin; *Peucedanum condensatum* (Linnaeus) Koso-Poljansky; *Seseli condensatum* (Linnaeus) H. G. Reichenbach; *S. laserpitifolium* Palibin.

Plants 20–90 cm. Caudex branched. Stem solitary, branched above or simple, hollow, glabrous, angled and fluted. Leaf blade oblong, 6–30 × 2–10 cm, 2–3-pinnatisect; ultimate segments linear, 2–15 × 1–2 mm, hirsute on both surfaces along rachis and veins, margins hirsutulous, apex acuminate or acute. Synflorescence corymbose; umbels terminal, 3–7 cm across; peduncle apex densely hirsute; bracts 6–10, linear, ca. 1.5 cm, scarious-margined, pubescent; rays 15–25, ca. 2 cm, subequal, stout; bracteoles several, linear, exceeding flowers, villous; umbellules 15–20-flowered; pedicels ca. 4 mm. Calyx teeth subulate, 0.2–0.4 mm, pubescent. Petals white, glabrous or abaxially pubescent. Stylopodium dark purple, conic. Fruit ellipsoid, moderately dorsally compressed, 3–4 × 2–3 mm, densely villous; vittae 2–4 in each furrow, 4 on commissure. Fl. and fr. Jul–Sep.

Forest margins, grassy places, stream sides; 1400–2000 m. Hebei, Nei Mongol, N Shanxi (Ningwu), N Xinjiang (Altay) [Kazakhstan, Mongolia, S and SE Russia].

This species has reputed medicinal value (in Shanxi).


香芹


Plants 30–130 cm. Caudex simple. Stem solitary, rigid, branching from the middle, solid, acute-ridged, deeply fluted,
nodes ovate, rhombic or lanceolate, 15–30 × 6–15 mm, 3–5-cm, pinnate to 2-pinnately parted; pinnae 8–9 pairs, sessile; pinlowly grooved; blade ovate-oblong in outline, 15–40 × 5–10 mm, petioles shorter than blade, dis tal leaf rachis shallowly grooved; blade ovate-oblong in outline, 15–40 × 5–10 mm, petioles 1–5.5 mm. Calyx teeth triangular-lanceolate, ca. 0.5 mm, pubescent. Petals white, abaxially puberulent. Fruit oblong-ovoid, slightly dorsally compressed, 2.5–3.5 × ca. 1.5 mm; lateral ribs slightly broader than the dorsal; vittae 3–4 in each furrow, 6 on commissure. Fl. and fr. Jul–Aug.

Forest margins, among shrubs, open grassy places; 1000–1400 m.

This species is used in Gansu and Shaanxi as a regional substitute for the traditional Chinese medicine “fang feng” (Saposhnikovia divaricata).


坚挺岩风 jian ting yan feng

Seseli schrenkianum (C. A. Meyer ex Schischkin) Pimenov & Sdobnina.

Plants 40–110(–130) cm. Caudex branched. Stems usually several, or solitary, erect, branched above, solid, finely ribbed, scattered puberulent. Basal leaves with long petioles, rachis shallowly grooved; blade oblong-ovate, 10–40 × 6–12 cm, 3-pinnatisect; pinnae 5–7 pairs, sessile; ultimate segments linear-lanceolate, 3–10 × 1–3 mm, sometimes ovate-rhombic, ca. 15 × 7 mm, 1–3-serrate, margins narrowly revolute, both surfaces glaucous and sparsely puberulent. Umbels (3–)5–10 cm across; peduncles stout, elongate, apex pubescent; bracts absent or 3–9, subulate to linear, 1–5 mm; rays 15–25(–40), 1–4 cm, almost equal; bracteoles 10–12, linear, 2–6 × ca. 1 mm, shorter than flowers, puberulous; umbellules many-flowered; pedicels 1.5–6(–9) mm. Calyx teeth triangular-lanceolate, ca. 0.5 mm. Petals white, glabrous. Fruit ellipsoid, slightly dorsally compressed, 2.5–3.5 × 0.7–2 mm, densely pubescent when young, becoming sparsely puberulous; ribs subequal, shortly keeled; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Aug–Sep.

Among shrubs, grassy slopes, gravelly soils, roadsides; 1700–2600 m. NW Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].


阔叶岩风 kuo qiao yan feng

Plants 4–8 cm, caulescent, dwarf, rosette, often diffuse. Taproot undivided. Leaf sheath broadly ovate, margin scarios and pubescent; leaf rachis broad, shallowly grooved; blade oblong, 1–3 × 0.7–1.2 cm, 2-pinnatisect; pinnae 4 pairs; ultimate segments linear-elliptic, 2–3 × 0.8–1 mm, apex apiculate, 2-furcate, glabrous. Upper leaves sessile, sheaths broadly lanceolate, clasping, blade small, 3-lobed. Terminal umbel to 7.5 cm across, sessile, appearing as a group of simple umbels; lateral umbels 0.7–2 cm across, peduncles 0.5–1 cm; rays 7–10, 0.8–1 cm; bracts 1–2; bracteoles 10–20, lanceolate, 3–6 × 0.5–1 cm.
mm, unequal; umbellules 15–20-flowered; pedicels 2.5–3 mm. Calyx teeth triangular-lanceolate, ca. 0.8 × 0.5 mm. Petals white, glabrous. Fruit oblong, slightly dorsally compressed, 2–2.5 × 1.5–1.8 mm, gray-brown, densely scaly-tomentose; vittae 2–3 in each furrow, 4–6 on commissure. Fl. and fr. Jul–Aug.

- Dry grassy places; 2300–2600 m. C Xinjiang (Heijing).

This rather poorly known species is recorded only from a few localities.


地岩风, *di yan feng*

Plants 2–5 cm, dwarf, acaulescent, rosette. Taproot 2–6 × 0.8–1.2 cm, undivided. Petioles 0.5–3.5 cm, sheaths narrowly lanceolate; blade oblong, 2.5 × 0.5–1.8 cm, 2-pinnatisect; pinnae 2–4 pairs; ultimate segments linear-lanceolate, 0.3–1 × 0.5–1 mm, base and margins pilose, apex apiculate, glabrous or minutely puberulent. Terminal umbel 4–9 cm across, sessile, appearing as a group of simple umbels, lateral umbels few, smaller, on long peduncles, stout, puberulent; bracts 1–2, usually obscured by leaf rosette; rays 6–10, 1–6 cm, densely puberulent; bracteoles 7–11, acicular, 3–9 mm, very unequal, the largest longer than flowers; umbellules 10–20-flowered; pedicels 1–4 mm, pubescent. Calyx teeth lanceolate, very conspicuous, ca. 1 × 0.4 mm, sometimes ca. 0.5 × fruit. Petals white, costa yellowish, glabrous. Styles 2–3 × stylopodium, reflexed. Fruit oblong or suborbicular, slightly dorsally compressed, 2.5 × 1.3–1.5 mm, densely scaly-hispid; ribs filiform, prominent; vittae large, 1 in each furrow, 2 on commissure. Fl. and fr. Jul–Sep.

- Grassy places, river banks; 3400–4100 m. S Qinghai (Yushu), NW Sichuan (Dêgê), E Xizang (Gonjo).

This and the previous species have an unusual fruit ornamentation similar to that seen in *Stenocelium*. These two species are part of a group of dwarf, high-altitude Himalayan rosette-forming umbellifers that are not easy to identify; see also *Cortia, Cortiella, Pleurospermum hedlinii*, etc.

### 60. SESELI Linnaeus, Sp. Pl. 1: 259. 1753.

**西风芹属**, *xi feng qin shu*

She Menglan (佘孟兰, She Meng-lan); Michael G. Pimenov, Eugene V. Kljuykov, Mark F. Watson

Herbaceous, perennials, sometimes woody at base. Taproot conic, caudex woody, undivided or branched. Stem terete, rarely hollow. Leaf blade 1–3-pinnate or pinnately decompound, rarely ternately dissected or simple and undivided. Umbels compound; bracts few to many; rays few to many; bracteoles few to many, lanceolate or linear, bases often connate, scarios or scarios-margined; umbellules few to many-flowered; pedicels short or long, occasionally subsessile. Calyx teeth obsolete or minute. Petals white or yellow, suborbicular or oblong, emarginate, apex broadly or narrowly inflexed, abaxially often pubescent or hisurate. Stylopodium conic or depressed. Fruit ovoid or ellipsoid, moderately or slightly dorsally compressed, glabrous or variously hairy; ribs prominent, rounded or keeled, subequal, marginal ribs sometimes narrowly winged; vittae 1–2(–4) in each furrow, 2 (rarely 4–8) on commissure. Seed face plane. Carpophore 2-cleft to base.

About 80 species: Asia, Europe; 19 species (nine endemic) in China.

See the taxonomic comments under *Eriocycla* and *Libanotis*, and the alternative classification at the end of the *Seseli* account.

1a. Fruit vittae solitary in each furrow, 2 on the commissure.

2a. Caudex branched at apex, stems several.

3a. Bracteoles glabrous; fruit papillose-pubescent; rays (2–)6–10.

4a. Fruit with a white and membranous disk at base ........................................... 1. *S. glabratum*

4b. Fruit without a white and membranous disk at base .................................... 2. *S. intramongolicum*

3b. Bracteoles puberulous; fruit pubescent or hisurate, but never papillose; rays 2–6(–10).

5a. Umbels 1–2.5 cm across; bracteole bases connate .................................... 3. *S. aemulans*

5b. Umbels 2–6 cm across; bracteole bases free.

6a. Ultimate leaf segments 15–40(–80) × 0.7–1.5 mm; rays 3–4; flowers almost sessile ................. 14. *S. togasii*

6b. Ultimate leaf segments 5–7 × 1–2 mm; rays 6–8(–10); flowers pedicellate .................. 15. *S. junatovii*

2b. Caudex undivided; stem solitary.

7a. Stem hollow ........................................................................................................ 4. *S. nortonii*

7b. Stem solid, with pith.

8a. Plants densely white hispidulous; leaf blade 3-parted, not pinnate, ultimate segments 70–130 × 5–10 mm ......................................................................................... 7. *S. delavayi*

8b. Plants puberulent to almost glabrous; leaf blade 2–3-pinnate, ultimate segments 3–50 × 0.5–2 mm.

9a. Fruit oblong, 5–6.5 × 2–3 mm ................................................................................. 5. *S. eriocephalum*

9b. Fruit ovoid, 2–4 × 0.8–1.5 mm.

10a. Ultimate leaf segments 5–12 × 0.5–1 mm; ribs slightly prominent, rounded ............. 6. *S. valentinae*

10b. Ultimate leaf segments 20–50 × 0.5–2 mm; ribs prominent, keeled ......................... 13. *S. strictum*
1b. Fruit vittae 2–5 in each furrow, 4–10 on the commissure.

11a. Bracteoles fused to each other at base, sometimes, up to middle.

12a. Leaf blade 2–4-ternately dissected, ultimate segments narrow-linear 7–65 × 0.5–3 mm .... 8. S. yunnanense

12b. Leaf blade trifoliolate or 2-ternately dissected, ultimate segments elliptic or lanceolate, 20–120 × 2–12 mm .... 9. S. mairei

11b. Bracteoles not fused at base.

13a. Caudex branched.

14a. Flowers sessile, umbellules capitate

14b. Flowers pedicellate, umbels loose, not capitate.

15a. Leaf blade greenish pubescent; stems, rays and bracts scabrous; bracteoles 5–8; fruit minutely pubescent .................................................. 16. S. asperulum

15b. Plant completely glabrous; bracteoles 8–10; fruit glabrous ........................................ 17. S. coronatum

13b. Caudex unbranched.

16a. Stylopodium conic.

17a. Pedicels stout, 2–4 mm; leaf sheaths dark purple .......................................................... 11. S. purpureovaginatum

17b. Pedicels slender, short 0.5–1.5 mm; leaf sheaths green .................................................. 12. S. squarrosum

16b. Stylopodium low-conic.

18a. Fruit ovoid, apex narrow, densely pubescent; leaf blade 2-pinnate, ultimate segments ovate or rhombic ............................................................. 18. S. sandbergiae

18b. Fruit oblong glabrous; leaf blade 3-pinnate, ultimate segments ovate ................................ 19. S. incisodontatum


膜盘西风芹  mo pan xi feng qin

Seseli tenuifolium Ledebour.

Plants 25–50 cm. Caudex branched. Stems several, much-branched from base or middle, solid, rigid, finely grooved, glabrous. Leaf blade broadly ovate, 7–10 × 3–5 cm, 2-pinnatisect; ultimate segments linear, 20–40(–80) × 0.5–1(–1.5) mm, glabrous, margins revolute. Synflorescence paniculate; umbels 2–4 cm across; bracts absent or 1–2, subulate, 1–3 × 0.5–1 mm; rays 6–10, 0.6–2(–2.5) cm, subequal, glabrous; bracteoles 6–8, lanceolate or linear-subulate, shorter than flowers, usually reflexed, glabrous, margin scarious; umbellules 8–15-flowered; pedicels 2–5 mm. Calyx teeth obsolete. Petals white, costa yellow, emarginate, glabrous. Ovary and fruit with a white, membranous disk at base, disk 0.6–1 mm across, persistent. Stylodium conic; styles reflexed. Fruit ellipsoid or narrowly ovoid, dorsally compressed, 2.7–4.5 × 0.9–1.3 mm, finely papillose or slightly scabrous, sometimes subglabrous; ribs equal, prominent, filiform or shortly keeled; vittae 1 in each furrow, 2 on commissure. Fl. Jun–Jul, fr. Aug–Sep.

Grasslands, steppes, dry stony and clayey slopes, sometimes sandy areas; 1000–1500 m. N Xinjiang (Altay) [Kazakhstan, Mongolia, Uzbekistan].


内蒙西风芹  nei meng xi feng qin

Plants 25–60 cm. Caudex branched. Stems several, dichotomously much-branched from base or middle, solid, terete, glabrous or minutely scabrid at base. Basal leaves numerous, long-petiolate; blade oblong or oblong-ovate, 2–20 × 2–7 cm, 2-pinnatisect; ultimate segments linear, 3–15 × 0.5–2 mm, glabrous, margins revolute, apex apiculate. Synflorescence thyroid, much-branched; umbels (1–)3–6 cm across; bracts absent; rays (2–)8–10, 0.3–1.2 cm, subequal, ridged, minutely puberulous; bracteoles 7–10, ovate-lanceolate, shorter than flowers, fused to each other at least at base, glabrous or minutely puberulent, reflexed; umbellules 7–15-flowered; pedicels 1.5–3 mm. Calyx teeth obsolete. Petals white, occasionally yellowish, costa fulvous, abaxially puberulous. Stylodium conic, base undulate; styles reflexed. Fruit oblong, dorsally compressed, (3–)4–6 × (1.5–)2.5–3.5 mm, densely papillose-pubescent when young, glabrescent when mature; ribs filiform, prominent; vittae 1 in each furrow, 2 on commissure. Fl. Jul–Aug, fr. Aug–Sep.

● Mountain slopes, dry stony places; 1500–2200 m. Gansu (Hegang Shan), SW Nei Mongol (Ih Ju Meng, Zhuozi Shan), N Ningxia (Helan Shan).


大果西风芹 da guo xi feng qin

Plants 40–50 cm, polycarpic. Caudex branched. Stems several, dichotomously branched from base or above, solid, finely grooved, glabrous. Basal leaves numerous, petiolate; blade ovate-oblong or oblong, 4–10 × 2–4.5 cm, 2-pinnatisect; pinnate short-petiolulate; ultimate segments linear-filiform, 5–25 × 0.5–1.1 mm, glabrous, margins revolute, apex apiculate. Cauline leaves few, reduced above becoming subsessile, blade 3-parted, segments linear, elongate. Synflorescence paniculate, much-branched; umbels 1–2.5 cm across; bracts absent or 1–5, ovate, minute, margin scarious; rays 2–6, 4–14 mm, unequal, spreading, squarrose; bracteoles 6–10, ovate, triangular-lanceolate or lanceolate-subulate, ca. 2 × 0.5–1 mm, connate at base for half their length, abaxially puberulous; umbellules 6–12-flowered; pedicels 1.5–3 mm. Calyx teeth obsolete. Petals white or pale yellow, costa yellow-brown, abaxially pubescent. Stylodium conic; styles reflexed. Fruit ovoid or ellipsoid, apex narrow, dorsally compressed, 6–7(–10) × 3–4(–6) mm, puberulous or sparsely pilose; vittae 1 in each furrow, 2 on commissure. Fl. Aug, fr. Sep.

Dry or gravelly slopes, dry pebbly stream beds; ca. 1000 m. Xining (Tian Shan) [Kazakhstan].

西藏西风芹 xi zang xi feng qin

Plants 30–50 cm. Caudex simple. Stem solitary, hollow, tawny or purplish, shiny, hispidulous, much-branched above. Basal leaves many, petiole sheaths broadly ovate, hispidulous, scarious-margined; blade broadly rhombic, 2-pinnate; ultimate segments ovate, 10–15 × 6–11 mm, 3-lobed, parted or sub-pinnate, serratte, white hispis on both surfaces and leaf-rachis, especially margins and veins abaxially. Umbels 8–12 cm across; bracts 5–7, lanceolate, shorter than rays, densely white-hispid; rays ca. 10, 3.5–6 cm, unequal; bracteoles numerous, similar to bracts; umbellules many-flowered; pedicels 1.5–5(–7) mm. Calyx teeth subulate, ca. 0.1 mm. Petals white, costa deep yellow, abaxially white-hispid; bracteoles 12–15, ovate-lanceolate, ca. 2.5 × 0.5 mm, about 2 × ca. 2 mm, bases connate to the middle, abaxially puberulent. Synflorescence paniculate; umbels 20–25-flowered, densely white pubescent, margins scarious; umbellules 20–25-flowered, capitate; pedicels very short, 1–2 mm, pubescent. Petals yellowish, abaxially white puberulous. Stylodium low-conic; styles reflexed. Fruit ovoid or oblong-ovoid, slightly dorsally compressed, 2.2–4 × 0.8–1.5 mm, densely puberulent; ribs prominent, equal, obtuse-keeled; vittea 1 in each furrow, 2 on commissure. Fl. Jul–Aug, fr. Aug–Sep.


毛序西风芹 mao xu xi feng qin

Bubon eriocephalus Pallas ex Sprengel, Syst. Veg. 1: 900. 1824.

Plants 40–80 cm, monocarpic. Caudex simple, 1–2 cm thick. Stem solitary, much-branched from middle, solid, finely grooved, minutely puberulent or almost glabrous. Basal leaves numerous, long-petiolate; blade triangular-ovate, 6–10 × 5–8 cm, 3-pinnate; pinnae petiolulate; ultimate segments lanceolate or linear, 3–10 × 1–2 mm, margins entire, narrowly revolute, apex mucronate. Synflorescence paniculate; umbels 2–5 cm across; bracts absent; rays 2–10(-15), 0.5–2 cm, slightly unequal, scabrous-pubescent; bracteoles 12–15, ovate-lanceolate, 2–3 × ca. 2 mm, bases connate to the middle, abaxially villous; umbellules 22–30(-40)-flowered, densely capitulate, flowers sessile. Calyx teeth obsolete. Petals white, abaxially puberulous. Stylodium depressed; styles slightly elongate, divergent. Fruit oblong, slightly dorsally compressed, 5–6.5 × 2–3.5 mm, densely tomentose; dorsal ribs thick, acute, prominent, lateral ribs slightly broader than dorsal; vittea 1 in each furrow, 2 on commissure. Fl. and fr. Jun–Aug.

● River banks, among stones; ca. 4000 m. Xizang (Kadah He).

This poorly known taxon is recorded only from the type. The subulate calyx teeth are atypical in the current circumscription of Seseli, and two of us (Pimenov and Kljuykov) consider this species should be included within Eriocyla nuda.


蔦序西风芹 cha zhi xi feng qin

Plants 50–90 cm, monocarpic, densely white hispidulous throughout. Caudex simple. Stem solitary, branched from middle, terete. Basal leaves several, petioles 10–16 cm; blade ternate-orbitate, 4–13 × 2–6 cm; leaflets sessile, linear-lanceolate, (40-) 70–130 × 5–10 mm, primary venation parallel, usually white hispis on both surfaces, especially margins and abaxially veins. Cauline leaves few, reduced upwards, leaflets 30–50 × 2–4 mm. Synflorescence corymbose; umbels 1–3(-4) cm across; peduncules elongate, hispidulous; bracts 5–7, linear, ca. 10 × 0.5 mm, bases free, apex cAudate; rays 6–8, 5–20 mm, subequal, densely white-hispid; bracteoles 5–7, linear, 6–8 mm, more than 2 × pedicels; umbellules 10–18-flowered; pedicels ca. 4 mm. Petals yellow, obovate, abaxially white-pubescent. Fruit ovoid or short ovoid, slightly dorsally compressed, ca. 3 × 2 mm, densely white hispid; ribs rounded, equal, broad and indumentum; vittea 1 in each furrow, 2 on commissure. Fl. Aug–Sep, fr. Sep–Oct.

● Alpine meadows, limestone slopes; 1500–3000(–4500) m. NW Yunnan (Binchuan, Heqin).

This species has reputed medicinal value.


松叶西风芹 song ye xi feng qin

Plants 30–80 cm, monocarpic. Caudex simple. Stem solitary, branching above, solid, terete, finely grooved, glabrous. Basal leaves numerous, petiolate; blade triangular or rhombic, 3–10 × 3–10 cm, 2–4-ternately dissected, every divided point articulated; ultimate segments narrowly linear, 7–65 × 0.5–3 mm, entire. Cauline leaves few, 1–3-ternately dissected; uppermost leaf 3-parted or simple. Synflorescence dichotomously branched, corymbose; umbels 2–4 cm across; bracts absent or occasionally 1, subulate, 1.5–4 mm; rays 6–10, 0.3–2(-4) cm, unequal; bracteoles 8–10, lanceolate, ca. 2.5 × 0.5 mm, about equaling flowers, bases connate, margin scarious; umbellules 15–30-flowered; pedicels ca. 2 mm. Calyx teeth obsolete. Petals grooved, lower parts minutely puberulent, branches elongate. Basal leaves several, petioles short; blade oblong, 5–10 × 2.5–3 cm, 2–3-pinnatisect; pinnae 4 pairs, remote; ultimate segments narrowly linear, 5–12 × 0.5–1 mm, glabrous, margins entire and revolute. Synflorescence corymbose; umbels 3–10 cm across; bracts absent; rays 6–13, 1–70 mm, very unequal; bracteoles 10–12, linear-lanceolate, about equaling flowers, bases connate, densely white pubescent, margins scarious; umbellules 20–25-flowered, capit; pedicels very short, 1–2 mm, pubescent. Petals yellowish, abaxially white puberulous. Stylodium low-conic; styles reflexed. Fruit ovoid or oblong-ovoid, slightly dorsally compressed, 2.2–4 × 0.8–1.5 mm, densely puberulent; ribs prominent, equal, obtuse-keeled; vittea 1 in each furrow, 2 on commissure. Fl. Jul–Aug, fr. Aug–Sep.

Stony mountain slopes, semi-deserts, conglomerate terraces, clayey soils; 1500–2300 m. Xingjiang (Bogda Shan, Zhaosu) [Kazakhstan, Kyrgyzstan].

8. Seseli siamicum Craib.

Plants 30–60(–70) cm, monocarpic. Caudex simple. Stem solitary, dichotomously branched nearly from base, finely grooved, lower parts minutely puberulent, branches elongate. Basal leaves several, petioles short; blade oblong, 5–10 × 2.5–3 cm, 2–3-pinnatisect; pinnae 4 pairs, remote; ultimate segments narrowly linear, 5–12 × 0.5–1 mm, glabrous, margins entire and revolute. Synflorescence corymbose; umbels 3–10 cm across; bracts absent; rays 6–13, 1–70 mm, very unequal; bracteoles 10–12, linear-lanceolate, about equaling flowers, bases connate, densely white pubescent, margins scarious; umbellules 20–25-flowered, capit; pedicels very short, 1–2 mm, pubescent. Petals yellowish, abaxially white puberulous. Stylodium low-conic; styles reflexed. Fruit ovoid or oblong-ovoid, slightly dorsally compressed, 2.2–4 × 0.8–1.5 mm, densely puberulent; ribs prominent, equal, obtuse-keeled; vittea 1 in each furrow, 2 on commissure. Fl. Jul–Aug, fr. Aug–Sep.

Stony mountain slopes, semi-deserts, conglomerate terraces, clayey soils; 1500–2300 m. Xingjiang (Bogda Shan, Zhaosu) [Kazakhstan, Kyrgyzstan].

This species has reputed medicinal value.
pale yellow, oblong or almost square, veins 3–5, brown-yellow, conspicuous, abaxially puberulent. Stylodium low-conic; styles short, stout. Fruit ovoid or oblong-ovoid, compressed dorsally, ca. $3 \times 1$ mm, glabrous; ribs ca. equal, narrowly keeled or rounded; vittae 1–2 in each furrow, 2–4 on commissure. Fl. and fr. Aug–Oct.

Coniferous forests, among shrubs, valleys; 600–3100 m. S Sichuan (Dechang, Leibo), NW Yunnan (Binchuan, Dali, Heqing) [Thailand].

The roots are used in Yunnan as a regional substitute, known as “song ye fang feng,” for the traditional Chinese medicine “fang feng” (Saposhnikovia divaricata).


竹叶西风芹 zhuo ye xi feng qin

Plants 15–80 cm, glabrous throughout. Caudex simple. Stem solitary, branched above, solid, terete, finely grooved. Basal leaves few to many, petiolate; blade triangular, 3–10 × 1–10 cm, trifoliolate or 2-ternately dissected; ultimate segments elliptic, lanceolate or linear-lanceolate, 20–120 × 2–12(–40) mm, subsessile, margins entire, narrowly revolute, with 3–10 parallel venations. Upper leaves usually linear and undivided. Synflorescence corymbose; umbels 12–18-flowered; pedicels 1.5–3 mm. Calyx teeth obsolete. Petals yellowish, square or oblong, with 3 veins, brown-yellow, oblong or almost square, veins 3–5, brown-yellow, conspicuous, abaxially puberulent. Stylodium low-conic; styles short. Fruit pale yellow, oblong or almost square, veins 3–5, brown-yellow, conspicuous, abaxially puberulent. Stylodium low-conic; styles short, stout. Fruit ovoid or oblong-ovoid, compressed dorsally, ca. $3 \times 1$ mm, glabrous; ribs ca. equal, narrowly keeled or rounded; vittae 1–2 in each furrow, 2–4 on commissure. Fl. and fr. Aug–Oct.

Both varieties have reputed medicinal value.

1a. Basal leaf blade 1–2-ternately dissected ...... 9a. var. mairei
1b. Basal leaf blade simple .................. 9b. var. simplicifolium

9a. Seseli mairei var. mairei

竹叶西风芹 (原变种) zhuo ye xi feng qin (yuan bian zhong)

Peucedanum bupleuriforme H. Wolff; P. bupleuroides H. Wolff.

Leaf blade trifoliolate or 2-ternately dissected.

Open woodlands, sunny mountain slopes, grassy places; 1200–3200 m. NW Guangxi, SW Guizhou, NW Sichuan, Yunnan [N Thailand].


Read the text in the image.
oblong, cross section rounded-pentagonal, 3.5–5 × 2–3 mm, glabrous; ribs prominent; ribs equal, shortly keeled; vittae 2–3 in each furrow, 4 on commissure. Fl. and fr. Jul–Sep.

- Sunny mountain slopes; ca. 3800 m. E Xizang (Biru).


绒果西风芹 cu cao xi feng qin

Plants 30–100 cm, monopartite. Caudex simple. Stem solitary, much-branched above, solid, terete, finely grooved, glabrous. Basal leaves many, petiolate; blade oblong or ovate-oblong, 5–14 × 2–4 cm, 3-pinnately dissected, leaf rachis shallowly grooved, squarrose; ultimate segments linear, 3–10 × 0.5–1.5 mm, abaxially slightly glaucous and sparsely squarrose, apex acute. Synflorescence much-branched, corymbose; umbels 1–5 cm across; bracts absent or 1–2, small; rays (4–)6–10, 1.5–3.5 cm, unequal, ridged, squarrose; bracteoles 5–6, lanceolate, shorter than or equaling flowers; umbellules 10–15-flowered; pedicels 0.5–2 mm. Petals yellow, subsquare or elliptic, costa deep yellow, sometimes abaxially puberulous. Fruit ellipsoid, slightly dorsally compressed, ca. 3.5 × 2 mm, puberulous when young; vittae 3–4 in each furrow, 6–10 on commissure. Fl. and fr. Jul–Sep.

- Sunny mountain slopes, dry valleys, grasslands; 1400–3600 m. E Qinghai (Datong, Menyuan, Tongren), W Sichuan.

The roots are used in Sichuan as a regional substitute, known as “chuan fang feng,” for the traditional Chinese medicine “fang feng” (Saposhnikovia divaricata). This taxon is possibly conspecific with Seseli incisodontatum.


劲直西风芹 jin zhi xi feng qin

Ammi ehrenbergii (H. Wolff) M. Hiroe; Athamanta stricta (Ledebour) Ledebour ex Steudel; Pseuammi ehrenbergii H. Wolff.

Plants 30–70 cm, monopartite. Caudex simple, 4–7 mm thick. Stem solitary, branched above, finely grooved, solid, glabrous. Leaf blade triangular to ovate, 8–15 × 4–7 cm, 3-pinnatisect, glabrous; pinnae petiolulate; ultimate segments filiform or narrowly linear, 20–50 × 0.5–2 mm, obtuse. Cauline leaves appressed to stem, uppermost 2–3-pinnate. Synflorescence corymbose; umbels 5–9 cm across; bracts absent; rays 15–35, 2.5–3 cm, almost equal, ribbed, glabrous; bracteoles 8–10, linear or filiform, slightly shorter than pedicels, herbaceous; umbellules 20–30-flowered; pedicels 2.5–4 mm. Calyx teeth short, triangular, glabrous. Petals white, emarginate, glabrous. Fl. and fr. times not recorded.

- Stony and gravelly slopes; ca. 1000 m. Jilin (Saratsi).

This rather poorly known taxon is recorded only from a few localities.


硬枝西风芹 ying zhi xi feng qin

Plants 25–35 cm, polycarpic. Caudex branched. Stems several, branched from base, solid, rigid, smooth, glabrous. Leaf blade rhombic to lanceolate-ovate, 7–12 × 2–4 cm, pinnatisect, glabrous; pinnae sessile or shortly petiolulate; ultimate segments filiform or linear-lanceolate, 5–7 × 1–2 mm, toothed, acute. Synflorescence corymbose; umbels 3–6 cm across; bracts absent or 1–2, small; rays 6–8(–10), equal, glabrous; bracteoles ca. 10, narrowly lanceolate, puberulous; umbellules 12–30-flowered. Calyx teeth narrowly triangular, small. Petals white, emarginate, abaxially puberulent. Stylodium low-conic; styles reflexed. Ovaries and young fruit densely tomentose (mature fruit unknown); ribs equal, filiform; vittae solitary in each furrow, 2 on commissure. Fl. and fr. times not recorded.

- Schistose steppe slopes, rock crevices; ca. 1000 m. Xinjiang.


微毛西风芹 wei mao xi feng qin


微毛西风芹 we mao xi feng qin


Plants 25–50 cm, polycarpic. Caudex branched. Stems several, dichotomously branched from middle, solid, terete, minutely puberulent. Leaf blade oblong, 8–12 × 1.5–2 cm, 2–3-pinnatisect, greenish pubescent; pinnae short-petiolulate; ultimate segments narrowly lanceolate to linear, 3–10 × 0.5–1.5 mm, acute. Upper leaf blades entire, linear, short. Synflorescence thyrsoid; umbels 1.5–2 cm across; bracts absent; rays 4–6(–10), 1–1.4 cm, slightly unequal, scabrous; bracteoles 5–8, linear-lanceolate, entire, 1.1–1.6 mm, scabrous, margin bibranchi; umbellules ca. 15-flowered; pedicels 1.5–2.5 mm. Calyx teeth obsolete. Petals white or pale yellow, abaxially pubescent. Stylodium conic; styles reflexed. Fruit ovoid or obo-
void, slightly dorsally compressed, 5–6 × 2.5–3 mm, sparsely pilose when young, almost glabrous at maturity; dorsal ribs filiform, margin ribs winged; vittae 3–5 in each furrow, 10–12 on the commissure. Fl. and fr. Jun.–Jul.

Dry stony schistose slopes; 700–900 m. Qinghai, Xinjiang [Kazakhstan].

This plant is very similar to the following species, 

17. **Seseli coronatum** Ledebour, Fl. Altaic. 1: 336. 1829.

Stems several, branched at base or above, solid, terete, glabrous or minutely scabrid at base, branches elongate, rigid. Basal leaves numerous, petiole sheaths ovate. Petals white, oblong or suborbicular, abaxially puberulous. Stylet gymnoconic, base undulate; styles reflexed. Fruit oblong, slightly dorsally compressed, ca. 2 × 1 mm, glabrous; ribs all filiform, prominent, lateral ribs slightly broader than dorsal, narrowly winged; vittae 3–5 in each furrow, 8–12 on commissure, unequal. Fl. and fr. Jun.–Jul.

Dry, gravelly slopes, steppe; 1000–1300 m. Xinjiang [Kazakhstan].

This species was misidentified in FRPS (55(2): 197. 1985) as 


Plants 50–70 cm, monocarpic. Caudex simple. Stem solitary, slender, branched above, finely grooved, glabrous. Basal leaves many, petiole sheaths ovate, scarious-margined; blade ovate, 5–15 × 2–4 cm, 3-pinnate; petals white, oblong or suborbicular, abaxially puberulous. Stylet gymnoconic, base undulate; styles reflexed. Fruit oblong, slightly dorsally compressed, (3–)4–6 × (1.5–)2.5–3.5 mm; dorsal ribs filiform, prominent, lateral ribs slightly broader than dorsal, narrowly winged; vittae 3–5 in each furrow, 8–12 on commissure, unequal. Fl. and fr. Jun.–Sep.

Plants 30–50 cm, monocarpic. Caudex simple. Stem solitary, slender, branched above, finely grooved, glabrous. Basal leaves many, petiole sheaths ovate, scarious-margined; blade ovate, 5–15 × 2–4 cm, 3-pinnate; petals white, oblong or suborbicular, abaxially puberulous. Stylet gymnoconic, base undulate; styles reflexed. Fruit oblong, slightly dorsally compressed, 3–5 × 2–3.5 mm, puberulent; ribs all filiform, slightly prominent; vittae 2–3 in each furrow, 4–6 on commissure. Fl. and fr. Aug.–Oct.

This poorly known taxon is recorded only from the type gathering.


Plants 30–50 cm, monocarpic. Caudex simple. Stem solitary, slender, branched above, finely grooved, glabrous. Basal leaves many, petiole sheaths ovate, scarious-margined; blade ovate, 5–15 × 2–4 cm, 3-pinnate; petals white, oblong or suborbicular, abaxially puberulous. Stylet gymnoconic, base undulate; styles reflexed. Fruit oblong, slightly dorsally compressed, 3–5 × 2–3.5 mm, puberulent; ribs all filiform, slightly prominent; vittae 2–3 in each furrow, 4–6 on commissure. Fl. and fr. Aug.–Oct.

This rather poorly known species is recorded only from a few collections. See the taxonomic note under **Seseli tschudii**.
3a. Petals yellow or light yellow, rarely pinkish.

4a. Bracts developed.
   5a. Leaf blades ternate; leaflet venation parallel ................................. 3. S. delavayi
   5b. Leaf blades 1–2-pinnatisect; leaflet venation reticulate.
      6a. Plants 20–40(–60) cm; caudex divided; umbellules 10–20-flowered; fruit elliptic to oblong-linear; seed face plane ............................................................ 4. S. pelliotii
      6b. Plants (30–)35–100 cm; caudex undivided; umbellules 8–10-flowered; fruit ovoid; seed face deeply grooved .................................................. 5. S. nudum

4b. Bracts obsolete.

7a. Plants polycarpic; caudex branched, lignified; flowers and fruit subsessile ................................................. 6. S. sessiliflorum

7b. Plants monocarpic; caudex undivided; pedicels developed.

8a. Ovaries and fruit pubescent; umbel rays very unequal .......................................................... 7. S. valentinae

8b. Ovaries and fruit glabrous; umbels rays almost equal.

9a. Bracteoles free at base; petal secretory ducts solitary; dorsal mericarp ribs filiform, marginal ribs winged ........................................... 10. S. incisodentatum

9b. Bracteoles connate at base; petals secretory ducts several; mericarp ribs almost equally short-winged.

10a. Leaf blade 1–2-ternately dissected ........................................................ 8. S. yuananense

10b. Leaf blade simple, undivided .................................................. 9. S. simplicifolium

3b. Petals white, greenish or pale.


12a. Stems smooth or grooved; terminal leaf lobes narrowly linear; fruit glabrous ......................................... 14. S. strictum

12b. Stems angled or sharp-ribbed; terminal leaf lobes lanceolate to ovate; fruit pubescent.

13a. Leaf blades shiny, rigid, terminal lobes ovate or obovate .................................................... 11. S. buchtormense

13b. Leaf blades matt, not-rigid, terminal lobes lanceolate to broadly lanceolate.

14a. Vittae solitary in each furrow, 2 on commissure; stems angled, corymbose-branched above .............. 12. S. libanotis

14b. Vittae 1–4 in each furrow, 4–6 on commissure; stems ribbed, thyrsoid-branched from middle .......... 13. S. seseloides


15a. Bracts several or many.

16a. Fruit glabrous; leaf blade 1–2-pinnatisect .................................................. 17. S. mucronatum

16b. Fruit pubescent; leaf blade usually 2–3-pinnatisect, rarely pinnatisect.


18a. Vittae 2–4 in each furrow; stems hollow; bracteoles longer than flowers; styles straight or slightly reflexed .......................................................................................... 31. S. condensatum

18b. Vittae solitary in each furrow; stems solid; bracteoles shorter than flowers; styles reflexed.

19a. Plants monocarpic; stem solitary, gray-white tomentose; caudex undivided ................................. 32. S. incanum

19b. Plants polycarpic; stems several, green, scattered hairy; caudex branched .................................. 33. S. schrenkianum


20a. Terminal leaf lobes ovoid, ovoid-lanceolate or rhombic ................................................ 34. S. laticalycinum

20b. Terminal leaf lobes narrowly lanceolate to linear.

21a. Calyx teeth obsolete; plants polycarpic; caudex branched, lignified; stems and leaves glabrous; fruit 7.5–10 mm .................................................. 35. S. aemulans

21b. Calyx teeth prominent; plants monocarpic and polycarpic; caudex branched or undivided; stems and leaves pubescent or glabrous; fruit 2.8–5.5 mm (except 7.5–10 mm in S. eriocarpum).

22a. Plants 100–200 cm, monocarpic; caudex undivided; stems thick .............................................. 36. S. vaillantii

22b. Plants 25–60(–80) cm, polycarpic; caudex branched.

23a. Fruit ribs equal, filiform; vittae solitary in each furrow ....................................................... 37. S. eriocarpum

23b. Fruit ribs unequal, dorsal ribs keeled, marginal ribs larger; vittae solitary or 2–3 in each furrow.

24a. Marginal fruit ribs slightly larger than dorsal, all ribs thickened, obtuse; vittae solitary in the furrows, 2 on the commissure .................................................. 38. S. abolinii

24b. Marginal fruit ribs considerably larger than dorsal, all ribs keeled, acute; vittae 2–3 in the furrows, 4–6 on the commissure ............................................ 39. S. grubovii

15b. Bracts absent or 1–2.

25a. Fruit and ovaries with white membranous disk at base; fruit almost glabrous ............................. 15. S. glabratum

25b. Fruit and ovaries without disk at base; fruit pubescent, rarely glabrous.

26a. Fruit and ovaries glabrous.

27a. Bracteoles absent ..................................................................................... 16. S. purpureovaginatum

27b. Bracteoles several .................................................................................... 17. S. mucronatum

26b. Ovaries pubescent; fruit pubescent, almost glabrous (S. asperulum), or glabrous (S. coronatum).

28a. Caudex branched; plants polycarpic.
29a. Terminal leaf lobes rhombic to ovoid; rays 3–4
29b. Terminal leaf lobes linear-lanceolate to linear; rays 4–10.
30a. Calyx teeth prominent; fruit densely pubescent; ribs equal, filiform; vittae solitary in each furrow, 2 on commissure ................................................................. 18. *S. togasii*
30b. Calyx teeth obsolete; fruit glabrous or minutely pubescent; dorsal ribs filiform, marginal ribs narrowly winged; vittae 3–5 in each furrow, 8 on commissure.
31a. Leaf blade greenish pubescent; stems, rays and bracts scabrous; bracteoles 5–8; mature fruit minutely pubescent .................................................................................. 19. *S. junatovii*
31b. Plant completely glabrous; bracteoles 8–10; fruit glabrous ............................................. 20. *S. asperulum*
28b. Caudex undivided; plants monocarpic.
32a. Bracteoles connate up to middle; flowers almost sessile; umbellules 20–30-flowered ........ 22. *S. eriocephalum*
32b. Bracteoles free, or connate only at base; pedicels prominent; umbellules 5–20(–30)-flowered.
33a. Stems and leaves glabrous.
33a. Fruit papillate; stylodium low-conic; styles reflexed; terminal leaf lobes 3–15 × 0.5–1 mm .................................................................................. 23. *S. intramongolicum*
34b. Fruit densely hairy; stylodium conic; styles almost straight; terminal leaf lobes 30–60 × 5–7 mm .................................................................................. 24. *S. lancifolium*
33b. Stems and leaves puberulent.
35a. Leaves 2–3-pinnatisect, primary segments long petiolulate.
35b. Leaves 1-pinnatisect, primary segments short petiolulate or sessile.
36a. Rays very unequal; vittae 2–3 in each furrow, 4–6 on commissure ............................... 25. *S. sandbergiae*
36b. Rays ca. equal; vittae solitary in each furrow, 2 on commissure .................................. 26. *S. jinanense*
37a. Stem base not covered by remnant sheaths; styles reflexed ........................................ 30. *S. albescens*
37b. Stem base densely covered by triangular or lanceolate remnant sheaths; styles straight or reflexed.
38a. Rays 3–4; plants slender; terminal leaf lobes lanceolate to linear, 4–12 mm ............ 27. *S. lanzhouense*
38b. Rays 5–15; plants robust; terminal leaf lobes ovoid, 15–50 mm. ................................ 28. *S. spodotrichoma*
39a. Rays 5–12; rays and pedicels sparsely pubescent; terminal leaf lobes pubescent; petals white ................................................................. 29. *S. wannienchun*
39b. Rays 10–15; rays and pedicels densely pubescent; terminal leaf lobes minutely pubescent or almost glabrous; petals greenish-white .................................................. 29. *S. wannienchun*


*Ligusticum mucronatum* (Schrenk) Leute;
*L. thomsonii* C. B. Clarke;
*Pleurospermum longicaule* H. Wolff;
*Neogaya urbis-malorum* Popov.

*Libanotis lancifolia* K. T. Fu.

*Libanotis jinanensis* L. C. Xu & M. D. Xu.


*Libanotis spodotrichoma* K. T. Fu.

*Libanotis wannienchun* K. T. Fu.

*Eriocyla albescens* (Franchet) H. Wolff.

*Libanotis condensata* (Linnaeus) Crantz (but excluding *Seseli laserpitifolium* Palibin; see species no. 13, *S. seseloides*).

*Libanotis incana* (Stephan ex Willdenow) Fedtschenko & B. Fedtschenko.

*Libanotis schrenkiana* C. A. Meyer ex Schischkin.

35. *Seseli aemulans* Popov.

*Libanotis iliensis* (Lipsky) Korovin.

*Libanotis eriocarpa* Schrenk.

*Libanotis abolinii* (Korovin) Korovin.


水芹属   shui qin shu

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

*Dasyloma* de Candolle; *Phellandrium* Linnaeus.

Herbs, perennial, glabrous. Roots fibrous or fusiform to ovoid tubers. Stems erect, branching, decumbent, weakly diffuse or stoloniferous, hollow, angular, striate, rooting at basal nodes. Basal and lower leaves petiolate, wholly sheathing; blade 1–4-pinnate, homomorphic or heteromorphic to the cauline leaves. Umbels compound, loose, terminal and axillary or leaf-opposed; bracts absent, or occasionally 1; rays 4–15(–30); bracteoles numerous. Calyx teeth prominent, lanceolate, nearly as long as stypeodium. Petals white or pale pink, obovate, base cuneate, apex emarginate, with small incurved lobule, outer petals in umbellule usually enlarged (radiant). Stypeodium conic; styles elongate, erect or divergent, sometimes reflexed in fruit. Fruit ovoid or subglobose, slightly compressed dorsally or laterally, glabrous; dorsal and intermediate ribs slightly thickened, corky, or somewhat protruding, filiform, subequal; lateral ribs dilated, subtriangular, corky; vittae solitary in each furrow, 2 on commissure. Seed face plane. Carpophore obsolete.

Between 25 and 30 species: Africa, Asia, Europe, North America; five species in China.

1a. Dorsal and intermediate fruit ribs thickened, corky; leaves homomorphic, ultimate segments ovate or rhombic-ovate, 2–6 × 1–2 cm ................................................................................................................................. 1. *O. javanica*
1b. Dorsal and intermediate fruit ribs slightly thickened, corky, or somewhat protruding, filiform; leaves homomorphic or heteromorphic, ultimate segments linear, lanceolate, rarely ovate or rhombic-ovate, smaller, 1–3 × 0.5–1 cm.

2a. Peduncles 0.5–1(–2) cm, or obsolete; ultimate segments rhombic-ovate, rarely lanceolate .................................. 2. O. benghalensis

2b. Peduncles 2–25 cm; ultimate segments lanceolate, rarely rhombic-ovate.

3a. Leaves 1-pinnate, pinnae mostly reduced, rachis only with a few subulate and remote pinnae ..................... 3. O. hookeri

3b. Leaves 1–4-pinnate, pinnae not reduced.

4a. Leaves 1–2-pinnate, ultimate segments linear, 20–40 × 1–2 mm, rarely rhombic-ovate ........................... 4. O. linearis

4b. Leaves 3–4-pinnate, linear, minute, 2–3 × 1–2 mm ................................................................. 5. O. thomsonii

The shoots and leaves comprise the dietary herb “shui qin” of traditional Chinese medicine.

1b. Oenanthe javanica subsp. rosthornii (Diels) F. T. Pu, Novon 8: 70. 1998.

卵叶水芹 luan ye shui qin


Grassland at forest margins, marshes, water meadows, river banks; 1400–4000 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Sichuan, Taiwan, Yunnan [Thailand].

This variety has reputed medicinal value.


短辐水芹 duan fu shui qin

Seseli benghalense Roxburgh, Fl. Ind., ed. 1832, 2: 93. 1832; Dasylosma benghalense (Roxburgh) de Candolle; D. glaucum de Candolle.

Plants 15–60 cm. Roots fibrous. Stems usually erect, angular, branched from base. Basal petioles 1–4 cm; blade triangular-ovate, 1–2-pinnate; ultimate segments rhombic-ovate, rarely lanceolate, 5–20 × 1–5 mm. Upper leaves smaller, sessile, 1-pinnate, pinnae rhombic ovate or lanceolate. Umbels 0.5–3.5 cm across; peduncles short, 0.5–1(–2) cm, often leaf-opposed, or obsolete; bracts absent; rays 4–10, 0.5–1 cm; bracteoles numerous, linear, as long as pedicels, umbellules 8–15-flowered; pedicels 0.5–2 mm. Calyx teeth ca. 0.4 mm. Styles 1.4–1.8 mm. Fruit ovoid, 2.5–3 × 1.5–2 mm; dorsal and intermediate ribs slightly thickened, corky. Fl. May–Jun, fr. Jun–Jul.

Moist ground at forest margins, marshes, water meadows, irrigation ditches; 500–1500 m. Guangdong, Sichuan, Yunnan [N India].

This species has reputed medicinal value. It is very similar to, and possibly not distinct from, Oenanthe javanica (see the comment under the latter species); the two differ in umbel and fruit characters.


高山水芹 gao shan shui qin

Plants 40–80 cm, slender. Stems decumbent, scarcely branched, rooting at lower nodes. Leaves mostly reduced, 1-pinnate, fistular; pinnae few, remote on the rachis, subulate, 5–15 × 0.5–1 mm. Umbels 1.5–3 cm across; peduncles elongate,
5–8 cm; bracts absent, or occasionally 1, linear, 0.5–2.5 cm; rays 4–8, 0.5–1.5 cm, unequal, sometimes pubescent; bracteoles 3–5, linear, 3.5–5 × 0.5 mm, unequal; umbellules 15–20-flowered; pedicels 2–3 mm, unequal. Calyx teeth ca. 0.6 mm. Styles ca. 0.6 mm. Fruit ovoid, ca. 2 × 1.5 mm; dorsal and intermediate ribs slightly thickened, corky.

- Open forests, grassy slope, marshlands; 1100–2500 m. Guizhou, Sichuan, Yunnan [?Laos].

Recent records from Laos require confirmation. This variety is used in Guizhou and Yunnan as a regional substitute for “shui qin,” a dietary herb of traditional Chinese medicine (see Oenanthe javanica).


多裂叶水芹 duo lie ye shui qin

Plants 20–50 cm, weak, diffuse. Roots fascicled or fibrous. Stems slender, creeping, branched. Leaves homomorphic, 3–4(–5)-pinnate; primary pinnae 5–7 pairs; ultimate segments short linear, 2–3 × 1–2 mm. Umbels 3–8 across, frequently leaf-opposed; peduncles elongate, 2.5–10 mm; bracts absent; rays 4–12, 1.5–3.5 cm, unequal; bracteoles 3–8, linear, 1.5–4 cm; umbellules 15–20-flowered; pedicels 3–5 mm, unequal. Styles ca. 1 mm, reflexed. Fruit subglobose, ca. 2 × 1.5 mm; dorsal and intermediate ribs protruding, filiform. Fl. Jul–Aug, fr. Sep–Oct.

Moist shaded areas among shrubs and trees, marshy, moist grasslands, river banks, streamsides; 1800–3500 m. Chongqing, Guangdong, Guizhou, Hubei, Jiangxi, Sichuan, Xizang, Yunnan [Bhutan, India, Myanmar, Nepal, Sikkim, ?Vietnam].

This variety has reputed medicinal value.

5b. Oenanthe thomsonii subsp. stenophylla

窄叶水芹 zhai ye shui qin

Oenanthe thomsonii var. stenophylla (H. de Boissieu) H. de Boissieu, Bull. Herb. Boissier, sér. 2, 3: 843. 1903; O. dielsii H. de Boissieu subsp. stenophylla (H. de Boissieu) C. Y. Wu & F. T. Pu; O. dielsii var. stenophylla (H. de Boissieu) H. de Boissieu.

Stems erect. Leaves 2–3-pinnate; ultimate segments linear, 5–20 × ca. 1 mm.

- Moist shaded areas among shrubs and trees, river banks; 1000–3500 m. Chongqing, Guizhou, Hubei, Jiangxi, Sichuan, Xizang, Yunnan [?Vietnam].

This variety has reputed medicinal value in C China.

苞裂芹属 *bao lie qin shu*

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

Herbs perennial, glabrous. Tap root cylindrical. Stem conspicuous, erect, or obsolete, base clothed in fibrous remnant sheaths. Basal leaves petiolate, sheaths dilated, white and membranous at margins; blade 2–3-pinnate; ultimate segments linear-lanceolate or linear. Umbels compound, terminal and lateral; rays stout, subequal or unequal; bracts and bracteoles 2–3-pinnate; umbellules many-flowered. Calyx teeth minute or obsolete. Petals white, obovate, base cuneate, apex with small incurved lobe. Stylodium conic; styles erect, divergent or reflexed. Fruit oblong-ovoid or ovoid, slightly compressed laterally; ribs narrow, slightly winged; vitiae 3–4 in each furrow, 4–8 on commissure. Seed face plane. Carpophore 2-parted.

About four species: C Asia, Himalayan region; four species in China.

1a. Rays subequal; bracteoles nearly as long as or exceeding umbellules.

2a. Leaves 3-pinnate; bracteoles 2–3-pinnate, nearly equal to umbellules .......................................................... 1. *S. crinita*

2b. Leaves 2-pinnate; bracteoles 3-lobed or 1-pinnate, subequal or exceeding flowering umbellules ....................... 2. *S. dissecta*

1b. Rays unequal; bracteoles subequal or shorter than umbellules.

3a. Leaves 2–3-pinnate; rays of terminal umbel stout, elongate; bracteoles entire, 2–3-lobed or pinnate ................. 3. *S. prostrata*

3b. Leaves 3-pinnate; rays of terminal and lateral umbellules subequal; bracteoles 2-pinnate ................................... 4. *S. albilora*


长毛苞裂芹 *chang mao bao lie qin*


Plants 10–45 cm. Rootstock rather thick, branched. Stem single, striate, little-branched or unbranched. Basal leaves petiolate; blade oblong, 6–12 × 1.5–2.5 cm, 3-pinnate; ultimate segments linear, 2–3 × 0.5–1 mm. Cauline leaves gradually reduced upward. Umbels 1–3, rarely more, 4–8 cm across; bracts 2–3-pinnate, nearly as long as rays; rays 12–15, stout, subequal; bracteoles numerous, similar to bracts, nearly as long as umbellules. Calyx teeth obsolete. Styles erect or divergent after flowering, ca. 2 mm, 2–3 times as long as stylodium. Fruit oblong-ovoid, 3–4 × 1.5–2 mm; vitiae 3–4 in each furrow, 4–8 on commissure. Fl. and fr. Jun–Aug.

Mossy forests, among shrubs in alpine meadows; 2500–2900 m. Xinjiang [Kazakhstan, Mongolia, Russia (Siberia)].


苞裂芹 *bao lie qin*

*Trachydium dissectum* C. B. Clarke in J. D. Hooker, Fl. Brit. Ind. 2: 672. 1879.

Plants 5–30 cm, slender. Stem simple or 1–2-branched at base. Leaves 2-pinnate; ultimate segments linear, 1–2 × 0.5–0.8 mm. Umbels 1–3 cm across; bracts oblong or oval, apex pinnatifid; rays 10–20, 1–3 cm; subequal; bracteoles 5–7, similar to bracts, subequal or exceeding flowers; umbellules 8–20-flowered. Calyx teeth obsolete. Fruit ovoid, brown with pale ridges when mature, 2–3 × ca. 0.75 mm, slightly compressed dorsally; ribs filiform or obscure; vitiae 3–4 in each furrow, 4–8 on commissure. Fl. and fr. Aug.–Oct.

High-altitude semi-stable screes; 5100–5300 m. S Xizang (Rongbuk N of Qomolangma Feng, Yadong) [Bhutan, Nepal, Sikkim].


天山苞裂芹 *tian shan bao lie qin*

Plants ca. 10 cm. Stem short, unbranched. Leaves petiolate; blade oblong-lanceolate in outline, 2–3-pinnate; primary pinnate 3–5 pairs; ultimate segments lanceolate or linear, 2–3 × ca. 1 mm, acute. Terminal umbels 12–15 cm across, lateral umbels 3–4 cm across; bracts 3–5, entire or apex 2–3-lobed; rays of terminal umbel 5–13, very stout, elongate, 8–13 cm, unequal and diffuse; bracteoles 5–10, apex 2–3-lobed or pinnate, rarely entire. Calyx teeth minute or obsolete. Fruit broadly ovoid, ca. 3 × 1.5–2 mm, tuberculate; vitiae 2–3 in each furrow, 6 on commissure. Fl. and fr. Jun–Aug.

Alpine meadows; 2500–3200 m. Xinjiang (Tian Shan) [Kyrgyzstan].

This species was misidentified in FRPS (55(1). 203. 1979) as *Trachydium tianshanicum* Korovin, which is distributed in C Asia.

4. **Schulzia albilora** (Karelin & Kirilov) Popov, Fl. Almaat Gos. Zapovedn. 35. 1940.

白花苞裂芹 *bai hua bao lie qin*


Plants 20–30 cm. Stem usually obsolete, branches spreading-ascending from the base. Leaves oblong-lanceolate, 3-pinnate; ultimate segments linear-lanceolate or linear, 2–4 × 0.5–1 mm. Umbels numerous, 3–7 cm across; bracts numerous, 2-pinnate, similar to leaves, nearly as long as rays; rays 10–20(–30), 1.5–3 cm, unequal; bracteoles similar to bracts, nearly as long as pedicels. Calyx teeth obsolete. Fruit oblong-ovoid, ca. 3 × 1 mm; vitiae 3 in each furrow, 8 on commissure. Fl. and fr. Jul–Aug.

Alpine meadows, grassy slopes; 2700–4600 m. Xinjiang [Kazakhstan, Kyrgyzstan, Russia (Siberia), Tajikistan].
**63. FOENICULUM** Miller, Gard. Dict. Abr., ed. 4. 1754.

茴香属 hui xiang shu

*She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson*

Herbs, annual or perennial, all parts strongly aromatic (anise-scented). Stem erect, terete, gray-green or lurid-green, glabrous. Leaves petiolate, sheaths membranous-margined; blade pinnately decompound; ultimate segments linear. Umbels compound, terminal and lateral; bracts and bracteoles absent; rays numerous, upwards-spreading, unequal. Calyx teeth obsolete. Petals yellow, obovate, mid rib conspicuous, apex with narrowly inflexed lobule. Stylododium conic; styles very short, reflexed. Fruit oblong, terete, glabrous; ribs 5, acute or round-obtuse; vitiae 1 in each furrow, 2 on commissure. Seed face plane or slightly concave. Carpophore 2-cleft to base.

One species: Mediterranean region; cultivated and adventive worldwide, including in China.


茴香 hui xiang

*Aethnium foeniculum* Linnaeus, Sp. Pl. 1: 263. 1753; *A. pannorum* Roxburgh; *Foeniculum officinale* Allioni; *F. pannonium* (Roxburgh) de Candolle; *Ligusticum foeniculum* (Linnaeus) Crantz; *Meum foeniculum* (Linnaeus) Sprengel; *Selinum foeniculum* (Linnaeus) E. H. L. Krause; *Seseli foeniculum* (Linnaeus) Koso-Poljansky.

Plants 0.4–2 m. Lower petioles 5–15 cm; blade broadly triangular in outline, 4–30 × 5–40 cm, 4–5-pinnatisect; ultimate segments linear, 1–6 × ca. 0.1 mm. Umbels 5–9 cm across; peduncles 2–25 cm; rays 6–29(–40), unequal, 1.5–10 cm; umbelules 14–39-flowered; pedicels thin, 2–10 mm, unequal. Fruit 4–6(–10) × 1.5–2.2(–2.5) mm. Fl. May–Jun, fr. Jul–Sep.

Cultivated and adventive; 200–2600 m. Throughout China [native to the Mediterranean region; cultivated and adventive worldwide].

The stem, leaves, and fruit are commonly used as the dietary herb “xiao hui xiang” in traditional Chinese medicine to aid digestion. The leaves are used for flavoring and the fruits are used as a spice (fennel).

**64. ANETHUM** Linnaeus, Sp. Pl. 1: 263. 1753.

莳萝属 shi luo shu

*She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson*

Herbs, annual or biennial. Stem erect, terete. Basal leaves petiolate, sheaths scarious-margined; blade 2–3-pinnately dissected; ultimate segments narrowly linear. Inflorescence of loose compound umbels; peduncles much-branched; bracts and bracteoles absent; rays numerous, unequal. Calyx teeth obsolete. Petals yellow, costa brown, apex very incurved. Stylododium conic, styles short, erect when young, spreading or recurved after flowering. Fruit ellipsoid or ovoid-ellipsoid, conspicuously flattened dorsally; dorsal ribs filiform, slightly prominent, lateral ribs narrowly winged, tapering at both ends; vitiae 1 in each furrow, 2 on commissure. Seed face plane. Carpophore 2-cleft to base.

One species: Mediterranean region; cultivated and adventive worldwide, including in China.


莳萝 shi luo

*Anethum graveolens* subsp. *sowa* (Roxburgh) N. F. Koren; *A. sowa* Roxburgh; *Ferula marathrophylla* W. G. Walpers; *Peucedanum anethum* Baillon; *P. graveolens* (Linnaeus) Hiern; *P. sowa* (Roxburgh) Kurz.

Plants 30–75(–100) cm, glabrous, strongly aromatic. Basal leaf blade broadly ovate, 3–4-pinnately dissected; ultimate segments narrow linear, 4–20 × ca. 0.5 mm. Upper leaves smaller and less divided, petioles sheathing throughout. Umbels 5–15 cm across; rays 10–25, 3–5 cm; umbellules 15–25-flowered; pedicels 6–10 mm. Fruit brown, 3–5 × 2–2.5 mm; lateral ribs gray-white, narrowly winged. Fl. May–Aug, fr. Jul–Sep.

Cultivated and adventive; 200–1500 m. Gansu, Guangdong, Guangxi, Sichuan [native to the Mediterranean region; cultivated and adventive worldwide].

The fruits are used in the traditional Chinese medicine “shi luo” and as a spice (dill).

**65. SILAUM** Miller, Gard. Dict. Abr., ed. 4. 1754.

亮叶芹属 liang ye qin shu

*She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson*

*Silaus* Bernhardi.

Herbs, perennial, glabrous. Stem erect, solid, striate, base clothed in fibrous remnant sheaths. Leaves long-petiolate, 3–4-pinnate; ultimate segments broadly lanceolate to linear, acute. Umbels compound, terminal and lateral; bracts absent or few, linear, deciduous; bracteoles numerous. Calyx teeth minute, conspicuous. Petals yellow, outer reddish-tinged, ovate, midvein elevated on both surfaces, apex narrowly inflexed. Stylododium low-conic; styles short, reflexed. Fruit ovoid-oblong to subcylindrical, glabrous;
mericarps subpentagonal in cross section; ribs 5, acute, narrowly winged; vittae small, numerous, obscure when mature. Seed face plane. Carpophore 2-cleft to base.

One to five species: Europe and the Mediterranean region; one species (introduced) in China.

The circumscription of *Silaum* is controversial, with some authors treating it as a unispecific genus (with only *S. silaus*) and others including up to five species.


亮叶芹 *liang ye qin*

*Peucedanum silaus* Linnaeus, Sp. Pl. 1: 246. 1753; *Seseli pratensis* Crantz; *Silaus flavescens* Bernhardi; *S. pratensis* (Crantz) Besser.

Plants 40–100 cm. Leaf blade triangular-ovate, 7–20 × 6–10 cm; lateral pinnae short-petiolulate, 2–5-lobed, terminal pinnae 3–7-lobed; ultimate segments lanceolate to linear-lanceolate, 13–20 × 2–3 mm, abaxial veins prominent, margins cartilaginous, apex acute or acuminate, apiculate. Upper leaves 2-pinnate, narrowly linear, apical leaves reduced, segments filiform. Umbels 2.5–4 cm across; rays 5–10, 1–3 cm, unequal; bracteoles linear-lanceolate, 3–5 mm, shorter than flowers, margin scarious; umbellules many-flowered; pedicels 4–8 mm. Fruit 4–8 × 2–3 mm. Fl. and fr. Jun–Sep.

Adventive in wet meadows; 100–300 m. Jiangsu [native to Europe and the Mediterranean region].


翅棱芹属 *chi leng qin shu*

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

Herbs, perennial, essentially glabrous, inflorescence slightly scabrous. Root fusiform. Stem erect, branched, striate, sometimes rooting at basal nodes. Basal leaves petiolate, sheathing; blade 1–2-pinnate or ternate–2–3-pinnate; ultimate segments linear or linear-lanceolate, entire. Inflorescence little-branched, umbels compound, terminal and lateral, rarely only terminal; bracts and bracteoles linear; rays rather few, spreading. Calyx teeth conspicuous. Petals white, obovate, base cuneate, apex retuse with small incurved lobule. Stylodium conic; styles slightly longer than the stylodium, reflexed. Fruit ovoid, slightly compressed laterally; ribs 5, prominent, corky dilated at base, narrowly winged; vittae 1 in each furrow, 2 on commissure. Seed face plane. Carpophore 2-cleft to base.

One species: China, Japan, Korea.


脉叶翅棱芹 *mai ye chi leng qin*


Plants 70–100 cm. Basal leaves ovate, 10–15 × 4–8 cm; ultimate segments 20–100 × 1–3 mm. Upper cauline leaves smaller, 3-lobed or entire, sessile on expanded sheaths. Terminal umbels 3–5 cm across; peduncles 1–5 cm; bracts 5–10, linear, 3–10 × 1–2 mm; rays 6–8(–20), 2–3.5 cm, subequal; bracteoles 6–8, similar to bracts, 1–3 mm; pedicels slender, 3–8 mm, unequal. Calyx teeth lanceolate, ca. 1 mm, longer than the stylodium. Fruit 3–3.5 × 2.5–3 mm. Fl. and fr. Sep–Nov.

Streamside, damp areas. Anhui, Jiangsu, Zhejiang [Japan, Korea].


石蛇床属 *shi she chuang shu*

Pu Fading (溥发鼎 Pu Fa-ting); Michael G. Pimenov

Herbs glabrous, perennial, monocarpic. Rootstock vertical, branched. Stem solitary, branched from the base, hollow, ribbed, base clothed in fibrous remnant sheaths. Basal leaves petiolate; blade 1–2-pinnate or ternate–2–3-pinnate; terminal segments linear or linear-lanceolate, entire. Inflorescence little-branched, umbels compound, terminal and lateral, rarely only terminal; bracts and bracteoles linear; rays rather few, spreading. Calyx teeth obsolete. Petals greenish, emarginate, apex inflexed. Stylopodium flat, deeply lobed; styles reflexed. Fruit oblong, slightly dorsally compressed, glabrous; ribs ridged, subequal; commissure narrow; vittae 1 in each furrow, 2 on commissure. Seed face plane. Carpophore 2-cleft to base.

Two species: C and N Asia; one species in China.


石蛇床 *shi she chuang*

**蛇床属** she chuang shu

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

Herbs, perennial or biennial, rarely annual. Stems usually solitary, sometimes several, branches slender. Basal and lower leaves 2–3-pinnate or 1–2-pinnate; ultimate segments obovate, linear-lanceolate or linear. Upper leaves reduced, smaller, sessile on expanded sheaths. Umbels compound, terminal and lateral; bracts several, usually persistent, linear to lanceolate, rarely caducous; rays 6–15(–20); bracteoles several, linear. Calyx teeth usually obsolete, occasionally minute. Petals white or pinkish, base cuneate, apex notched, with narrow incurved lobule. Stylodium conic or low-conic; styles longer than stylodium, reflexed after flowering. Fruit oblong-ovoid or subglobose, slightly compressed dorsally; ribs 5, narrowly corky-winged, lateral ribs a little broader than the others, or ribs subequal; vittae 1 in each furrow, 2 on commissure. Seed face plane, rarely slightly concave. Carpophore 2-parted.

Six to eight species: Asia, Europe; five species (one endemic) in China.

1a. Bracteoles oblong or oblong-ovate, broadly white membranous-margined; fruit oblong-ovoid, 3–5 × 2–3 mm .... 1. C. dauricum
1b. Bracteoles linear, narrowly or hardly membranous-margined; fruit ovoid, oblong-ovoid or subglobose, 1.5–3.5 × 1–3.5 mm.

2a. Fruit subglobose, 2.3–3.5 × 2–3.5 mm; stems several; leaves 1–2-pinnate .......................................................... 2. C. japonicum
2b. Fruit ovoid or oblong-ovoid, 1.5–3 × 1–2 mm; stem solitary; leaves 2–3-pinnate.

3a. Bracts persistent; bracteole margin very finely ciliate ............................................................ 3. C. monnieri
3b. Bracts caducous; bracteole margin slightly scabrous, without cilia.

4a. Ultimate leaf segments linear-lanceolate or falcate, 5–30 × 1.5–3 mm ..................................................... 4. C. salinum
4b. Ultimate leaf segments linear, 4–15 × 0.5–1 mm .......................................................... 5. C. sinchianum


**兴安蛇床** xing an she chuang


Riparian wet grasslands or meadows; 500–2000 m. Hebei, Heilongjiang, Jilin, Nei Mong [Japan, Korea, Mongolia, Russia].


**滨蛇床** bin she chuang

*Selenium japonicum* (Miquel) Franchet & Savatier.
Calyx teeth obsolete. Fruit ovoid, 1.5–3 × 1–2 mm.


3a. var. monnieri

蛇床(原变种) she chuang (yuan bian zhong)

*Selinum monnieri* Linnaeus, Cent. Pl. I: 9. 1755; *Cicuta monnieri* (Linnaeus) Crantz; *C. sinensis* Zuccagni; *Cnidium microcarpum* Turczaninow; *C. mongolicum* H. Wolff; *Ligusticum mongolicum* (H. Wolff) Leute; *L. monnieri* (Linnaeus) Calestani; *Pinasgelon monnieri* (Linnaeus) Rafinesque; *Seseli daucifolium* C. B. Clarke.

Plants 10–80 cm. Bracteoles nearly as long as pedicels. Calyx teeth minute. Fruit subglobose, 1–2 × 1–2 mm long.

3b. var. formosanum

The fruits are used as "she chuang zi," a common herb of traditional Chinese medicine.


辛加山蛇床 xin jia shan she chuang

*Selinum sinchianum* (K. T. Fu) C. Q. Yuan & L. B. Li.

Plants perennial, 20–35 cm. Root coniform, slender. Stem erect, unbranched, glabrous. Lower leaves petiolate; blade oblong-ovate, 2–3-pinnate; ultimate segments linear-lanceolate or falcate; 5–30 × 1.5–3 mm, margins slightly revolute. Umbels 3–6 cm across; bracts caducous or occasionally one persistent, linear; rays (6–)10–15, unequal, slightly scabrous inside; bracteoles 4–6, linear, longer than pedicels, margins narrowly membranous, slightly scabrous, not ciliate. Petals white or pinkish. Stylodipodium low-conic; styles 2–3 times longer than stylodipodium, reflexed. Fruit oblong-ovoid, 2.5–3 × ca. 1.5 mm. Seed face plane or slightly concave. Fl. Jul–Aug, fr. Aug–Sep.

Damp grasslands, wet meadows. Gansu, Hebei, Heilongjiang, Neimongol, Ningxia, Qinghai [Mongolia, Russia].


碱蛇床 jian she chuang

*Cnidium salinum* var. *rhizomaticum* Y. C. Ma; *Kadenia salina* (Turczaninow) Lavrova & V. N. Tikhomirov; *Ligusticum salinum* (Turczaninow) Kosso-Poliansky; *Selinum dubium* (Schkuhr) Leute subsp. *salinum* (Turczaninow) Leute; *S. salina* (Turczaninow) Vodopianova.

Plants perennial or biennial, 20–50(–70) cm. Root 3–6 mm thick; nodes sometimes inflated. Stem solitary, striate. Basal and lower petioles 5–10 cm; blade obl-long-ovate, 6–12 × 3–10 cm, 2–3-pinnate, rarely 1–2-pinnate; ultimate segments linear-lanceolate or falcate; 5–30 × 1.5–3 mm, margins slightly revolute. Umbels 3–6 cm across; bracts caducous or occasionally one persistent, linear; rays (6–)10–15, unequal, slightly scabrous inside; bracteoles 4–6, linear, longer than pedicels, margins narrowly membranous, slightly scabrous, not ciliate. Petals white or pinkish. Stylodipodium low-conic; styles 2–3 times longer than stylodipodium, reflexed. Fruit oblong-ovoid, 2.5–3 × ca. 1.5 mm. Seed face plane or slightly concave. Fl. Jul–Aug, fr. Aug–Sep.

Riparian grasslands, field margins. Almost throughout China [India, Korea, Laos, Mongolia, Russia, Vietnam; Europe; adventive in North America].

The following species have been described from Chinese material, but are imperfectly known as no specimens have been seen or the specimens are inadequate.


3b. var. formosanum

The fruits used as the obsolete calyx teeth and the thick, slightly corky fruit ribs.


亮蛇床属 liang she chuang shu

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

Herbs perennial. Roots stout, taproot elongate or cylindrical. Stems erect, base clothed with fibrous remnant sheaths. Basal leaves 2–3-pinnate or ternate-2-pinnate. Stem leaves gradually reduced upwards, becoming sessile on expanded sheaths. Umbels...
compound, terminal and lateral; bracts entire, 2–3-lobed at apex, or 1–2-pinnate, or absent; rays numerous; bracteoles usually similar to bracts. Calyx teeth evident, linear-lanceolate, equaling or exceeding the stylodium, unequal. Petals white or pinkish, obovate, base cuneate, apex notched with small incurved lobe (except L. weberbaurianum). Stylodium conic; styles ca. 2 × stylodium, reflexed after flowering. Fruit oblong-ovoid, ovoid or suborbicular, compressed dorsally, glabrous; dorsal ribs thickened or narrowly winged; lateral ribs broad-winged (2 × dorsal wings); vittae 1(–4) in dorsal furrows, 1–4 in lateral furrows, 2–8 on commissure. Seed face plane. Carpophore 2-cliff to base.

About eight species: Asia, Europe; three species (two endemic) in China.

See the taxonomic comment under *Ligusticum*.

1a. Bracts absent; bracteoles 2-pinnate; vittae 3–4 in each furrow; leaves 2-pinnate ........................................................... 1. *S. longicalycium*

1b. Bracts several; bracteoles entire, rarely 2–3(–4)-lobed at the apex; vittae 1 in dorsal furrows, 1–4 in lateral; leaves 2–3-pinnate or ternate-2–3-pinnate.

2a. Bracteoles lanceolate, longer than umbellules, ascending, margins white membranous; fruit oblong-ovoid; dorsal ribs thickened ................................................................................................................... 2. *S. wallichianum*

2b. Bracteoles linear, shorter than umbellules, reflexed, margins scabrid; fruit ovoid; dorsal ribs narrowly winged ............................................................................................................................................................. 3. *S. cryptotaenium*


长芩蛇床 chang e liang she chuang

*Ligusticopsis longicalycia* (M. L. Sheh) Pimenov & Kljuykov.

Plants 40–60 cm. Taproot cylindrical, ca. 5 mm thick. Stem erect, grooved, angled, pubescent. Basal leaves petiolate; petioles 10–15 cm, pubescent; blade oblong-ovate, 7–9 × 5–7 cm, 2-pinnate; pinnae 5–6 pairs; ultimate segments lanceolate-ovate, 5–15 × 3–6 mm, veins hispid, margins serrate. Umbels 2.5–5 cm across; peduncles hisrate; bracts absent; rays 11–15, stout, subequal, 1.5–3 cm, hispid; bracteoles numerous, 2-pinnate, hispidulous, equal to or longer than pedicles; umbellules ca. 20-flowered. Calyx teeth linear, 1–2 mm. Petals white. Fruit ovoid, base rounded, apex constricted; dorsal ribs thickened, lateral ribs winged; vittae 3–4 in each furrow, 8 on commissure. Fl. Aug–Sep, fr. Sep. 2n = 22.

Fruits, montane scrub, grassy slopes; 2600–4200 m. SW Sichuan, S Xizang, NW Yunnan [Bhutan, India, Kashmir, Nepal, Pakistan, Sikkim].

This is a mid- to high-elevation Himalayan species distributed from Pakistan to China. Variation in leaf dissection in both this species and the closely related *Selinum candollei* de Candolle is complex and complicates identification, particularly in the C Himalayas. These species are in need of taxonomic revision across their whole geographic range. *Selinum candollei* has not been found in China, but it has been reported to have medicinal properties.


亮蛇床 liang she chuang

*Pleurospermum glaucescens* H. Wolff.

Plants 0.4–2 m, stout. Taproot 2–3 cm thick, branched. Stem erect, striate, branched above. Basal petioles 10–20 cm; sheaths somewhat inflated, 2–7 cm broad, purplish; blade triangular-ovate, 8–10 × ca. 8 cm, ternate-2–3-pinnate, glabrous or scabrid; pinnae 4–8 pairs; ultimate segments oblong-ovate or lanceolate, 10–20 × 5–8 mm. Umbels 8–10 cm across (to 20 cm across in fruit); bracts 12–15, linear, densely hispid, recurved, caducous; rays 12–28(–50), subequal, 5–7 cm, elongating in fruit, hispid; bracteoles 5–10, linear, entire or apex 2–4-lobed, equaling pedicels, recurved. Calyx teeth linear-lanceolate, ca. 1 mm. Petals white or faintly pinkish, pinkish in bud. Styles short when young, ca. 2 × stylodium in fruit. Fruit ovoid, ca. 4 × 3.5–4 mm; dorsal ribs subequal, narrowly winged, lateral ribs broad-winged; vittae 1 in dorsal furrows, 2–3 in lateral furrows, 4–6 on commissure. Fl. Jul–Aug, fr. Sep–Oct.

Montane forests; 2500–4100 m. SW Sichuan, C and NW Yunnan.

The type of *Pleurospermum glaucescens* (Yunnan: Lijiang, J. F. Rock 4481, E) and Wolff’s original description show no membranous margin on the bracteoles, well-developed, linear calyx teeth, and dorsally compressed fruit. These features are uncharacteristic of *Pleurospermum*, and so this species is treated here as a synonym of *Selinum cryptotaenium*.
70. STENOCOELIUM Ledebour, Fl. Altaic. 1: 297. 1829.

狭腔芹属 xia qiang qin shu
Pu Fading (溥发鼎 Pu Fa-ting); Mark F. Watson

Herbs, perennial. Root rather thick. Stem inconspicuous or short-caulescent, base clothed with fibrous remnant sheaths. Basal leaves numerous, rosulate, petiolate, sheathing; blade 2-pinnate. Umbels compound, primary umbel terminal; bracts and bracteoles numerous, linear or linear-lanceolate, with short hairs, margins broadly white-membranous; rays stout, angular; umbellules many-flowered; lateral umbels smaller. Calyx teeth conspicuous, acute-triangular. Petals white, midrib violet, obovate, base cuneate, apex notched with a narrow incurved lobule, pubescent abaxially. Stylopodium short-conical; styles ca. 2 × stylopodium, reflexed. Fruit ovoid, slightly compressed dorsally; ribs thick-obtuse, very prominent, irregularly denticulate especially along ribs, denticles stiff-membranous or with stiffly scarious-processes and hairs; furrows narrow; vittae 1 in each furrow, 2 on commissure. Seed face plane. Carpophore 2-cleft to base.

Three species: high-altitude C Asia and Siberia; two species in China.


1b. Pedicels densely short hairy; fruit covered with stiffly scarious-processes and short hairs along ribs .......... 2.


狭腔芹 xia qiang qin

Plants (8–)15(–20) cm. Stem well developed, usually violet, 3–5-branched, with short stiff hairs. Basal leaves oblong, 3–7 × 1–2.5 cm, 2-pinnate; ultimate segments lanceolate, 3–5 × 1–2 mm. Terminal umbel 8–20 across; bracts 5–7, linear, with short hairs, margins broadly white-membranous; rays 9–28, unequal, 3–10 cm; bracteoles numerous, similar to bracts. Pedicels unequal, subglabrous. Calyx teeth ca. 0.5 mm. Fruit ovoid, 4–5 × ca. 3 mm, sometimes tinged purplish-red, glabrous or with sparse short hairs, ribs irregularly denticulate, denticles stiff-membranous. Fl. and fr. Jul–Aug.

Fibbly slopes, scree, glacial moraines. N Xinjiang (Manas, Toli, Urumqi) [Kazakhstan, Mongolia, Russia (Siberia)].

The Chinese record in FRPS (55(2): 230. 1985) of Stenocoelium athamantoides (Marschall von Bieberstein) Ledebour is referable to this species.


毛果狭腔芹 mao guo xia qiang qin

Seseli trichocarpum (Schrenk) B. Fedtschenko.

Plants 5–10(–20) cm, entirely densely covered in short stiff white hairs. Stem usually inconspicuous, rarely to 7 cm, branched at base. Basal leaves oblong, 2–9 × 1–3 cm, 2-pinnate; ultimate segments oblong-lanceolate, 1–3 × 0.5–1 mm, often violet below. Terminal umbel ca. 10 cm across; peduncle 2–18 cm; bracts numerous, linear-lanceolate, margins broadly white membranous; rays numerous, unequal, 2–5 cm; bracteoles similar to bracts, smaller. Calyx teeth ca. 0.5 mm. Fruit ovoid, 3–5 × 2–3 mm. ribs with stiffly scarious-processes and hairs. Fl. and fr. Jun–Jul.

Fibbly slopes, scree, glacial moraines. Xinjiang (Urumqi) [Kazakhstan].


空棱芹属 kong leng qin shu
Pu Fading (溥发鼎 Pu Fa-ting); Mark F. Watson

Herbs perennial, glabrous. Taproot stout. Stems 1–3, striate, often purplish, more or less curved at nodes, little branched above, base clothed in fibrous remnant sheaths. Basal leaves petiolate, sheathing; diffusely 3–4-pinnate; ultimate segments linear or linear-lanceolate, entire. Synflorescence with a few branches; umbels compound, terminal and lateral; bracts absent or occasionally 1–4, linear; bracteoles several, linear or linear-subulate, ca. equaling pedicels. Calyx teeth obsolete. Petals white, obovate, base cuneate, apex retuse with a small incurved lobule. Stylopodium conic; styles 2 × stylopodium, reflexed. Fruit oblong-ellipsoid, slightly dorsally compressed; ribs prominent, nearly equal, very narrowly winged, hollow; vittae 1 in each furrow, 2 on commissure. Seed face plane, in ripe fruit seeds nearly free, easily separating from pericarp. Carpophore 2-cleft to base.

One species: China, Russia (Siberia); C Asia, SW Asia (Caucasus), Europe.


空棱芹 kong leng qin

Athamanta denudata Fischer ex Hornemann, Suppl. Hort. Bot. Hafn. 32. 1819; Angelica fischeri Sprengel; Cnidium fischeri (Sprengel) Sprengel; Cenolophium fischeri (Sprengel) W. D. J. Koch; Crithmum mediterraneum Marschall von Bieberstein.
Plants 50–150 cm. Basal leaf blade triangular, 10–20 × 8–18 cm; ultimate segments 10–60 × 1–5 mm. Upper leaves smaller, 2-ternate or 3-lobed, sessile on expanded sheaths. Umbels (3–)5–7(–10) cm across; rays 10–25, ca. equal, 3–4(–6) cm; bracteoles 5–7; umbellules 12–16-flowered. Fruit 3.5–5 × 1.5–2.5 mm. Fl. and fr. Jul.–Aug.

Forests, marshes, riparian grasslands; 400–1800 m. Xinjiang [Russia (Siberia); C Asia, SW Asia (Caucasus), Europe].


Ligusticum, here, with the knowledge that many species are very poorly known (often only from a type collection), a conservative, traditional classification has been adopted.

1a. Bracteoles 1–3-pinnate or 2–3-lobed at apex, rarely entire.
2a. Bracteoles 2–3-lobed or 1-pinnate, rarely entire.

3a. Calyx teeth obsolete.
4a. Plants 6–20 cm; leaves 2-pinnate, ultimate segments linear-lanceolate, 2–4 × ca. 1 mm; bracteoles longer than umbellules .......................................................... 33. L. capillaceum
4b. Plants 40–60 cm; leaves ternate-2–3-pinnate, ultimate segments lanceolate, 5–15 × 2–5 mm; bracteoles nearly as long as umbellules .................................................. 34. L. yunnanense

3b. Calyx teeth persistent.
5a. Leaves 1-pinnate.
6a. Bracteoles 4–8(–10), entire or 2–3-lobed at apex, rarely 1-pinnate, margins ciliate; petals white .......... 29. L. likiangense
6b. Bracteoles 10–12, 1-pinnate, pilose; petals white or pinkish tinged ..................................................... 30. L. involucratum
5b. Leaves 2–3-pinnate.
7a. Rays 1.5–2 cm; petals purplish, base cuneate ................................................................. 31. L. franchetii
7b. Rays (1.5–)3–8 cm; petals white, base shortly clawed ......................................................... 32. L. sikiangense

2b. Bracteoles 2–3-pinnate, rarely 1–2-pinnate.
8a. Bracteoles 1–2-pinnate, margins white membranous; calyx teeth obsolete .................................. 35. L. oliverianum
8b. Bracteoles 2–3-pinnate, margins not white membranous; calyx teeth persistent.
9a. Leaves 1–2-pinnate, pinnae ovate, 15–40 × 5–20 mm ........................................................... 36. L. rechingerianum
9b. Leaves 2–4-pinnate, ultimate segments linear to lanceolate, 2–6 × (1–)5 mm.
10a. Plants hispid-setulose throughout; stem simple, usually very short; rays up to 24 cm ...................... 37. L. hispidum
10b. Plants glabrous; stem up to 50 cm; rays 1–6 cm.
11a. Stem unbranched, subscape; cauleine leaves usually absent ............................................. 38. L. scapiforme
11b. Stem usually branched; cauleine leaves present.
12a. Stem single; petals purplish; vittae 1–3 in each furrow, 4–6 on commissure ......................... 39. L. daucoides
12b. Stem multicipital; petals white or violet; vittae 2–5 in each furrow, 6–10 on commissure ........ 40. L. multivittatum

1b. Bracteoles linear or lanceolate, entire.
13a. Ultimate leaf segments narrow, linear, 1–30 × 0.5–3 mm.
14a. Calyx teeth obsolete; ultimate segments of leaf linear to broadly linear, elongate, 5–30 × 1–3 mm. 15a. Leaves 2–3-pinnate; bracteoles longer than umbellules ............................................. 26. L. nematophyllum
15b. Leaves ternate-3–4-pinnate; bracteoles shorter than or nearly as long as umbellules.
16a. Bracteole margin white membranous; vittae 1 in each furrow, 2 on commissure .................. 27. L. tenuissimum
16b. Bracteoles without white membranous margins; vittae 3–5 in each furrow, 6–10 on commissure ..... 28. L. tenuesectum
14b. Calyx teeth persistent; ultimate segments of leaf linear to setuliform, 3–15 × 0.5–1 mm.

Coristospermum Bertoloni; Dystaenia Kitagawa; Ligusticopsis Leute; Paraligusticum V. N. Tikhomirov; Rupiphila Pimenov & Lavrova; Tilingia Regel & Tiling.

Ligusticum is a widespread, complex genus the taxonomy of which is in a state of flux. Relationships with nearby genera such as Cnidium, Hymenidium, Ligusticopsis, Pachypleurum, Paraligusticum, Rupiphila, Selinum, and Tilingia are still being clarified. As a general consensus has yet to be reached, and many species are very poorly known (often only from a type collection), a conservative, traditional classification has been adopted here, with the knowledge that Ligusticum in the broad sense is an artificial assemblage.

About 60 species: Asia, Europe, North America; 40 species (35 endemic) in China.
17a. Bracteoles without narrow membranous margin.
18a. Calyx teeth conspicuous, subulate; leaves 3–4-pinnate .............................................. 24. *L. brachylobum*
18b. Calyx teeth inconspicuous, minute; leaves ternate-2–3-pinnate ................................. 25. *L. mairei*

17b. Bracteoles with narrow membranous margin.
19a. Plants 10–30 cm; umbels 2–4 cm across; petal bases shortly clawed (N China) .......... 21. *L. tachiroei*
19b. Plants 30–120 cm; umbels (3–)5–10 cm across; petal bases cuneate (SC and WC China).
20a. Ultimate leaf segments linear, 3–10 × 1–2 mm; vittae 1 in each furrow ..................... 22. *L. striatum*
20b. Ultimate leaf segments setuliform, 1–5 × ca. 0.5 mm; vittae 3 in each furrow ........ 23. *L. delavayi*

13b. Ultimate leaf segments broad, ovate or lanceolate, 5–50 × 5–30 mm.

21a. Leaves 1-pinnate.
22a. Umbels terminal; rays elongate, 10–17 cm; petals purple ........................................ 1. *L. yanyuanense*
22b. Umbels terminal and lateral; rays short, 1.5–3 cm; petals white.
23a. Vittae 1–2 in each furrow, 4 on commissure (Xinjiang) ........................................... 2. *L. mucronatum*
23b. Vittae 2–4 in each furrow, 6–8(–10) on commissure (NC, SC, and WC China) ......... 3. *L. thomsonii*

21b. Leaves 1–3-pinnate or ternate-2–4-pinnate.

24a. Calyx teeth persistent.
25a. Bracteoles margin narrow membranous ................................................................. 4. *L. gyirongense*
25b. Bracteoles without narrow membranous margin.

26a. Plant pubescent throughout; leaves 1–2-pinnate ..................................................... 5. *L. xizangense*
26b. Plant subglabrous; leaves ternate-2–3-pinnate.
27a. Petal apex mucronate without incurved lobule ...................................................... 17. *L. weberbauerianum*
27b. Petal apex notched with incurved lobule.
28a. Rays 15–20; seed face slightly concave (Xizang) .................................................... 6. *L. littledalei*
28b. Rays 7–11; seed face plane (E and NE China) ...................................................... 7. *L. ajanense*

24b. Calyx teeth obsolete.

29a. Rootstock apparently swollen at nodes; styles longer than or ca. 0.5 × fruit.
30a. Internodes of rootstock short; rays 15–30, 3–5 cm; petal base cuneate; styles ca. equaling fruit (or plants not flowering) ........................................................ 8. *L. sinense*
30b. Internodes of rootstock slender; rays 10–14, 1.5–2 cm; petal base short-clawed; styles ca. 0.5 × fruit .... 9. *L. reptans*

29b. Rootstock not swollen at nodes; styles usually less than 0.5 × fruit.

31a. Rays extremely unequal.
32a. Plants 30–50 cm; rays 5–8, 1–3 cm ................................................................. 10. *L. litigense*
32b. Plants 100–150 cm or more; rays (10–)20–50.
33a. Rays (10–)20–25, 1–6 cm; petals purple (NC and SW China) ...................................... 11. *L. angelicifolium*
33b. Rays 30–50, 3–12 cm; petals white (Xinjiang) ....................................................... 12. *L. discolor*

31b. Rays slightly unequal to subequal.

34a. Bract margins narrow membranous (NE and NW China) ...................................... 14. *L. jeholense*
34b. Bracts without narrow membranous margin (NC, SC, and WC China).

35a. Umbels 15–20 cm across; rays 4–8(–15) cm .......................................................... 13. *L. kingdon-wardii*
35b. Umbels 5–10 cm across; rays 2–4 cm.
36a. Rays 8–10; pinnae abaxial glaucous ............................................................... 15. *L. glaucifolium*
36b. Rays (7–)12–25(–40); pinnae abaxial pale green.
37a. Leaves 1–3-pinnate; bracts 1–4 (Xizang) ......................................................... 16. *L. elatum*
37b. Leaves ternate-3-pinnate; bracts 5–10, sometimes caducous (NC and SC China).
38a. Rootstock slender; secondary pinnae 3–5 pairs, remote; terminal pinnae acute ...... 18. *L. pteridophyllum*
38b. Rootstock thick; secondary pinnae 8–10 pairs, crowded; terminal pinnae caducate.
39a. Fruit oblong-oval, ca. 3 × 2 mm; vittae 2–3(–4) in each furrow, 6–8 on commissure ........................................................................................................ 19. *L. acuminatum*
39b. Fruit oblong-obovate, ca. 4 mm long; vittae absent .................................................. 20. *L. nullivittatum*


**盐源藁本 yan yuan gao ben**

Plants ca. 30 cm, glabrous. Rootstock cylindrical, 3–5 × ca. 5 mm, little-branched. Basal and lower leaves petiolate; petioles 2–4 cm; sheaths ovate; blade lanceolate, 6–8 × 2–4 cm, 1-pinnate, pinnae 5–6 pairs, remote, ovate to lanceolate; proximal pinnae usually 2-lobed, 1–2 × 0.5–1.5 cm, margins serrate. Umbels terminal, 10–25 cm across; bracts absent; rays 6–8, stout, unequal, 10–17 cm; bracteoles 5–7, oblanceolate, unequal, ca. equal to pedicels, entire; umbellules 10–15–flowered. Calyx teeth obsolete. Petals purple, obovate, base cuneate. Stylodium conic; styles 2–5 × stylodium. Fruit oblong-ovoid, ca. 3 × 2 mm; dorsal and intermediate ribs filiform, lateral ribs narrowly winged; vittae 2 in each furrow, 4 on commissure. Seed face plane. Fl. Jun–Jul, fr. Jul–Aug.

- Alpine scrub, meadows; ca. 3800 m. SW Sichuan (Yanyuan).

短尖藁本  duan jian gao ben

*Neogaya mucronata* Schrenk in Fischer & C. A. Meyer, Enum. Pl. Nov. 2: 40. 1842; *Libanotis dolichostyla* Schischkin; *L. sub simplex* Popov; *Pachyleurum dolichostylum* (Schischkin) Korovin ex Kamelin; *P. mucronatum* (Schrenk) Schischkin; *Seseli dolichostylum* (Schischkin) M. Hiroe; *S. mucronatum* (Schrenk) Pimenov & Sdobchina.

Plants 15–80 cm. Rootstock cylindrical. Stems single or multicellular, base densely clothed with fibrous remnant sheaths. Basal leaves petiolate; petioles 4–15 cm; blade oblong, 5–12 × 1.5–5 cm, 1-pinnate; pinnae 5–7 pairs, oblong-ovate, 1–4 × 0.5–1.5 cm, shallowly to deeply 3–5-lobed, striogoise on veins and margins. Cauline leaves few, much reduced. Umbels terminal and lateral, 2–7 cm across; bracts few, linear, margins narrowly white membranous, usually caducous; rays 15–32, 1.5–3 cm; bracteoles 5–10, linear-lanceolate, margins white membranous. Calyx teeth minute, triangular. Petals white obovate, base cuneate. Styles ca. 1/3 × fruit. Fruit oblong-ovoid, ca. 3 × 1.5–2 mm; dorsal and intermediate ribs prominent, lateral ribs narrowly winged; vittae 1–2 in each furrow, 4 on commissure. Seed face plane. Fl. Jul–Aug, fr. Sep–Oct.

Wooded valleys, grassy slopes; 1700–3300 m. N Xinjiang [Kazakhstan, Kyrgyzstan, Russia].


长茎藁本  chang jing gao ben

*Ligusticum thomsonii* var. *evolutius* C. B. Clarke; *Pleurosporum longicaule* H. Wolff.

Plants 20–90(–150) cm, subglabrous. Rootstock cylindrical, 5–15 × 1–2 cm. Stems multicellular, striate, base densely clothed with fibrous remnant sheaths. Basal leaves petiolate; petioles 2–10 cm; blade narrowly oblong, 2–12 × 1–3 cm, 1-pinnate (rarely 2-pinnate); pinnae 5–9 pairs, ovate or oblong, 5–20 × 5–10 mm, veins sparsely pubescent, margins irregularly serrate to deeply lobed. Cauline leaves 1–3, reduced upward becoming sessile. Terminal umbels 4–6 cm across, lateral umbels smaller, sometimes staminiate; bracts 5–6(–8), linear, margins white membranous; rays 10–20, 1–2.5 cm; bracteoles 10–15, linear to linear-lanceolate, margins white membranous. Calyx teeth minute, triangular. Petals white ovate, base cuneate. Styles reflexed. Fruit oblong-ovoid, 3.5–5 × 2–3 mm; dorsal and intermediate ribs prominent, lateral ribs narrowly winged; vittae 2–4 in each furrow, 6–8(–10) on commissure. Seed face plane. Fl. Jul–Aug, fr. Sep–Oct. 2n = 22*.

Margins of coniferous forests, grassy valley slopes, alpine scrub and meadows; 2200–4200 m. Gansu, SE Qinghai, W Sichuan, Xizang, NW Yunnan [Afghanistan, NW India, Kashmir, Pakistan].

This species has reputed medicinal value (in SW China).


吉隆藁本  ji long gao ben

Plants 30–50 cm, glabrous. Root cylindrical. Stem single, striate, base clothed in fibrous remnant sheaths. Basal leaves petiolate; petioles 5–12 cm; blade broadly ovate, 6–10 × 7–9 cm, 2-pinnate; primary pinnae 4–5 pairs, remote; ultimate segments ovate or broadly ovate, 10–15 × 5–10 mm, margins shallowly 3-lobed to pinnatifid. Cauline leaves few, gradually reduced upwards. Umbels ca. 5 cm across in fruit; bracts 5, linear to lanceolate, margins narrowly membranous; rays ca. 12, 2–2.5 cm; bracteoles 5–8, similar to bracts; umbellules 10–15-flowered. Calyx teeth conspicuous, triangular, ca. 1 mm. Petals white obovate. Styles reflexed. Fruit oblong-ovoid, ca. 3 × 1.5 mm; ribs prominent, subequal; vittae 1–2 in each furrow, 2–4 on commissure. Seed face plane or slightly concave. Fl. Jul–Sep, fr. Oct–Nov.

- Grassland at forest margins; 2500–3000 m. S Xizang (Gyirong), NW Yunnan (Eryuan).


西藏藁本  xi zang gao ben

Plants 15–25 cm, pubescent throughout. Taproot thick, branched. Stems multicellular, purplish and striate, base clothed with fibrous remnant sheaths. Basal leaves numerous, short petiolate; sheaths purplish; blade narrow-oblong, 3.5–6 × 1.5–3 cm, 1–2-pinnate; pinnae 2–4 pairs, ovate to broad-ovate, 4–8 × 3–6 mm, margins pinnatifid. Cauline leaves 1–2, similar to basal, smaller. Umbels terminal, 2–3 cm across; peduncles stout, 6–10 cm; bracts 1–2, linear, 1.5–2.5 cm, rarely 2–3-lobed at the apex; rays 15–25, slightly unequal, 1.2–2 cm; bracteoles 10–12, linear, margin not membranous; umbellules 20–30-flowered. Calyx teeth conspicuous, subulate unequal. Petals white, obovate, base shortly clawed. Styles ca. 2–3 × stylopodium, reflexed. Fruit oblong-ovoid, 3.4 × 2.5–3 mm; dorsal and intermediate ribs filiform, lateral ribs narrowly winged; vittae 3 in each furrow, 5–6 on commissure. Fl. and fr. Aug–Oct.

- Alpine meadows; ca. 4500 m. SE Xizang (Nyingchi).


利特藁本  li te gao ben

Plants 30–50 cm, subglabrous. Root cylindrical. Stem erect, striate, 2–3-branched, base clothed in fibrous remnant sheaths. Basal and lower leaves petiolate; petioles 10–15 cm; blade triangular, 8–12 × 6–10 cm, ternate-3-pinnate, primary pinnae 5–7 pairs; ultimate segments ovate or ovate-lanceolate, 10–25 × 5–15 mm, margins irregularly serrate. Upper leaves smaller, 2-pinnate. Umbels terminal and lateral, 4–5 cm across; peduncles 15–20 cm; bracts absent or occasionally 1, linear; rays 15–20, subequal, 1–3 cm; bracteoles numerous, linear and hispid, margin not membranous. Calyx teeth conspicuous, triangular. Petals white, obovate or oblong-ovate, base cuneate. Styles ca. equal to stylopodium. Fruit ovoid; dorsal and intermediate ribs prominent, lateral ribs narrowly winged; vittae 3–4 in each furrow, 8 on commissure. Seed face slightly concave. Fl. Jul, fr. Aug.

- *Abies* and *Picea* forests; above 3000 m. C and SE Xizang.

黑水岩茴香  he shui yan hui xiang

*Tilingia ajanensis* Regel & Tiling, Fl. Ajan. 97. 1858; *Cnidium ajanense* (Regel & Tiling) Drude; *Selenium tilingia* Maximowicz, nom. illeg. superfl.; *Cnidium tilingia* (Maximowicz) Takeda.

Plants 50–80 cm, essentially glabrous (rays puberulent). Root cylindrical, thick. Stem single or multicipital, purplish, striate and branched, base clothed in fibrous remnant sheaths. Basal leaves petiolate; petioles 5–10 cm; blade triangular-ovate, 8–10 × 5–8 cm, ternate-2–3-pinnate, primary pinnae 4–6 pairs; ultimate segments oblong-ovate. Upper leaves ternate-1-pinnate, or 3-lobed, segments linear. Umbels terminal and lateral, 2.5–4 cm across; peduncles 3–15 cm; bracts 1–5, linear or absent; rays 5–11, unequal, 1–3 cm; bracteoles 3–5(–8), linear; umbellules 10–15-flowered. Calyx teeth conspicuous, triangular-lanceolate. Petals white or pinkish, base shortly clawed. Umbels terminal and lateral, 6–8 cm across in fruit; bracts 5–6(–10), linear; rays 1–3 in each furrow, 2(–4)–6 on commissure. Seed face plane. Fl. Jul–Aug, fr. Aug–Oct.

8. **Ligusticum sinense** Oliver, Hooker’s Icon. Pl. 20: t. 1958. 1891.

藁本  gao ben

Plants 0.5–1 m tall. Rootstock thick, apparently swollen at nodes, internodes short. Stem single, erect, striate and branched. Basal petioles 10–20 cm; blade triangular-ovate, 15–20 × 10–15 cm, ternate to 1- or 2-pinnate, primary pinna 4–6 pairs, proximal segments ovate or oblong-ovate, 2–3 × 1–2 cm, margins irregularly serrate. Cauline leaves similar to basal, reduced, sessile, 1-pinnate. Umbels terminal and lateral, 6–8 cm across in fruit; bracts 5–6(–10), linear; rays 15–30, subequal, 3–5 cm; bracteoles 5–8, linear, shorter than pedicels, reflexed. Calyx teeth obsolete. Petals white, obovate, base cuneate. Styles ca. equaling fruit, reflexed. Fruit oblong-ovoid, 3–4 × 2–3 mm; ribs prominent, subequal; vittae 1–3 in each furrow, 2(–4)–6 on commissure. Seed face plane. Fl. Jul–Aug, fr. Aug–Oct.

Pebbly slopes, grasslands. Hebei, Heilongjiang, Jilin, Shandong [Japan, Russia (Siberia)].

8a. **Ligusticum ajanense** var. *sinense* 藁本 (原变种) gao ben (yuan bian zhong)

*Ligusticum harrysmitthii* M. Hiroe; *L. markgrafianum* Fedde ex H. Wolff; *L. pilgerianum* Fedde ex H. Wolff; *L. silvaticum* H. Wolff.

Plants freely flowering and setting seed. Rootstock slightly swollen at nodes. Leaves ternate to 3-pinnate; ultimate segments irregularly serrate. Dorsal and intermediate fruit ribs prominent, filiform, lateral ribs narrowly winged.

- Forests, grassy slopes, streamsides, also cultivated; 500–2700 m. S part of Huang He basin.

Neither *Ligusticum markgrafianum*, described from Hubei (*J. F. Rock 14590, isotype, E) nor *L. pilgerianum* Fedde ex H. Wolff (Repert. Spec. Nov Regni Veg. 27: 322. 1930, not H. Wolff, loc. cit. 307. 1930; *L. harrysmitthii*), described from Gansu (*J. F. Rock 14590, syntype) and Shanxi (*H. Smith 7112, syntype) can be separated from *L. sinense* var. *sinense*, so we here treat them in synonymy.

This is an important plant of traditional Chinese medicine, in which the roots and rootstock are used in “gao ben” (see also *Ligusticum jeholense*); a common herb used as an analgesic and anti-inflammatory, in the treatment of heart diseases and asthma. The seedlings are also eaten as a vegetable.


金芎 jin xiong

Plants usually flowering and setting seed. Rootstock tuberous. Ultimate leaf segments incised. Fruit ribs all prominent, filiform, subequal, wingless. 2n = 33*.

- Montane scrub, grassy slopes, also cultivated; 800–3100 m. Guizhou, Shaanxi, Sichuan, Yunnan.

This taxon is closely allied to var. *sinense* but is triploid.


水藁本 shui gao ben

Plants usually flowering and setting seed. Rootstock swollen at nodes or tuberous. Plants never or very rarely flowering or setting seed. Rootstock swollen at nodes or tuberous; plants usually flowering and setting seed.

1a. Ultimate leaf segments incised to lacinate or pinnatifid; rootstock a thick tuber; plants never or very rarely flowering or setting seed.

2a. Ultimate leaf segments incised to lacinate

.......................................................... 8d. ‘Fuxiong’

2b. Ultimate leaf segments pinnatifid

.......................................................... 8e. ‘Chuanxiong’

1b. Ultimate leaf segments irregularly serrate; rootstock swollen at nodes or tuberous; plants usually flowering and setting seed.

3a. Fruit ribs all narrowly winged, subequal

.......................................................... 8c. var. *hupehense*

3b. Fruit ribs prominent, or only lateral ribs narrowly winged.

4a. Dorsal and intermediate fruit ribs prominent, filiform, lateral ribs narrowly winged; rootstock slightly swollen at nodes

................................. 8a. var. *sinense*

4b. Fruit ribs all prominent, filiform, subequal, wingless; rootstock tuberous

................................. 8b. ‘Jinxiong’
This taxon is used medicinally in Hubei as “shui gao ben,” a regional substitute for “gao ben.”


**Fuxiong**

Plants very rarely flowering or setting seed. Rootstock a thick tuber. Ultimate leaf segments pinnatifid. $2n = 33^*$.  
- Cultivated. Hubei, Jiangxi, Sichuan.


**Chuanxiong**

Plants never flowering or setting seed. Rootstock a thick tuber. Ultimate leaf segments incised to laciniate. $2n = 22^*$.  

This cultivar was historically used medicinally in Sichuan as “mi wu,” but nowadays it has fallen from use.


**Pu fu gao ben**


Plants ca. 30 cm. Rootstock slender creeping, apparently swollen at nodes, internodes elongated. Stem single, striate. Basal petioles 5–9 cm; blade triangular-ovate, 3–6 × 2–5 cm, ternate-2-pinnate; ultimate segments ovate or ovate-lanceolate, 10–20 × 8–15 mm, margins 3–5-lobed. Upper leaves sessile, 1-pinnate. Umbels terminal, 3–4 cm across; lateral umbels smaller, usually stamine; bracts 5–6, linear, reflexed; rays 10–14, 1.5–2 cm; bracteoles 5–6, linear, reflexed. Calyx teeth obsolete. Petals white, obovate, base shortly clawed. Styles ca. 0.5 × 1.5 cm, woody. Stem erect, striate, hollowed and branching, base densely covered in fibrous remnant sheaths. Lower leaves petiolate; petioles 8–12 cm; blade triangular-ovate, 15–30 × 20–40 cm, ternate-3-pinnate; ultimate segments oblong-ovate, 2.5–5 × 1–3 cm, margins serrate. Upper leaves very reduced. Umbels 5–7 cm across, terminal and lateral, base of umbels densely yellow hispid; bracts absent; rays (10–)20–25, extremely unequal, 1–6 cm; bracteoles few, linear, ca. 10 mm. Calyx teeth obsolete. Petals purple. Styles ca. 2 × stylodium, reflexed. Fruit oblong-ovoid, 4–5 × 2.5–3 mm; dorsal and intermediate ribs prominent, filiform, lateral ribs winged; vittae 3–4 in each furrow, 4–6(–8) on commissure. Seed face plane. Fl. Jul–Aug, fr. Sep–Oct.  
- Grassland at forest margins, scrub at streamsides, alpine meadows; 1800–4200 m. Shaanxi, W Sichuan, SE Xizang, W Yunnan.

This species has reputed medicinal value.


**Li tang gao ben**

*Pleurospermum discolor* (Ledebour) M. Hiroe; *Parali gusticum discolor* (Ledebour) V. N. Tikhomirov

Plants 0.6–2 m, stout. Rootstock cylindrical. Stem single, erect, striate, hollowed and branching, base densely covered in fibrous remnant sheaths. Lower leaf petioles 20–40 cm; blade triangular-ovate, 30–35 × 20–25 cm, ternate-3-pinnate; ultimate segments ovate or oblong-ovate, 2–4 × 1–1.5 cm, puberulent on the veins, abaxially olivaceous, purplish. Upper leaves much reduced. Umbels 5–10 cm across, terminal and lateral; peduncle 20–40 cm, base of umbels densely pubescent; bracts 5–8, linear, 5–20 mm; rays 30–50, extremely unequal, 3–12 cm; bracteoles numerous, linear, 4–6 mm, shorter than umbellules. Calyx teeth obsolete. Petals white, ovate. Fruit oblong-ovoid, ca. 4 × 2.5 mm; dorsal and intermediate ribs filiform, lateral ribs narrowly winged; vittae 3–4 in each furrow, 8–10 on commissure. Seed face plane. Fl. and fr. Jul–Aug, fr. Sep–Oct.  
- Grassy slopes, moist rock surfaces; 2000–2200 m. NE Guizhou (Fanjing Shan), Chongqing (Nanchuan).


**Li tang gao ben**

Plants 30–50 cm. Root fusiform. Stem erect purplish. Leaves petiolate; blade triangular-ovate, ternate-2-pinnate, primary pinnate 3–4 pairs; ultimate segments ovate, 10–20 × 5–10 mm, margins serrate. Upper leaves reduced, sessile, 1-pinnate or 3-lobed; ultimate segments lanceolate. Umbels 3–3.5 cm, terminal and lateral; bracts absent; rays 5–8, extremely unequal, 1–3 cm; bracteoles 2–5, linear, shorter than umbellules, ca. 5 mm. Calyx teeth obsolete. Petals white, obovate, base cuneate. Styles ca. equaling stylodium. Fruit oblong-ovoid, ca. 4 × 3 mm; ribs narrowly winged, lateral ribs slightly broader than dorsal and intermediate ribs; vittae 2–3 in each furrow, 4–6 on commissure. Seed face slightly concave. Fl. Jul–Aug, fr. Sep–Oct.

- Alpine scrub and meadows; ca. 4300 m. W Sichuan (Litang).

This rather poorly known taxon is recorded only from a few collections.


**Fu Xiong**

*Ligusticopsis angelicifolia* (Franchet) Leute; *Angelica angelicifolia* (Franchet) Kljuykov.

Plants 1–1.5 m or more. Root cylindrical. Stem erect, striate and branched. Lower leaves petiolate; petioles 8–12 cm; blade triangular-ovate, 15–30 × 20–40 cm, ternate-3-pinnate; ultimate segments oblong-ovate, 2.5–5 × 1–3 cm, margins serrate. Upper leaves very reduced. Umbels 5–7 cm across, terminal and lateral, base of umbels densely yellow hispid; bracts absent; rays (10–)20–25, extremely unequal, 1–6 cm; bracteoles few, linear, ca. 10 mm. Calyx teeth obsolete. Petals purple. Styles ca. 2 × stylodium, reflexed. Fruit oblong-ovoid, 4–5 × 2.5–3 mm; dorsal and intermediate ribs prominent, filiform, lateral ribs winged; vittae 3–4 in each furrow, 4–6(–8) on commissure. Seed face plane. Fl. Jul–Aug, fr. Sep–Oct.

- Grassland at forest margins, trees at streamsides, alpine meadows; 1800–4200 m. Shaanxi, W Sichuan, SE Xizang, W Yunnan.

This species has reputed medicinal value.


**Cao dian gao ben**

Plants 0.8–2 m, stout. Root fusiform elongate, 20–30 × ca. 1.5 cm, woody. Stem single, erect, purplish fistulat, striate,
branching, base covered in fibrous remnant sheaths. Basal and lower petioles 15–30 cm; blade deltoid-ovate, ca. 30 × 20 cm, ternate-3-pinnate, primary pinnate 5–6 pairs; ultimate segments lanceolate, 20–30 × 5–10 mm, margins pinnatifid. Upper leaves reduced to bladeless sheaths. Umbels terminal, 15–20 cm across, lateral umbels smaller; bracts 6–12, linear; rays 25–35(–45), slightly unequal, 4–8(–15) cm; bracteoles 8–10, linear, entire, rarely 2–3-lobed at apex, slightly exceeding umbellules, margins pubescent. Calyx teeth obsolete. Petals white obovate, base cuneate. Styles ca. equaling stylodium. Fruit oblong-ovoid, 4–5 × ca. 3 mm; dorsal and intermediate ribs filiform, lateral ribs narrowly winged; vittae 3–4 in each furrow, 6 on commissure. Fl. and fr. Aug–Oct.

- Wooded valleys, alpine meadows; 3000–3300 m. SW Sichuan, N Yunnan.


*辽藁本* liao gao ben


Plants 30–80 cm. Root fusiform; rootstock short. Stem erect, purplish striate, branching. Lower petioles 10–19 cm; blade broad-ovate, 10–20 × 8–16 cm, ternate-2–3-pinnate, primary pinnate 4–6 pairs; ultimate segments ovate, 2–3 × 1–2 cm, hispid on veins, margins 3–5-lobed. Upper leaves reduced. Umbels terminal and lateral, 3–7 cm across; bracts 1–2, linear, scabrid, margins narrow membranous, caducous; rays 8–16, subequal, 2–3 cm; bracteoles 8–10, linear, longer than umbellules in flower, and subequal to pedicels in fruit. Calyx teeth obsolete. Petals white, oblong-ovoid. Styles ca. 0.5 × fruit, reflexed. Fruit oblong, 3–4 × 2–2.5 mm; dorsal and intermediate ribs filiform, lateral ribs narrowly winged; vittae 1–2 in each furrow, 2–4 on commissure. Seed face plane. Fl. Aug–Sep, fr. Sep–Oct.

- Forests, meadows, streamsides, damp places; 1200–2500 m. Hebei, Jilin, Liaoning, Shandong, Shanxi.

The roots and rootstock are used as “liao gao ben” (see also *Ligusticum sinense* “gao ben”), an important, analgesic and anti-inflammatory herb of traditional Chinese medicine.


*白叶藁本* bai ye gao ben

Plants 40–60 cm, glabrous. Root cylindrical. Stem single, erect, striate, 2–3-branched. Basal leaves ovate or broad-ovate, 15–20 × 5–15 cm, 1–2-pinnate, pinnae 3–6 pairs; ultimate segments ovate or rhombic, 10–20 × 5–20 mm, abaxial glaucocent, margins serrate. Upper leaves similar to the basal, reduced, sessile on expanded sheaths. Umbels terminal and lateral, 3–5 cm across; bracts 2–4, linear, or absent; rays 8–10, subequal, 2–3 cm; bracteoles 6–8, linear, ca. equaling umbellules in flower; umbellules many-flowered; pedicels subequal. Calyx teeth obsolete. Petals purple, obovate, base cuneate. Styles divergent, equaling stylodium. Fruit oblong-ovoid, 4–5 × 3–3.5 mm; ribs narrowly winged, subequal. Fl. and fr. Aug–Oct. 2n = 22*.

- Shady forests, pebbly slopes, stream banks; 3000–3300 m. W Yunnan.

This rather poorly known species is recorded only from a few collections.


*高升藁本* gao sheng gao ben


Forest margins; ca. 3600 m. Xizang [Afghanistan, Bhutan, NW India, ?Nepal, Pakistan].


*尖瓣藁本* jian ban gao ben

*Notopterygium weberbauerianum* (Fedde ex H. Wolff) Pimenov & Kljuykov.

Plants ca. 70 cm tall, glabrous. Root cylindrical. Stem single, striate, 2–3-branched. Basal petioles 5–10 cm; blade triangular-ovate, 20–25 × 15–25 cm, ternate-3-pinnate, primary pinnae 5–6 pairs; ultimate segments ovate-lanceolate, 2–2.5 × 0.5–1 cm, margins pinnatifid. Cauleine leaves few, reduced. Terminal umbels 4–6 cm across, lateral umbels smaller; bracts 1–2, linear, or absent; rays 12–20, slender, subequal, 4–5 cm; bracteoles 5, linear, shorter than pedicels; umbellules many-flowered. Calyx teeth conspicuous, triangular. Petals white, oblong-ovate, base cuneate, apex mucronate. Styles ca. 2 × stylodium. Immature fruit oblong-ovoid (mature fruit not known). Fl. and fr. Jul–Sep.

- Forests; ca. 3300 m. C Gansu.

Recent research has suggested that this poorly known species and *Ligusticum pilgerianum* H. Wolff (Repert. Spec. Nov Regni Veg. 27: 307. 1930, not Fedde ex H. Wolff, loc. cit. 322. 1930) are conspecific with *Notopterygium insumum*. Certainly the petal shape is unusual in *Ligusticum*, but further work is needed to confirm these findings; if upheld the name *N. weberbauerianum* should be applied to the taxon. *Ligusticum pilgerianum* H. Wolff was described from Sichuan, and is
Plants 30–80 cm, glabrous. Rootstock swollen at nodes, small globose, internodes slender. Stem erect, striate and hol- lowed. Basal and lower petioles 15–20 cm; blade ovate, 15–20 × 10–15 cm, ternate-2–3-pinnate, primary pinnae 5–7 pairs, remote; ultimate segments obovate or flabelliform, ca. 10 × 5 mm, acute at apex, margins crenate. Upper leaves reduced. Umbels terminal and lateral, 5–7 cm across; bracts 8–10, linear; rays 13–20, subequal, 2–3 cm; bracteoles 6–10(–12), linear. Calyx teeth obsolete. Petals white or purplish tinged, base cuneate. Fruit oblong, ca. 5 × 3 mm, dorsal and intermediate ribs prominent, lateral ribs narrowly winged; vittae 3 in each furrow, 4–6 on commissure. Seed face plane. Fl. Aug–Sep, fr. Sep–Oct. 2n = 44*.

- Forests, grassy slopes, streamsides, rock crevices; 1800–3600 m. S Gansu, W Sichuan, E Xizang, Yunnan.

This species is used in NW Yunnan (Dali area) as a regional substitute, known as “hei gao ben,” for the traditional Chinese medicine “gao ben” (see Ligusticum sinense and L. jebolese).


岩茴香 yan hui xiang


Plants 10–30 cm tall, slender, glabrous. Root cylindrical. Stem single or multicellular, little-branched or unbranched. Basal petioles 5–7(–12) cm; blade ovate, 5–10 × 5–7 cm, 3-pinnate, primary pinnae 5–7 pairs; ultimate segments linear, 3–15 × 0.5–1 mm. Cauline leaves similar to basal, reduced. Umbels terminal and lateral, 2–4 cm across; bracts 2–7, lanceolate, margins white membranous, usually caducous; rays 5–10, unequal, 5–15(–40) mm; bracteoles 5–8, similar to bracts, ca. equaling pedicels. Calyx teeth conspicuous, lanceolate, ca. 0.5 mm. Petals white, obovate, base cuneate. Styles ca. 2 × stylodium. Fruit oblong-ovoid. Fruit oblong-ovoid, ca. 3 × 2 mm; dorsal and intermediate ribs narrowly winged, lateral ribs more broadly winged; vittae 2–3(–4) in each furrow, 6–8 on commissure. Seed face plane or slightly concave. Fl. Jul–Aug, fr. Sep–Oct. 2n = 22*.

- Forests, forest margins, alpine scrub and meadows; 1500–4000 m. Hebei, Henan, Jilin, Liaoning, Shanxi [Japan, Korea, Mongolia].

Pebbley slopes, damp river banks, rock crevices; 1200–2500 m. Hebei, Henan, Jilin, Liaoning, Shanxi [Japan, Korea, Mongolia].

22. Ligusticum striatum de Candolle, Prodr. 4: 158. 1830.

条纹藁本 tiao wen gao ben

Cortia striata (de Candolle) Leute; Ligusticum wallachii Franchet, nom. illeg. superfl.; Oreocome striata (de Candolle) Pimenov & Kljuykov; Selinum striatum (de Candolle) Bentham & J. D. Hooker (1867); S. striatum Bentham ex C. B. Clarke (1879).

Plants 30–120 cm. Stem erect, branching, glabrous. Lower leaves petiolate; blade triangular-ovate, ternate-2–3-pinnate, secondary pinnae usually 8–10 pairs, crowded, terminal pinnae caduate; ultimate segments ovate or lanceolate, 5–22 mm, much incised or shallowly pinnatifid. Umbels 6–9 cm across; peduncles 5–11 cm, strigose; bracts caducous; rays ca. 30, 2–3.5 cm, subequal, scabrous; bracteoles 8–10, linear, exceeding pedicels; umbellules 20–30-flowered. Calyx teeth obsolete. Petals white, obovate-cordate. Fruit oblong-ovate, ca. 4 cm, dorsal and intermediate ribs narrowly winged, lateral ribs broadly winged; vittae absent. Fl. Aug–Sep, fr. Sep–Oct.

- Sparse forests, scrub, moist land; 1400–2400 m. W Hubei, S Shaanxi, Sichuan.

This is an incompletely known species.
umbels 5–7 cm across, lateral umbels smaller; bracts 4–6, linear; rays 8–14, unequal, 2–4 cm; bracteoles 4–8, linear, ca. equaling pedicels, margins narrowly white membranous. Calyx teeth lanceolate, ca. 0.6 mm. Petals white, obovate, base cuneate. Fruit oblong-ovoid, 3.5–4 × 3–3.5 mm; ribs prominent, subequal; vittae 1 in each furrow, 2 on commissure. Seed face plane. Fl. and fr. Jul–Sep.

Shady slopes in forests; 1500–3700 m. NW Yunnan (Heqing) [NW India, Kashmir, Nepal].


丽江藁本 li jiāng gāo běn

*Hymenidium delavayi* (Franchet) Pimenov & Kljuykov.

Plants 30–80 cm, glabrous. Root cylindrical, up to 10 cm. Stem single or multicipital, little-branched above. Basal and lower petioles 6–25 cm; blade oblong-ovate or lanceolate, 5–15 × 2–10 cm, 2–3-pinnate, primary pinnae 6–8 pairs; ultimate segments setuliform, 1–5 × ca. 0.5 mm. Upper leaves reduced, sessile, 1–2-pinnate. Umbels terminal and lateral, 3–10 cm across; bracts 1–4, linear-lanceolate, 5–15 mm, with white membranous margins; rays (6–)10–14, subequal, 3–4 cm; bracteoles 8–10, lanceolate, 5–8 mm, narrowly membranous margined. Calyx teeth conspicuous, subulate, ca. 0.5 mm, unequal. Petals white, obovate, base cuneate. Fruit oblong-ovoid, ca. 4 × 3 mm; dorsal and intermediate ribs raised, lateral ribs narrowly winged; vittae 3 in each furrow, 6 on commissure. Seed face plane. Fl. Aug–Sep, fr. Sep–Oct. 2n = 22*.

● Montane thickets, alpine pastures; 2800–4500 m. S Xizang, NW Yunnan.

This species has reputed medicinal value.


短片藁本 duān piān gāo běn

*Ligusticopsis brachyloba* (Franchet) Leute; *Peucedanum cavaleriei* H. Wolff.

Plants to 1 m tall, stout, puberulent throughout. Root fusiform. Stem erect, striate, hollow, branching, base clothed in fibrous remnant sheaths. Basal petioles 9–25 cm; blade triangular-ovate, 10–20 × 8–18 cm, 3–4-pinnate; ultimate segments linear, ca. 3 × 1 mm. Upper leaves reduced, sessile. Umbels terminal and lateral, terminal umbels 4–6 cm across; bracts 2–4 or absent; rays 15–30, 2–6 cm, scabrid; bracteoles 10–12, linear, densely pubescent, without white membranous margin. Calyx teeth conspicuous, subulate, ca. 0.5 mm. Petals white, broad-ovate, base cuneate. Fruit oblong-ovoid, ca. 5 × 4 mm; dorsal and intermediate ribs raised, lateral ribs narrowly winged; vittae 2–3 in each furrow, 4–6 on commissure. Seed face plane. Fl. Jul–Aug, fr. Sep–Oct. 2n = 22*.

● Forest margins, alpine scrub and meadows, grassy slopes, stream sides; 3000–4200 m. W Sichuan.


白龙藁本 bái lóng gāo běn

Plants 14–25 cm. Root cylindrical. Stem multicipital, striate, branched, base clothed in fibrous remnant sheaths. Basal petioles 2–5 cm, sheaths oblong-ovate, puberulent; blade ovate, 3.5–2 × 14.5 mm, ternate-2–3-pinnate; ultimate segments linear, 3–10 × 0.5–1 mm. Calamine leaves similar to the basal, reduced, sessile. Terminal umbels 4–7 cm across, lateral umbels smaller, 1–3 cm across, base of umbels puberulent; bracts absent; rays 20–35, unequal, 1–4.5 cm, slender, puberulent; bracteoles 7–12, linear or linear-lanceolate, slightly connate at base, ca. equaling pedicels, without white membranous margin; umbellules 15–25-flowered. Calyx teeth inconspicuous, triangular, minute. Petals white, obovate, base cuneate. Immature fruit oblong-ovoid (mature fruit unknown). Fl. Aug.

● Grassy slopes; ca. 3300 m. NE Yunnan.

This incompletely known taxon is recorded only from the type locality.


线叶藁本 xiàn yè gāo běn


Plants 30–80 cm, glabrous. Root fusiform or tuberous, ca. 3 × 1.5 cm, clustered. Stem single, purplish, slightly inflated at basal nodes, 1–2-branched or unbranched above. Basal petioles 8–10 cm; blade triangular-ovate, 8–10 × 6–10 cm, 2(–3)-pinnate, primary pinnae 6–10 pairs; ultimate segments linear, elongate, 5–15 × 1–2 mm. Calamine leaves gradually reduced upward, uppermost 2-pinnate. Umbels terminal and lateral, terminal umbels 3–5 cm across; bracts 1–2, linear; rays 8–13, subequal, 1.5–3 cm, hispid; bracteoles 5–8, linear, ca. 2 × umbellules. Calyx teeth obsolete. Petals white, obovate, base cuneate. Stylopodium short conic; styles divergent. Fruit oblong-ovoid, ca. 4 × 2–2.5 mm; dorsal and intermediate ribs prominent, lateral ribs narrowly winged; vittae 1–3 in each furrow, 2–6 on commissure. Seed face plane. Fl. Jul–Aug, fr. Sep–Oct.

● Forest margins, alpine scrub and meadows, streamsides; 3000–4200 m. W Sichuan.


细叶藁本 xì yè gāo běn


Plants 60–100 cm. Root branched, caudex short. Stem erect, purplish, hollow, branching. Basal leaves withered at flowering, lower petioles up to 20 cm; blade ternate-3–4-pinnate; ultimate segments linear, 5–30 × 1–3 mm. Umbels terminal and lateral, terminal umbels 3–5 cm across; bracts 1–2, linear, 1–2 cm, white membranous margined, usually caducous; rays 10–18, slightly unequal, 2–5 cm; bracteoles 5–8, lanceolate, 8–15 mm, shorter

- Sparse forests, alpine meadows; 2800–4000 m. W Sichuan, NW Yunnan.

This species is used in NW Yunnan (Lijiang) as a regional substitute, known as “mei mai gao ben,” for the traditional Chinese medicine “qian hu” (see Peucedanum praeruptorum and Angelica decaurata).


多苞藁本 duo bao gao ben

Plants 12–40 cm, pilose throughout. Root fusiform, branched. Stem erect, profusely branched, base densely clothed with fibrous remnant sheaths. Basal petioles 3–9 cm; blade oblong-ovoid or broad-lanceolate, 8–10 × 4–10 cm, pinnate, pinnae 4–5 pairs; ultimate segments oblong-ovate or oblong, 2–5 × 1.5–3 cm, densely pilose on veins, margins incised to pinnatifid. Cauline leaves similar to basal, reduced upwards. Umbels terminal and lateral, 3–9 cm across; bracts 7–10, 2–4 cm, pinnate, densely pilose; rays 20–35, subequal, 2.5–5 cm; bracteoles 10–12, longer than umbellules, 5–10 mm, pinnate, pilose. Calyx teeth conspicuous, triangular, ca. 0.5 mm. Petals white or faintly pinkish, obovate or obcordate, base shortly clawed. Fruit oblong-ovoid, ca. 4 × 2 mm; dorsal and intermediate ribs prominent, filiform, lateral ribs winged; vittae 1–3 in each furrow, 4–6 on commissure. Seed face plane. Fl. Jul–Aug, fr. Sep–Oct. 2n = 22*.

- Coniferous forests, alpine scrub and meadows, riparian grasslands, rock crevices; 2800–4000 m. W Sichuan, SE Xizang, NW Yunnan.


紫色藁本 zi se gao ben

**Ligusticopsis franchetii** (H. de Boissieu) Leute.

Plants 20–35 cm, slender, glabrous. Root fusiform. Stem single, purplish, 1–2-branched above. Basal petioles 7–9 cm, sheaths purplish, oblong-ovate; blade triangular-ovate, 2–3-pinnate, primary pinnae 5–6 pairs; ultimate segments lanceolate, 3.5–5 × 1–2 mm. Cauline leaves similar to basal, reduced, short petiolate to sessile, 1–2-pinnate. Umbels terminal and lateral, 2–4 cm across; bracts absent; rays 6–12, subequal, 1.5–2 cm; bracteoles 4–6, linear, entire, apex 2–3-lobed or 1-pinnate, narrowly membranous-margined; umbellules many-flowered. Calyx teeth subulate, ca. 0.5 mm. Petals purplish obovate or ovate, base cuneate. Stylodipodium short conic; styles reflexed. Fruit oblong-ovate, ca. 4 × 2 mm; dorsal and intermediate ribs prominent, filiform, lateral ribs winged; vittae 1–2–3 in each furrow, 4–6 on commissure. Seed face plane. Fl. Aug–Sep, fr. Oct–Nov.

- Alpine scrub and meadows, rock crevices; 3800–3900 m. SW Sichuan, NW Yunnan.

川滇藁本　川滇大花青葉

Plants (7–)30–60 cm, glabrous. Root fusiform. Stems single or 2–3, 1–2-branched. Basal petioles 3–7 cm; blade oblong or lanceolate, (3–)5–10 × (2–)3–5 cm, 2–3-pinnate; ultimate segments oblanceolate, 2 × 0.5–1 mm, 3-lobed at the apex. Cauline leaves 1–2, similar to basal, reduced. Umbels terminal and lateral, 4–7 cm across; bracts 2–3, linear, entire, apex caudate, rarely 1–2-pinnate; rays (5–)8–10, unequal, (1.5–)3–8 cm; bracteoles 5–7, linear-lanceolate, entire, caudate or apex 2–3-lobed, rarely pinnate, connate at base; umbellules many-flowered. Calyx teeth triangular, ca. 0.4 mm. Petals white, obovate, base cuneate. Styles ca. equaling stylopodium. Fruit oblong-ovoid, ca. 6 × 3–4 mm; dorsal and intermediate ribs prominent, filiform, lateral ribs narrowly winged; vittae 2–3 in each furrow, 4 on commissure. Seed face slightly concave. Fl. and fr. Jul–Sep.

- Coniferous forests, alpine scrub and meadows, alpine talus slopes; 3400–4500 m. W Sichuan, NW Yunnan.

Russian authors consider this species to be synonymous with *Hymenidium chloroleucum* (see *Pleurospermum hookeri* var. *thomsonii*).


细苞藁本　細花青葉

*Ligusticopsis capillacea* (H. Wolff) Leute; *Pleurospermum capillaceum* (H. Wolff) M. Hiroe.

Plants 6–20 cm, hispid throughout. Root stout, 8–25 × 0.5–1 cm; caudex 1–1.5 cm thick. Stems single or 2–4, unbranched or 1-branched, base densely covered in fibrous remnant sheaths. Basal petioles 2–5 cm; blade oblong-ovate, 4–8(–10) × 1.5–3 cm, 2-pinnate, pinnate 5–7 pairs; ultimate segments linear-lanceolate, 2 × ca. 1 mm. Cauline leaves 1–2, reduced. Umbels 2–5 cm across; peduncles up to 15 cm, base of umbels densely hispid; bracts 1–2, 1-pinnate, caducous; rays (4–)10–20, subequal, (1–3) cm; bracteoles 6–8, similar to bracts, slightly exceeding umbellules. Calyx teeth obsolete. Petals white or purple, obcordate, pubescent, base cuneate. Styles ca. 0.5 × fruit, reflexed. Fruit oblong-ovoid, ca. 6 × 3 mm, glabrous; dorsal and intermediate ribs filiform, lateral ribs winged; vittae 1–3 in each furrow, 4–6 on commissure. Seed face plane. Fl. Jul–Aug, fr. Aug–Sep.

- Coniferous forests, alpine scrub and meadows, grassy valley slopes, marshland, rock crevices; 2000–4300 m. Hubei, NE and W Sichuan, S Xizang, NW Yunnan.


云南藁本　雲南青葉

Plants 40–80 cm, pilose throughout. Stem erect, 1–2-branched. Lower leaves petiolate, sheathing; blade subtriangular, 10–15 × 8–12 cm, ternate-2–3-pinnate, primary pinnate 5–6 pairs; ultimate segments lanceolate, 5–15 × 2–5 mm. Upper leaves reduced, 1-pinnate. Umbels terminal and lateral, terminal umbels 3–5–5 cm across; peduncles 8–10 cm; bracts 2–5, 1–2-pinnate; rays 15–20, subequal, ca. 4 cm; bracteoles 5–6, 1-pinnate, nearly as long as umbellules. Calyx teeth obsolete. Petals white, obovate, base cuneate. Styles ca. equaling stylodium. Fruit oblong-ovoid, ca. 4 × 2.5–3 mm; dorsal and intermediate ribs prominent, filiform, lateral ribs narrowly winged; vittae 2–3 in each furrow, 4 on commissure. Seed face plane. Fl. and fr. Jul–Sep.

- Coniferous forests, alpine scrub and meadows, grassy valley slopes; 2500–4000 m. W Sichuan, NW Yunnan.


Plants 20–40 cm, glabrous throughout. Root fusiform. Stems multicellular, sparingly branched, base clothed in fibrous remnant sheaths. Basal and lower petioles (4–)10–20 cm; blade oblong-lanceolate, 2–6 × 1–2 cm, 2–3-pinnate, primary pinnate 5–7 pairs; ultimate segments linear, 2–5 × 0.5–1 mm. Upper leaves few, similar to basal, reduced. Umbels terminal and lateral, 2–3 cm across; bracts 5–10, lanceolate, apex pinnate, margin white membranous; rays 6–13, subequal, 1–2 cm; bracteoles 5–10, lanceolate, 1–2-pinnate or apex 3-lobed, rarely entire, margin white membranous, longer than umbellules. Calyx teeth obsolete. Petals white, oblong-ovoid, base cuneate. Stylodium short conic; styles reflexed. Fruit oblong-ovoid, 5–6 × 3–4 mm; dorsal and intermediate ribs filiform, lateral ribs narrowly winged; vittae 1–2 in each furrow, commissure. Seed face plane. Fl. Aug, fr. Sep–Oct.

- Coniferous forests, alpine scrub and meadows, grassy valley slopes, marshland, rock crevices; 2000–4300 m. Hubei, NE and W Sichuan, S Xizang, NW Yunnan.


玉龙藁本　玉龍青葉


Plants (15–)20–80 cm. Root cylindrical, branched. Stems single or 2, sparsely pilose or glabrous, branched from base, base clothed in fibrous remnant sheaths. Basal and lower petioles 5–10 cm; blade oblong-ovate, 8–15 × 3–4 cm, 1–2-pinnate, pinnate 3–5 pairs; ultimate segments ovate to oblong-ovate, 15–40 × 5–20 mm, margins incised or pinnatifid. Upper leaves reduced, sessile, 1-pinnate. Terminal umbels 4–7 cm across, lateral umbels 1–2, smaller; bracts 2–8, 1-pinnate, pinnate linear; rays 15–30, subequal, 3–4 cm; bracteoles 6–8, 2–3-pinnate, pinnate linear, longer than umbellules; umbellules many-flowered. Calyx teeth linear-lanceolate. Petals white or purplish, obcordate, base cuneate. Styles ca. equaling stylodium in fruit, reflexed. Fruit oblong-ovoid, ca. 4 × 2.5 mm; dorsal and intermediate ribs filiform, lateral ribs winged; vittae 2–3 in each furrow, 6–10 on commissure. Seed face plane. Fl. Jul–Aug, fr. Sep–Oct.
37. **Ligusticum hispidum** (Franchet) H. Wolff in Handel-Mazzetti, Symb. Sin. 7: 723. 1933.

This species has reputed medicinal value. The original description and a cited isotype of *Ligusticum maxsonianum* (Yunnan: Lijiang, J. F. Rock 10380, E) possess a combination of characters in common with *L. scapiforme*.


Plants 8–60 cm, hispid-setulose throughout. Root cylindrical, elongate. Stem very short, base clothed in fibrous remnant sheaths. Leaves lanceolate in outline, 5–10 × 1–3 cm, 2–3-pinnate, primary pinnae 3–4 pairs; ultimate segments lanceolate, 3–5 × 2–5 mm, usually 3–5-lobed, lobes linear. Umbels terminal and lateral, terminal umbels 10–18 cm across; bracts 1–3, 1–2-pinnate; rays (8–)12–22, unequal, elongate up to 24 cm; bracteoles numerous, 2-pinnate, pinnae linear. Calyx teeth ovate or subulate, unequal. Petals white, base cuneate. Styles ca. 1/3 × fruit, reflexed. Fruit oblong-ovoid, ca. 3 × 2 mm; dorsal and intermediate ribs filiform, lateral ribs winged; vitiae 1–2 in each furrow, 4 on commissure. Seed face plane. Fl. Aug, fr. Oct. 2n = 22*.

- Coniferous forest margins, alpine scrub and meadows, grassy slopes, moist rock crevices; 2600–4800 m. W Sichuan, Xizang, NW Yunnan.


Plants 20–50 cm, glabrous. Root stout, cylindrical, 4–10 × ca. 1.5 cm. Stem single, 2–3-branched or unbranched, base clothed in fibrous remnant sheaths. Basal petioles 8–18 cm; blade oblong-ovate, 8–20 × 4–5 cm, 3–4-pinnate, primary pinnae 5–6 pairs; ultimate segments linear, 3–4 × ca. 1 mm. Cauline leaves sessile, sheathing, blade similar to basal, reduced. Umbels terminal and lateral, 7–10 cm across; bracts 1–2, pinnate or absent; rays (10–)14–23, unequal, 1.5–6 cm, scabrid; bracteoles 8–10, 1–2-pinnate, longer than umbellules. Calyx teeth 2–3, subulate, unequal, 1–2 mm. Petals white or purplish abaxially, obovate, base cuneate. Styles ca. equaling styalodium. Fruit oblong, 6–8 × 3–4 mm; dorsal and intermediate ribs raised, lateral ribs winged; vitiae 1–3 in each furrow, 4–6 on commissure. Seed face plane. Fl. Jun–Aug, fr. Sep–Oct. 2n = 22*.

- Coniferous forest margins, alpine scrub and meadows, grassy slopes, moist rock crevices; 2600–4800 m. W Hubei, Sichuan, S Xizang, N Yunnan.

This species has reputed medicinal value (in Sichuan and Yunnan). An isotope of *Ligusticum dielsianum* (Yunnan: Huize, Ta-hai, E. E. Maire 1027. E) is so similar to *L. daucoides* that the two entities cannot be separated.


**Ligusticopsis multivittata** (Franchet) Leute; *Ligusticum modestum* Diels; *L. pseudomodestum* H. Wolff.

Plants (6–)20–40 cm, glabrous. Root cylindrical or fusiform, elongate, 10 cm or more. Stem multicipital, purplish, erect, 1–2-branched or unbranched, base clothed with fibrous remnant sheaths. Basal petioles 4–12 cm; blade oblong-ovate, 5–7 × 3–5 cm, 2–3-pinnate, primary pinnae 5–8 pairs; ultimate segments linear or lanceolate, 3–6 × 1–2 mm. Cauline leaves 1–2, smaller or absent. Umbels terminal, 3–4 cm across, peduncles 4–22 cm; lateral umbels 1–2, smaller; bracts 1–2, pinnate, rarely entire, pinnae entire, hispid; rays 5–10(–20), subequal, 1–2(–3) cm; bracteoles 1–2-pinnate, rarely only apex 2–3-lobed, hispid, longer than umbellules. Calyx teeth conspicuous, triangular or subulate. Petals white or violet, obovate, base cuneate. Fruit oblong, 4–6 × ca. 3 mm; dorsal and intermediate ribs raised, lateral ribs winged; vitiae 2–5 in each furrow, 6–10 on commissure. Seed face plane. Fl. Jul–Aug, fr. Sep–Oct.

- Coniferous forests, bamboo scrub, grasslands, talus slopes; 3000–4100 m. W Sichuan, NW Yunnan.

The holotypes of *Ligusticum modestum* (Yunnan: Lijiang, G. Forrest 2856, E), and *L. pseudomodestum* (Yunnan: J. Kingdom Ward 4664, E) are so similar to *L. multivittatum* that the three entities cannot be separated.
The following taxa have been described from Chinese material, but are imperfectly known as no specimens have been seen or the specimens are inadequate.


73. **PACHYPLEURUM** Ledebour, Fl. Altaic. 1: 296. 1829.

厚棱芹属 hou leng qin shu

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

*Arpitium* Necker & Sweet.

Herbs, perennial. Taproot stout, usually branched. Stem single or multicidal, usually short, sometimes acaulescent, base densely clothed with fibrous remnant sheaths. Basal leaves 2–3-pinnate or ternate-2–3-pinnate. Umbels compound, terminal sessile, laterals pedunculate; bracts several, lanceolate or linear-lanceolate; rays 5–40; bracteoles lanceolate or linear-lanceolate, entire or 1–2-pinnate. Calyx teeth prominent, triangular or lanceolate. Petals white or purple, oblong-ovate or cordate-ovate, base cuneate or shortly clawed, apex notched with small incurved lobe. Stylodium conic or subglobose; styles longer than stylodium. Fruit oblong-ovoid, ovoid or broadly ovoid, dorsally compressed; ribs all winged, subequal; vittae 1(–2) in each furrow, 2(–4) or absent on commissure. Seed face plane.

About six species: Asia, Europe; five species (four endemic) in China.

1a. Plants shortly caulescent to acaulescent; bracteoles 2–3-pinnate.

1b. Plants distinctly caulescent, stems erect, ascending; bracteoles lanceolate or linear-lanceolate, entire.

2a. Calyx teeth lanceolate, ca. equaling stylodium; fruit oblong-ovoid; dorsal ribs adjacent; commissure vittae 2, evident .............................................................. 1. *P. nyalamense*

2b. Calyx teeth linear, several times longer than stylodium; fruit ovoid; all ribs evenly spaced; commissure vittae absent .............................................................. 2. *P. lhasanum*

3a. Bracteoles lanceolate, margins white membranous; leaves 2-pinnate .............................................. 3. **P. alpinum**

3b. Bracteoles linear-lanceolate, margins scabrous; leaves ternate-2–3-pinnate.

4a. Plants 10–30 cm; rays 20–40; petals white; fruit broadly ovoid; vittae 1 in each furrow .......... 4. *P. xizangense*

4b. Plants 70–120 cm; rays 5–10; petals purple; fruit oblong-ovoid; vittae 2 in each furrow .......... 5. *P. muliense*

聂拉木厚棱芹  nie la mu hou leng qin

Plants, 10–15 cm, short-caulescent or acaulescent. Taproot stout, 1 cm thick or more, branched. Basal leaves petiolar; petioles ca. 2 cm, sheathing; blade oblong-lanceolate, 7–10 × 1.5–2 cm, 2–3-pinnate, rachis densely hirsute, pinnae 7–9 pairs; ultimate segments linear. Umbels 6–10 cm across, sessile or peduncle very short; rays 13–20, unequal, 8–10 cm, extending after flowering to 20 cm, angular, scabrous; bracteoles 5–8, 5–10 mm, 1–2-pinnate. Calyx teeth lanceolate, ca. 0.3 mm, ca. equaling stylopodium. Petals white, oblong-ovate. Stylopodium conic; styles ca. 2 × stylopodium. Fruit oblong-ovoid, ca. 6 × 4 mm, glabrous; dorsal ribs adjacent; vittae 1 in each furrow, 2 on commissure. Fl. Jun–Jul, fr. Aug–Sep.

- Alpine scrub and meadows; 3500–3600 m. E and S Xizang.


拉萨厚棱芹 la sa hou leng qin

Plants acaulescent, 10–20 cm. Taproot rather thick. Leaves petiolate, petioles 2–3 cm, sheaths inflated at base; blade oblong-lanceolate, 3–6 × 1–2 cm, 2–3-pinnate, pinnae 4–7 pairs, remote; ultimate segments ovate-lanceolate, 2–3 × ca. 1 mm. Umbels 8–10 cm across, sessile; rays 11–14, extremely unequal, 4–20 cm; bracteoles 6–8, 1–2-pinnate. Calyx teeth linear, several times longer than stylopodium. Petals white, oblong-ovate. Stylopodium conic; styles elongate, ca. 2 mm. Fruit ovoid, 3–4 × ca. 2 mm; all ribs evenly spaced; vittae 1 in each furrow, vittae absent on commissure. Fl. and fr. Jul–Aug.

- Alpine scrub and meadows; 4300–4600 m. W Sichuan, S Xizang.


高山厚棱芹  gao shan hou leng qin

*Arpitium alpinum* (Ledebour) Koso-Poljansky.

Plants 12–20 cm. Taproot vertical, slightly thickened, branched. Stem well developed, single or 2–3, erect, striate, usually unbranched. Basal leaves petiolate, petioles 3–5 cm, sheathing, sheaths inflated; blade ovate or oblong-ovate, 3.5–5 × 1–2 cm, 2–3 pinnate, pinnae 3–5 pairs; ultimate segments linear or linear-lanceolate, 1–1.5 × 0.5–1 mm. Cauline leaves absent or 1–2, similar to basal, reduced, sessile. Umbels 2–3 cm across; bracts 6–8, lanceolate, margins white membranous; rays 10–15, subequal, 1–1.5 cm; bracteoles 8–10, lanceolate, margins white membranous, ca. equaling umbellules in flower, apex sometimes incised. Calyx teeth triangular. Petals white, cordate-ovate, base shortly clawed. Stylopodium subglobose; styles reflexed after flowering. Fruit oblong-ovoid, ca. 6 × 4 mm; vittae 1 in each furrow, 2 on commissure. Fl. Jun–Jul, fr. Jul–Aug.

- Alpine meadows, grassy valley slopes; 3700–4600 m. Xizang.


西藏厚棱芹  xi zang hou leng qin

Plants 10–30 cm. Taproot elongate; caudex rather thick, 2–3 cm across, slightly woody. Stem well developed, caespitose, purplish, striate, branched. Basal leaves petiolate, wholly sheathing; sheaths inflated, purplish; blade oblong or oblong-ovate, 10–15 × 3–5 cm, ternate-2–3-pinnate, pinnae 3–4 pairs, remote; ultimate segments lanceolate or ob lanceolate, 1–2 × 1–1.5 mm. Cauline leaves few, similar to basal, reduced, shortly petiolate or sessile. Umbels 3–6 cm across, enlarging after flowering up to 10 cm across; bracts 10–15, linear-lanceolate, ca. 15 mm, veins purplish, scabrous; rays 20–40, 3–5 cm, scabrous, slightly recurved in fruit; bracteoles 8–10, linear-lanceolate, 7–8 mm, scabrous; umbellules 15–20-flowered. Calyx teeth lanceolate, unequal, 1–1.5 mm. Petals white, oblong-ovate. Stylopodium conic; styles ca. 2 × stylopodium. Fruit broadly ovoid, 5–7 × 4–5 mm; vittae 1 in each furrow, 2 on commissure. Fl. Jun–Jul, fr. Aug–Sep.

- Alpine meadows; 3500–3600 m. E and S Xizang.


木里厚棱芹  mu li hou leng qin


Plants 70–120 cm. Root cylindrical, ca. 8 mm thick. Stem well developed, single, erect, branching. Basal and lower leaves petiolate, wholly sheathing; blade triangular-ovate, 8–10 × 4–8 cm, ternate-2–3-pinnate, pinnae 4–5 pairs, remote; ultimate segments lanceolate, 5–15 × 1.5–4 mm. Upper leaves reduced, sessile; blade 1–2-pinnate. Umbels 3–7 cm across; bracts 3–5, linear, 0.5–1 cm; rays 5–10, unequal, 1.5–5 cm; bracteoles 3–5, linear-lanceolate, equaling pedicels, scabrous; umbellules 15–20-flowered. Calyx teeth lanceolate, ca. equaling stylopodium. Petals purple, cordate-ovate, base shortly clawed. Stylopodium conic; styles ca. 2 × stylopodium. Fruit oblong-ovoid, 5–6 × 3–4 mm; vittae 2 in each furrow, 4 on commissure. Fl. Jun–Jul, fr. Aug–Sep.

- Low shrubs at streamsides; ca. 2600 m. SW Sichuan (Muli).

This rather poorly known taxon is recorded only from a few collections. Recent research suggests that it is conspecific with *Ostericum maximowiczii var. alpinum* C. Q. Yuan & R. H. Shan, and should be included in *Ostericum* at species rank under the name *O. muliense*.


\[ \text{单球芹属 dan qiu qin shu} \]

*Sheh Menglan (余孟兰 Sheh Meng-lan); Mark F. Watson*

Herbs, perennial. Stem terete, erect, fluted, glabrous, branched above, hollow. Basal and lower leaves long-petiolate, sheath
membranous and clasping; blade broad-triangular or triangular-ovate, ternate-pinnate; ultimate segments irregularly dentate or serrate. Leaves reduced upwards. Flowers densely crowded into a compact, globose heads, inflorescence appearing simple, umbels terminal and lateral; bracts several, subulate to linear-lanceolate, entire. Calyx teeth minute, ovate-triangular. Petals dark brown or purplish brown, obovate apex narrowly inflexed, or spoon-shaped, apex acute. Stylodium depressed, styles short. Fruit obovoid-oblong or long-ellipsoid, glabrous, slightly dorsally compressed; ribs conspicuous to narrow-winged; vittae (1–)3 in each furrow, 3–6 on commissure. Seed face plane. Carpophore not seen.

Two species: Bhutan, China, NE India; two species (one endemic) in China.

1a. Basal leaves ternate-1–2-pinnate; petals obovate, apex narrowly inflexed

2. Haplosphaera himalayensis

1b. Basal leaves 3-pinnate; petals broad-ovate, spoon-shaped apex acute

2. H. phaea


单球芹 dan qiu qin

Plants 50–90 cm. Root branched; rootstock stout, dark brown. Lower petioles 10–25 cm; blade broad-triangular or triangular-ovate, 8–15 × 7–15 cm, ternate-1–2-pinnate; lower petioles 1.5–5.5 cm, lateral pinnae ovate to ovate-lanceolate, 2.5–5 × 1.5–2.5 cm, base oblique; median pinnae ovate or obovate, 3-parted, base cuneate; ultimate segments dentate. Umbels 1–2 cm across; peduncles 4–22 cm; bracts several, subulate, linear or linear-lanceolate, 5–10 × ca. 1 mm; pedicels ca. 3 mm. Petals usually purplish brown, obovate, apex narrowly inflexed, mid-rib conspicuous. Fruit obovoid-oblong or long-ellipsoid, ca. 4 × 2–2.5 mm; ribs narrow-winged; vittae 3 in each furrow.


1a. Petioles and rachis glabrous, ultimate segments obovate, 3-lobed, apex rounded

2. C. caespitosa

1b. Petioles and rachis densely puberulous, ultimate segments linear, apex acute.

2a. Dorsal ribs wings broad, slightly narrower than lateral wings, often convoluted and crowded when mature; ultimate leaf segments less than 4 mm; styles (1.5–)2–3.5 mm after flowering

1. Cortiella hookeri

2b. Dorsal ribs wings narrow, often poorly developed, much narrower than lateral wings, not convoluted and crowded; ultimate leaf segments usually more than 4 mm; styles 1.75–3 mm after flowering


栓果芹 shuan guo qin shu

Herbs, perennial, low, acaulescent or shortly caulescent, usually forming compact rosettes closely appressed to soil surface. Tap root stout, vertical. Stem base densely clothed in fibrous remnant sheaths. Leaves petiolate; blade oblong, 2–3-pinnatisect; ultimate segments linear. Umbels compound, solitary terminal umbel usually sessile, appearing as a cluster of simple umbels, lateral umbels few, pedunculate, obviously compound; bracts many, foliaceous, 1–2-pinnate; rays 10–15; bracteoles numerous, linear or apex 3-lobed. Calyx teeth prominent, linear-lanceolate or triangular-acuminate, unequal. Petals ovate, entire or emarginate, apex narrowly inflexed. Fruit pale yellow or purplish tinged when mature, flat-globose, dorsally compressed, cortate at both ends; ribs broadly winged, wings corky-spongy, unequal, lateral wings usually broader than dorsal; vittae 1 in each furrow, 2 on commissure. Seed face plane. Carpophore 2-cleft to base.

Three species: Bhutan, China, NE India, Nepal, Sikkim; three species (one endemic) in China.

1a. Petioles and rachis glabrous, ultimate segments obovate, 3-lobed, apex rounded

2. C. caespitosa

1b. Petioles and rachis densely puberulous, ultimate segments linear, apex acute.

2a. Dorsal ribs wings broad, slightly narrower than lateral wings, often convoluted and crowded when mature; ultimate leaf segments less than 4 mm; styles (1.5–)2–3.5 mm after flowering

1. Cortiella hookeri

2b. Dorsal ribs wings narrow, often poorly developed, much narrower than lateral wings, not convoluted and crowded; ultimate leaf segments usually more than 4 mm; styles 1.75–3 mm after flowering


栓果芹 shuan guo qin shu

Cortiella hookeri C. B. Clarke in J. D. Hooker, Fl. Brit. India 2: 702. 1879; Schultzia hookeri (C. B. Clarke) M. Hiroe; Cortiella cauwetmarciana Farille & S. B. Malla; Cortiella glacialis Bonner; Pleurosenderum glaciale (Bonner) M. Hiroe.

Leaf rachis and petioles fluted, densely fulvous puberulous; blade narrowly oblong, 2.5–7 × 0.8–2 cm, 2–3-pinnatisect; pinnae 4–5 pairs, sessile, puberulous; ultimate segments linear, 2–4 × 0.4–0.8 mm, margins narrowly revolute, apex acute.
Umbellules 1–1.5 cm across; bracts several, foliaceous, 1–2-pinnatisect; rays 8–18, unequal, stout, pubescent; bracteoles ca. 10, linear or long-obovate, 8–12 × 0.5–1 mm, 3-lobed, lobules lanceolate. Petals white or pinkish white, occasionally purplish, ovate, apex acute, slightly incurved. Styles (1.5–)2–3.5 mm after flowering. Fruit oblong-globose, 3–6 × 3–5 mm, wings occasionally tinged dark purple; dorsal ribs wings broad, slightly narrower than lateral wings, often convoluted and crowded when mature. Fl. Aug, fr. Oct.

Nepal, Sikkim.


Leaves petiolar, petioles 3–8 cm, pubescent; blade oblong or oblong-obovate, 3–10 × 1.5–4 cm, 2–3-pinnate; pinnae 3–4 pairs; ultimate segments linear to linear-lanceolate, 4–7(–13) × 0.75–1 mm. Bracts absent; rays numerous, arising from caudex, 3–6 cm, hispid; bracteoles 4–6, linear, entire, or apex 2–3-lobed; umbellules 18–25-flowered; pedicels 2–3 mm. Petals white, occasionally tinged purple. Styles 1.75–3 mm after flowering. Fruit suborbicular, 4–5.5 × 4–5 mm; lateral ribs broadly winged, dorsal ribs narrowly winged, wings often poorly developed and often reduced to aborted structures at base. Fl. Aug–Sep, fr. Sep–Oct.

Mountain rock crevices, scree slopes and sandy areas; 4000–5400 m. S Xizang (Yadong) [Bhutan, NE India, Nepal, Sikkim].

Three or four species: Afghanistan, China, Bhutan, N India, Nepal, Pakistan, Sikkim; one species in China.


Herbs, perennial, acaulescent or shortly caulescent, ascending, rosette but rarely closely appressed to soil surface. Taproot stout, vertical, elongate. Stem base densely clothed in fibrous remnant sheaths. Basal leaves petiolar; blade oblong or oblong-obovate, 3–6 × 2–3 mm, 3-lobed, thick-papery, sessile, apex rounded. Bracts 2–4, foliaceous, pinnate; bracteoles 4–8, linear, 3–5 × ca. 0.3 mm, entire; rays and pedicels thick, pedicels dilated at tip. Petals white or purplish tinged, ovate or elliptic, apex acute, slightly incurved, costa purplish-brown, very conspicuous.; styles ca. 2 mm in fruit, divergent or slightly recurved. Fruit yellowish white, oblong-globose, ca. 6 × 5.5 mm, ribs all broadly corky-winged, wings 1–1.2 mm wide. Fl. and fr. Aug–Oct.

Grassy places in mountain valleys; ca. 4200 m. Xizang [Bhutan, Nepal, Sikkim].

Corti depressa Athamanta depressa


Cortiella caespitosa

C. ne palensis


Cortiella caespitosa

Cortiella cortioides

76. CORTIA de Candolle, Prodr. 4: 186. 1830.


Plants 5–10(–20) cm. Petioles and rachis thick, adaxially shallowly fluted, pubescent; blade 1.5–10 × 0.75–3 cm, 2–3-pinnatisect, pinnae 5–7 pairs; ultimate segments linear, 3–5 × 0.5–1 mm, margins entire, narrowly revolute. Bracts few, 2-pinnate, segments linear; rays numerous, 3–6 cm, unequal. pubescent; bracteoles 10–15, 2-pinnatisect, narrow-linear, longer than flowers; umbellules 25–30-flowered. Styles 0.5–1.5 mm, fr. Jul–Sep.

Alpine meadows; ca. 4400 m. SC Xizang (Namling) [Bhutan, NE India, Nepal, Sikkim].

Three or four species: Afghanistan, China, Bhutan, N India, Nepal, Pakistan, Sikkim; one species in China.


Herbs, perennial. Stem solitary, base clothed with fibrous remnant sheaths. Basal leaves petiolar; blade oblong or oblong-obovate, 3–10 × 1.5–4 cm, 2–3-pinnatisect; pinnae 3–4 pairs; ultimate segments linear to linear-lanceolate, 4–7(–13) × 0.75–1 mm. Bracts absent; rays numerous, arising from caudex, 3–6 cm, hispid; bracteoles 4–6, linear, entire, or apex 2–3-lobed; umbellules 18–25-flowered; pedicels 2–3 mm. Petals white, occasionally tinged purple. Styles 1.75–3 mm after flowering. Fruit suborbicular, 4–5.5 × 4–5 mm; lateral ribs broadly winged, dorsal ribs narrowly winged, wings often poorly developed and often reduced to aborted structures at base. Fl. Aug–Sep, fr. Sep–Oct.

Mountain rock crevices, scree slopes and sandy areas; 4000–5400 m. S Xizang (Yadong) [Bhutan, NE India, Nepal, Sikkim].

Three or four species: Afghanistan, China, Bhutan, N India, Nepal, Pakistan, Sikkim; one species in China.


羽苞芹属


Oreocomopsis

Herbs, perennial. Stem solitary, base clothed with fibrous remnant sheaths. Leaves 2–4-pinnate; ultimate segments lanceolate or rhombic, margins dentate. Bracts several, similar to the upper cauline leaves, pinnate, rarely entire; bracteoles linear or filiform, 2–3 × umbellules, reflexed. Calyx obsolete. Petals oblanceolate or obovate, base cuneate, apex acuminate, incurved. Stylopodium conical; styles short, reflexed. Fruit ovoid, scarcely dorsally compressed, glabrous, commissure narrow; ribs prominent, winged, wings

羽苞芹属

Oreocomopsis


Oreocomopsis

Herbs, perennial. Stem solitary, base clothed with fibrous remnant sheaths. Leaves 2–4-pinnate; ultimate segments lanceolate or rhombic, margins dentate. Bracts several, similar to the upper cauline leaves, pinnate, rarely entire; bracteoles linear or filiform, 2–3 × umbellules, reflexed. Calyx obsolete. Petals oblanceolate or obovate, base cuneate, apex acuminate, incurved. Stylopodium conical; styles short, reflexed. Fruit ovoid, scarcely dorsally compressed, glabrous, commissure narrow; ribs prominent, winged, wings

羽苞芹属

Oreocomopsis


Oreocomopsis

Herbs, perennial. Stem solitary, base clothed with fibrous remnant sheaths. Leaves 2–4-pinnate; ultimate segments lanceolate or rhombic, margins dentate. Bracts several, similar to the upper cauline leaves, pinnate, rarely entire; bracteoles linear or filiform, 2–3 × umbellules, reflexed. Calyx obsolete. Petals oblanceolate or obovate, base cuneate, apex acuminate, incurved. Stylopodium conical; styles short, reflexed. Fruit ovoid, scarcely dorsally compressed, glabrous, commissure narrow; ribs prominent, winged, wings
on lateral ribs broader; vittae (1–)2–3 in each furrow, 4–6 on commissure. Seed face slightly concave. Carpophore 2-cleft to base.

Two species: Himalayan region, W China; one species (endemic) in China.

Oreocomopsis resembles Oreocome Edgeworth, but differs in having bracts pinnate (rarely entire); bracteoles linear or filiform, 2–3 × umbellules; mericarp commissure narrowed; and mesocarp parenchyma not lignified.


Plants 25–30 cm, roots cylindric. Stem erect, 4–5 mm thick, often violet at base. Basal leaves petiolate, petioles 8–10 cm, glabrous; blade rhomboid in outline, 6–12 × 6–12 cm, 3–4-pinnate, primary pinnate petiolar, but distal sessile; ultimate segments rhomboid or ovate ca. 6–10 mm, margin pinnate, dentate or lobed on each side. Upper leaves few (1–2), similar to basal, but reduced. Umbels 6–10 cm across; bracts 6–10, ca. equaling rays, 1–2-pinnate, pilose; rays 12–26, unequal, 4–9 cm, pilose; bracteoles numerous, filiform, entire or 2-lobed, 2–3 × umbellules, reflexed, pilose. Petals deep violet, 1.2–2.3 mm. Fruit 6–6.5 × 3.5–4 mm. Fr. Sep.

- Rhododendron forests, valleys; 5100–5300 m. S Xizang (Nyalam, Rinbung).

This rather poorly known taxon is recorded from only a few collections. One of us (Pu) has examined no specimens. The species is closely allied to Oreocomopsis stelliphora (Cauvet & Farille) Pimenov & Kljuykov, from Nepal, in having bracts folliculate and bracteoles 2–3 × as long as umbellules, but it differs most noticeably in having pilose rays, bracts, and bracteoles; rays 12–26 (vs. 6–8); and calyx teeth absent (vs. evident).

78. CONIOSELINUM Fischer ex Hoffmann, Gen. Pl. Umbell. xxxiii, 1810. 1814.

山芎属 shan xiong shu

Pan Zehui (潘泽惠); Mark F. Watson

Herbs, perennial. Stem hollow, ribbed, base without fibrous remnant sheaths. Leaves petiolate, base sheathing; blade 2–3-pinnatisect or 2–3-ternate-pinnatisect. Umbels compound, terminal and lateral; bracts absent or few; bracteoles linear, petioles 6–14 cm, sheathing; blade oblanceolate, 3–4 × umbellules, reflexed, pilose. Petals deep violet, 1.7–2.3 mm. Fruit 6–7 × 3.5–4 mm. Fr. Jul–Aug.

About 12 species: E Asia, C Europe, North America; three species (one endemic) in China.

1a. Bracts absent; rays smooth (Xinjiang) .......................................................... 2. C. vaginatum

1b. Bracts 1–5, linear to lanceolate; rays scabrous or pubescent.

2a. Rays 10–13, slightly scabrous; vittae 1 in each furrow, 4 on commissure (SE China) .............................................. 1. C. chinense

2b. Rays 8–10, pubescent; vittae 4 or 5 in each furrow, 8–9 on commissure (Taiwan) ....................................................... 3. C. morrisonense


山芎 shan xiong

Aethamanta chinensis Linnaeus, Sp. Pl. 1: 245. 1753; Cnidium chinense (Linnaeus) Sprengel ex Steudel; Crepidium chinense (Linnaeus) Rafinesque; Ligusticum chinense (Linnaeus) Crantz; Selinum chinense (Linnaeus) Druce.

Plants 50–100 cm. Root dark brown, branched. Stem branched. Basal and lower petioles ca. 5 cm, sheaths narrow-ovate; blade ovate to triangular-ovate, 15–25 × 10–15 cm, 2–3-ternate-pinnate; pinnate petiolar, pinnules ovate, 1–5 × 0.5–3 cm; ultimate segments linear, 3–7 × 1–3 mm. Umbels ca. 5 cm across; bracts 1–2, linear, 1–1.5 cm, narrowly scarious-margined; rays 10–13, 2–3 cm, subunequal, slightly scabrous; bracteoles 5–8, linear, 0.5–1 cm. Petals obovate. Stylopodium low-conic. Fruit ellipsoid to ovoid, 6–8 × 5–6 mm. Fr. Jul–Aug.

Mountain ravines, stream banks; ca. 1000 m. Anhui, Jiangxi [Japan, Russia; North America].

2. Conioselinum vaginatum (Sprengel) Thellung in Hegi, Ill. 1819.


Plants 60–120 cm. Root conic, branched; rhizome stout. Stem branched. Basal leaves deciduous. Cauline leaves petiolate, petioles 6–9 cm, base sheathing; blade triangular-ovate, 16–25 × 15–23 cm, 2–3-ternate-pinnate; ultimate segments long-ovate to lanceolate, 1.5–2 × 0.5–0.8 cm, pinnatifid. Umbels 5–10 cm across; bracts absent; rays 10–14, 2–4 cm; bracteoles 5–8, linear, ca. 5 mm. Petals obovate. Stylopodium short-conic. Fruit ellipsoid, slightly flattened dorsally; ribs all prominent; vittae 2–3 in each furrow, 4–6 on commissure. Fl. and fr. Jul–Aug.

Shubby thickets, grasslands; 1300–2700 m. Xinjiang [Kazakhstan, Kyrgyzstan, Russia (Siberia), Turkmenistan, Uzbekistan: C Asia, SW Asia, C Europe].

This species is used in Taiwan as a regional substitute for the traditional Chinese medicine “gao ben” (see Ligusticum sinense and L. jeholense).

79. ARCHANGELICA  

**Archangelica** Wolf, Gen. Pl. 32. 1776.

Herbs, perennial, stout. Stem hollow. Leaves large, 2–3-pinnatisect. Umbels compound, terminal or lateral; rays numerous; bracts and bracteoles several, lanceolate or linear-lanceolate. Calyx teeth obsolete. Petals white, elliptic to oblong, apex acuminate, inflexed. Stylopodium short conic, margin sinuolate. Fruit ellipsoid, flattened dorsally, glabrous; ribs all corky-winged, lateral wings slightly broader than dorsal, intervals broad; vittae many, moderate in size to small and almost encircling the seed. Seed face plane or slightly concave. Carpophore 2-cleft to base.

About ten species: N temperate region; two species in China.

**Archangelica** is closely allied to *Angelica*; see the taxonomic comment under that genus.

---


**短茎古当归** duan jing gu dang gui

*Angelocarpa brevicaulis* Ruprecht in Osten-Sacken & Ruprecht, Sert. Tianschan. 48. 1869; *Angelica brevicaulis* (Ruprecht) B. Fedtschenko; *Coelopleurum brevicaule* (Ruprecht) Drude.

Plants 40–100 cm. Root brown, cylindric, stout. Stem 2–6 cm thick, thinly ribbed. Basal leaves to 100 cm (including petiole). Cauline leaves petiolate, petioles 8–17 cm, sheaths saccate-inflated, to 6 cm wide, glabrous; blade broadly triangular-ovate, 11–15(-20) × 11–17 cm, 2–3-pinnate; leaflets subsessile, oblong to ovate-lanceolate, base cuneate, margin irregularly toothed, glabrous, terminal leaflets often 3-lobed, decurrent along petiolules. Umbels subglobose, 7–15 cm across; bracts 4–7, lanceolate, pubescent; rays 20–50, 2.5–3 cm, subequal, hispidulous; bracteoles 5–10, linear-lanceolate, margin ciliate, shorter than or equaling pedicels; umbellules 30–50-flowered. Petals broad-ovate. Fruit 5–10 × 3–5 mm; ribs all thick-winged, lateral ribs narrower than the body; vittae numerous, small, encircling the seed. Fl. Jul–Aug, fr. Aug–Sep.

Meadows, damp stream banks; 500–1500 m. Nei Mongol, Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia (Siberia); C and E Asia].

This species has reputed medicinal value in Nei Mongol.

---


**下延叶古当归** xia yan ye gu dang gui


Plants 1–2 m. Root brown, cylindrical, stout. Stem 2–6 cm thick, thinly ribbed. Basal leaves to 100 cm (including petiole). Cauline leaves petiolate, petioles 8–17 cm, sheaths saccate-inflated, to 6 cm wide, glabrous; blade broadly triangular-ovate, 11–15(-20) × 11–17 cm, 2–3-pinnate; leaflets subsessile, oblong to ovate-lanceolate, base cuneate, margin irregularly toothed, glabrous, terminal leaflets often 3-lobed, decurrent along petiolules. Umbels subglobose, 7–15 cm across; bracts 4–7, lanceolate, pubescent; rays 20–50, 2.5–5 cm, subequal, hispidulous; bracteoles 5–10, linear-lanceolate, margin ciliate, shorter than or equaling pedicels; umbellules 30–50-flowered. Petals broad-ovate. Fruit 5–10 × 3–5 mm; ribs all thick-winged, lateral ribs narrower than the body; vittae numerous, small, encircling the seed. Fl. Jul–Aug, fr. Aug–Sep.

Forests, shrubby thickets, ravines, river banks, damp areas; 500–1500 m. Nei Mongol, Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia (Siberia); C and E Asia].

This species has reputed medicinal value in Nei Mongol.

80. COELOPLEURUM  


**高山芹属** gao shan qin shu

*Homopteryx* Kitagawa; *Physolophium* Turczaninow.
Herbs, perennial. Stem hollow. Leaves 2–3-pinnate or 2–3-ternate-pinnate, sheaths inflated. Umbels compound, terminal or lateral. Calyx teeth obsolete. Petals white, long-elliptic, apex inflexed. Stylodinium short-conic, margin often sinuolate. Fruit ellipsoid or ovoid-ellipsoid, slightly flattened dorsally, glabrous; ribs all broad, thickly winged, lateral ribs slightly broader than the dorsal or nearly equal; vittae 1–3 in each furrow, 2–4 on commissure. Seed face plane or concave. Carpophore 2-cleft to base.

About four species: E Asia, North America; two species in China.

This genus differs from *Angelica* and other related genera in its nearly equally winged fruit and chromosome number \( n = 14 \); see also the taxonomic comment under *Angelica*.

1a. Leaves 2–3-ternate-pinnate, leaflets to 7 × 4 cm, glabrous; dorsal ribs broad, vittae 1 in each furrow, 2 on commissure ...................................................................................................................................................................... 1. *C. saxatile*

1b. Leaves 2–3-pinnate, leaflets to 2 × 1.2 cm, pubescent; dorsal ribs narrow, vittae 1–3 in each furrow, 3–4 on commissure ................................................................................................................................................................. 2. *C. nakaianum*

### 1. *Coelopleurum saxatile* (Turczaninow ex Ledebour) Drude

**Turczaninow ex Ledebour.** Drude in Engler & Prantl, Nat. Pflanzenfam. 3(8): 213. 1898.

**高山芹**


Plants 60–80 cm. Root brown, cylindrical, ca. 2 cm thick. Stem purplish-green, sparsely pubescent, little-branched above, thin-ribbed. Basal and lower leaves long-petiolate, deciduous. Middle leaves short petiolate, sheaths broad-membranous; blade 2–3-ternate-pinnate; leaflets subsecisile, rhombic-ovate or oblique-ovate, up to 7 × 4 cm, base cuneate or subrounded, margin coarse-serrate, apex acuminate, glabrous. Umbels 5–9 cm across; bracts absent; rays 12–15, 3–4.5 cm, densely pubescent; bracteoles 7–8, linear, ciliate, much longer than pedicels; pedicels 20–30, hispidulous. Fruit ellipsoid, 4–5 × 2–3 mm; vittae 1 in each furrow, 2 on commissure. Fl. Jul–Aug, fr. Aug–Sep. \( n = 14^* \).

Damp forests, ravines, steep slopes, grasslands; above 1900 m. Jilin (Changbai Shan) [Korea, Russia].

This species differs from *Coelopleurum gmelinii* (de Candolle) Ledebov, from Russia (Kamchatka and Siberia), in having fruit with broad intervals and few vittae.


**长白高山芹**


Plants 20–40 cm. Root brown, cylindrical, ca. 1 cm thick. Stem green or purple-green branched, nodes hispidulous. Basal and lower petioles 4–6 cm, sheaths membranous-inflated; blade broad-ovate, 3–5 × 3–7 cm, 2–3-pinnate; leaflets sessile, oblong to broad-ovate, up to 2 × 1.2 cm, base cuneate, margin cuspitate-toothed, apex acuminate, white-pubescent axially, glabrous or sparse pubescent abaxially; proximal leaflets often 3-lobed. Umbels 3–7 cm across, enlarging to 10 cm in fruit; bracts absent or 1, linear-lanceolate, deciduous; rays 12–15, scabrous; bracteoles 6–10, linear, ca. 1 cm, much longer than pedicels, sparsely pubescent. Petals broad-ovate. Anthers dark purple. Fruit ovoid, 3.5–5 × 2.5–4 cm; vittae 1–3 in each furrow, 3–4 on commissure. Fl. Jul–Aug, fr. Aug–Sep.

Alpine meadows; above 2000 m. Jilin (Changbai Shan) [N Korea].


**柳叶芹属**

*Pan Zehui* (潘泽惠); Mark F. Watson

Herbs, biennial. Stem hollow, thinly ribbed, essentially glabrous, scabrous below umbel. Leaves petiolate, sheaths inflated; blade 2-pinnatisect. Umbels compound, terminal and lateral; bracts 1, deciduous; bracteoles 7–8, linear, ciliate, much longer than pedicels; pedicels 20–30, hispidulous. Fruit ellipsoid, 20–27, 3–4.5 cm, densely pubescent. Anthers dark purple. Fruit ovoid, 3.5–5 × 2.5–4 cm; vittae 1–3 in each furrow, 4–10 on commissure. Seed face plane. Carpophore 2-cleft to base.

One species: China, Korea, Russia (Siberia).

*Czernaevia* is sometimes included within *Angelica*, but differs in the dimorphic petals and absence of coumarins and flavonoids; see also the taxonomic comment under *Angelica*.


**柳叶芹**

Plants 60–120 cm. Root cylindric, 0.8–1.5 cm thick. Stem simple or little-branched. Petioles 8–12 cm, sheaths narrowly oblong; leaf blade triangular-ovate or oblong-ovate, 15–30 × 10–25 cm, 2-pinnate; leaflets subsecisile, lanceolate or oblong-lanceolate to oblong-ovate, 1.5–7 × 0.5–4 cm, base slightly oblique, sometimes 1–2-minute-toothed, acutely serrate with white cartilaginous margin, apex acuminate, glabrous or hispidulous along nerves abaxially. Umbels 5–15 cm across; bracts
1. Fruit suborbicular, lateral ribs broadly winged ................................. 1a. var. laevigata
1b. Fruit broad-ovoid, lateral ribs almost wingless ......................... 1b. var. exalatocarpa

1a. Czernaevia laevigata var. laevigata

1b. Czernaevia laevigata

Plants green. Fruit suborbicular, lateral ribs broadly winged. *n* = 11*).

Shrubby thickets, damp grasslands, river banks. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol [Korea, Russia (Siberia)].

The young stems and leaves can be used as a vegetable and for forage. The leaves contain 0.3% aromatic oil.


无翼柳叶芹 wu yi liu ye qin

Plants green or purplish green. Fruit broad-ovoid, lateral ribs almost wingless.

- Forests, meadows. Hebei, Heilongjiang, Jilin, Liaoning.


当归属 dang gui shu

Pan Zehui (潘泽惠); Mark F. Watson

Herbs, biennial or perennial. Root often stout, conic or cylindric. Leaves petiolate, petiole sheaths conspicuously inflated; blade 1–4-pinnate or 1–3-ternate-pinnate. Umbels compound, terminal and lateral; bracts many or a few, rarely absent; rays many to several; bracteoles many or a few, entire. Calyx teeth obsolete or ovate-triangular. Petals white, rarely pink or dark purple, ovate to obovate, apex incurved. Stylodium short-conic. Fruit ovoid to orbicular, dorsally compressed; dorsal ribs filiform, lateral ribs broad- or narrow-winged, separated when mature; vittae often 1–2 in each furrow, 2–4 on commissure. Seed face plane or slightly concave. Carpophore 2-cleft to base.

Over 90 species: N temperate zone; 45 species (32 endemic) in China.

The classification of Angelica and related genera (Archangelica, Coelopleurum, Czernaevia, Ostericum, etc.) is complex and controversial, and many species are known only from a few specimens. A comprehensive revision of this large group, including new collections and analyses of DNA sequence data, is needed before any major changes to the traditional classification can be accepted.

*Angelica taiwiana* S. S. Ying (Quart. J. Chin. Forest. 8(4): 125. 1975) was described from Taiwan (“Daikwanzan to kwanzan,” 2800 m, *N. Fukayama s.n., holotype, TAI”). However, it is not treated in this account as it is imperfectly known.

1a. Leaf sheaths pubescent or spinulose.

2a. Leaf rachis densely pubescent ............................................................................................................................................... 1. *A. duclouxii*

2b. Leaf rachis glabrous.

3a. Leaves glabrous.

4a. Bracts 5–9; vittae absent on commissure .................................................................................................................... 2. *A. apaensis*

4b. Bracts absent or 1; vittae 2 on commissure .................................................................................................................... 3. *A. anomalaa*

3b. Leaves hispid or setulose along nerves.

5a. Leaf sheaths spinulose; fruit ellipsoid to narrow-ellipsoid; vittae 4 on commissure .................................................. 4. *A. valida*

5b. Leaf sheaths pubescent; fruit suborbicular to ellipsoid; vittae 2 on commissure ...................................................... 5. *A. setchuenensis*

1b. Leaf sheaths smooth (occasionally slightly pubescent in *A. biserrata*).

6a. Rachis and petiolules geniculate.

7a. Ovary puberulent or hispidulous.

8a. Bracteoles absent .................................................................................................................................................. 6. *A. fargesii*

8b. Bracteoles many, linear ........................................................................................................................................... 7. *A. genuflexa*

7b. Ovary glabrous.

9a. Bracteoles white-scarious-margined; fruit narrow-oblong, 6–7 × 3–3.5 mm ......................................................... 8. *A. tianmuensis*

9b. Bracteoles not white-scarious-margined, fruit oblong-ellipsoid, 6–7 × 3–5 mm ......................................................... 9. *A. polymorpha*

6b. Rachis and petiolules not geniculate.

10a. Basal and lower cauline leaves 1–4-pinnate.


12a. Apex of leaves obtuse ................................................................................................................................................ 10. *A. nitida*

12b. Apex of leaves acute to long-acuminate.

13a. Bracteoles lanceolate, apex long- aristate ........................................................................................................ 11. *A. dielsii*
13b. Bracteoles small, subulate ................................................................. 12. A. omeiensis
14a. Leaves 2–4-pinnate.
15a. Leaflet margin ciliate, apex long-caudate-acuminate ........................................ 18. A. longipes
15b. Leaflet margin not ciliate, apex acute.
16a. Petals white; calyx teeth obsolete ....................................................... 19. A. sylvestris
16b. Petals greenish; calyx teeth conspicuous, triangular-ovate ..................................... 20. A. dailingensis
14b. Leaves 1–2-pinnate.
17a. Leaves pinnate.
18a. Pedicels 10–25 mm (Yunnan) .......................................................... 13. A. longipedicellata
18b. Pedicels 4–7 mm (Taiwan) ............................................................ 14. A. tarokoensis
17b. Leaves 2-pinnate.
19a. Leaflets glabrous ........................................................................ 15. A. songpanensis
19b. Leaflets pubescent along nerves.
20a. Bract and bracteole margin ciliate; rays densely pubescent ........................................ 16. A. pseudoselimum
20b. Bract and bracteole margin not ciliate; rays subglabrous ..................................... 17. A. morrisonicola
10b. Basal and lower cauline leaves 1–3-ternate or 1–3-ternate-pinnate.
21a. Leaves 1–3-ternate.
22a. Apex of leaves acuminate; vittae 2–3 in each furrow, 4 on commissure (Gansu, Shaanxi) .......... 21. A. tsinlingensis
22b. Apex of leaves obtuse-rounded or acute; vittae 1 in each furrow, 2 on commissure (Xinjiang) .......... 22. A. ternata
21b. Leaves 1–3-ternate-pinnate.
23a. Petals hirsute abaxially; ovary hispid .................................................. 23. A. hissutiflora
23b. Petals and ovary glabrous (ovary pubescent in A. dahurica var. formosana).
24a. Calyx teeth conspicuous, triangular-ovate to subulate.
25a. Leaves ternate to ternate-pinnate; secondary ribs of fruit 2, slightly prominent .................. 24. A. oncosepala
25b. Leaves 1–2-ternate-pinnate; secondary ribs of fruit not developed.
26a. Bracteoles pinnate ........................................................................ 25. A. pinnatiloba
26b. Bracteoles not pinnate.
27a. Leaflets decurrent on petioles, hispidulous adaxially ............................................. 26. A. decursiva
27b. Leaflets not decurrent, glabrous ........................................................................ 28. A. kangdingensis
24b. Calyx teeth obsolete.
28a. Bract and bracteole margin ciliate.
29a. Stem glabrous.
30a. Fruit narrow-oblong, 5–9 × 2.5–4 mm; vittae 3–6 on commissure ......................... 29. A. longicaudata
30b. Fruit suborbicular, 4–6 × 3–5 mm; vittae 2 on commissure ................................. 30. A. laxifoliata
29b. Stem pubescent or hispidulous.
31a. Leaflet margin serrulate and ciliate, rays 40–60 ............................................. 31. A. maowenensis
31b. Leaflet margin irregularly biserrate; rays 10–25 ................................................. 32. A. biserrata
28b. Bract and bracteole margin not ciliate.
32a. Leaflet base decurrent, rachis conspicuously winged.
33a. Bracts absent; petals white .................................................................. 33. A. cartilaginomarginata
33b. Bracts 2; petals dark purple-red ............................................................. 27. A. gigas
32b. Leaflets base not decurrent (A. dahurica slightly decurrent), rachis not winged.
34a. Stem and leaves glabrous.
35a. Bracts absent; fruit narrow-oblong .................................................... 34. A. acutiloba
35b. Bracts developed; fruit ellipsoid to suborbicular.
36a. Rays 17–30, unequal; fruit 5–7 mm long ................................................ 35. A. paeoniiifolia
36b. Rays 10–20, subequale; fruit 7–12 mm long.
37a. Proximal pinnules of leaves 3-foliolose; dorsal ribs of fruit equally winged (Xizang) .......... 36. A. glauca
37b. Proximal pinnules of leaves not 3-foliolose; dorsal ribs of fruit unequally winged (Xinjiang) ......... 37. A. multicaulis
34b. Stem and leaves usually hairy.
38a. Rachis, peduncles, rays and pedicels all densely hispidulous .............................. 38. A. amurensis
38b. Rachis, peduncles, rays and pedicels partly hairy or glabrous.
39a. Leaves 1–2-ternate-pinnate; bracteoles entire to 2–3-lobed .................................. 39. A. balangshansensis
39b. Leaves 2–3-ternate-pinnate; bracteoles entire.
40a. Leaflets 2–3.5 × 0.8–2.5 cm.
41a. Bracteoles pubescent; lateral ribs of fruit narrow-winged, wings narrower than the body ... 40. A. morii
41b. Bracteoles glabrous; lateral ribs of fruit broad-winged, wings wider than the body ....... 41. A. sinensis

Plants perennial. Stem stout, ribbed, villous when young. Cauline leaves petiolate, petioles ca. 10 cm, winged with narrow-oblong sheaths, densely pubescent; blade broad-obovate, 30–35 cm, 3-ternate-pinnate, rachis densely pubescent; pinnae 4 pairs, long petiolate, leaflets subsessile, oblong-ovate to suborbicular, 2.5–6 × 1.7–4.5 cm, entire or 2–3-lobed, margin serrate, pubescent along nerves on both surfaces. Peduncles 4–6 cm, densely pubescent; bracts absent; rays 25–50, 3–10 cm, unequal, scabrous along one side; bracteoles 7–10, linear-lanceolate, 4–6 mm, sparse-ciliate, pedicles 4–10 mm. Calyx teeth obsolete. Petals white, obovate, notched. Fruit ellipsoid or narrow-ellipsoid, 4–5 × 2–3 mm, base truncate; dorsal ribs filiform, lateral ribs broad-winged; vittae 1 in each furrow. Fl. Aug.


Plants perennial, 1–2 m, stout. Root cylindric, ca. 2.5 cm thick. Stem stout, ribbed, white-pubescent. Petioles 8–10 cm, sheaths 3.5–4 cm, broad-ovate or saccate, pubescent; blade elliptic or triangular-ovate, 2–3-pinnate, glabrous; pinnae 3–4 pairs, subsessile, leaflets long-elliptic or lanceolate, 4–5 × 1.5–2.5 cm, margin serrate, sometimes 1–3-lobed. Umbels 10–20(–32) cm across; peduncles 16–20 cm, pubescent; bracts 5–9, long-lanceolate, puberulent; rays 28–65, 6–15 cm, purple-green, pubescent; bracteoles 4–8, 12–14 mm, linear; umbellules 25–50-flowered. Calyx teeth obsolete. Petals white, ovate. Fruit ellipsoid, broad-ovoid to suborbicular, 5–10 × 5–9 mm; dorsal ribs prominent, thick, obtuse, lateral ribs thick, broad-winged; vittae 1 in each furrow, absent on commissure. Fl. Jun–Jul, fr. Aug–Sep. n = 11*.


Herbs ca. 75 cm high. Rhizome long, creeping. Stem ribbed, setulose above. Basal and middle leaves petiolate, petioles 12–15 cm, sheaths ovate, pubescent; blade broad-triangular, 12–20 × 16–28 cm, 2-ternate-pinnate; leaflets sub sessile, obliquely triangular-ovate, ca. 5 × 2.5 cm, base truncate, margin incised-serrate, teeth white-mucronulate, sparsely setulose on nerves abaxially. Upper leaves reduced, sheaths broad-inflated. Bracts few, linear-lanceolate; rays 15–40, 2–4 cm, setulose, unequal; bracteoles several, short-linear to lanceolate, reflexed.

Petals white, obcordate, ca. 2 × 2 mm, 1-nerved. Fruit suborbicular, 4–8 × 3.6–6 mm; pedicels unequal, to 15 mm. Petals white, ovate; ovary sparsely pubescent; umbellules 20–25-flowered; pedicels unequal, pubescent. Calyx teeth obsolete. Petals white, ovate to oblong-ovate. Ovary densely hispidulous. Fruit narrow-oblong, 6–7 × 3–3.5 mm; dorsal ribs thickly protruding, lateral ribs narrow-winged; vitiae 1 in each furrow 2 on commissure. Fl. and fr. Aug–Oct. n = 55*.

- Forests; 1100 m. N Zhejiang (Tianmu Shan).

This rather poorly known species is recorded only from a few collections.


曲柄当归 qu bing dang gui


- Thickets; 900–1100 m. Chongqing (Chengkou).

This poorly known species is recorded only from a few localities. Recent research suggests that it is conspecific with Angelica laxiflora.


毛珠当归 mao zhu dang gui

Angelica genuflexa subsp. refracta (F. Schmidt) M. Hiroe; A. refracta F. Schmidt.

Herbs 0.5–2 m high. Rhizome vertical, 1–1.5 cm thick. Petioles 3–8 cm, sheaths inflated; blade ovate to triangular, 10–40 cm, 1-2-ternate-pinnate, rachis and petioles often geniculate; leaflets sub sessile, lanceolate to ovate-lanceolate, 5–13 × 1–6 cm, margin coarsely mucronulate-serrate, apex acuminate, hispidulous. Peduncles 20–30 cm; hispidulous; bracts absent; rays 20–40, 5–8 cm, unequal; bracteoles many, linear, 11–20 mm, hispidulous; pedicels 5–15 mm. Petals white, ovate, puberulent. Ovary hispidulous. Fruit suborbicular, 4–8 × 3.6–6 mm, pubescent or glabrous; dorsal ribs acute-prominent, lateral ribs broad-winged; vitiae 1 in each furrow, 2 on commissure. Fl. and fr. Jul–Sep.

Forests; 200–300 m. Liaoning [Japan, Russia (Siberia); North America].


天目当归 tian mu dang gui

Plants perennial, 1–2 m. Stem thinly ribbed, pubescent at upper nodes. Basal and lower leaves petiolate, petioles 15–25 cm, sheaths inflated; blade ovate to broad-ovate, 20–30 × 15–30 cm, 2-3-ternate-pinnate, rachis and petioles geniculate; leaflets long-ovate, 3–6 × 1.7–2.5 cm, base cuneate, margin irregularly coarse-serrate, sometimes 1–2-lobed, spiny-hispid along nerves adaxially. Umbels 4–7 cm across; bracts 1, long-ovate, 2–2.5 cm, apex acuminate; rays 14–20, 1.5–3.5 cm, unequal, scabrous; bracteoles 5–7, linear, 5–7 mm, white-scarious-margined, pubescent; umbellules 20–25-flowered; pedicels unequal, pubescent. Calyx teeth obsolete. Petals white, ovate to broad-ovate. Fruit narrow-oblong, 6–7 × 3–3.5 mm; dorsal ribs thickly protruding, lateral ribs narrow-winged; vitiae 1 in each furrow, 2–4 on commissure. Fl. and fr. Aug–Oct. n = 11*.

- Forests; 2400–3600 m. W Hubei (Yichang), E Sichuan.

This poorly known species is recorded only from a few localities.
margin crenate, apex obtuse, hispidulous along nerves and margin. Umbels 6–10 cm across; bracts absent; rays 5–7 cm, thick, unequal and scabrous; bracteoles 6–10, linear, ciliate-acuminate; umbellules 18–40-flowered; pedicels unequal. Calyx teeth obsolete. Petals white or yellowish white, rarely purple-red, long-ovate. Stylopodium dark purple. Fruit oblong to ovoid, 5–6.5 × 3.5–5 mm; dorsal ribs broad, plane, lateral ribs broad-winged, but narrower than the body; vittae 1–2 in each furrow, 2–3 on commissure. Fl. Jul–Aug, fr. Aug–Sep.

- Shrubby thicketts, mountain ravines, meadows; 2600–4000 m. Gansu, Qinghai, Sichuan.

The roots have reputed medicinal properties.


城口当归 chang kou dang gui

Plants perennial, up to 2.5 m. Stem stout, villous below umbel. Leaves petiolate, sheaths ovate, glabrous; blade 2-pinnate, proximal pinnae 3-lobed; leaflets ovate to oblong-ovate, 5–7 × 2–4 cm, base cuneate, margin deeply and irregularly serrate-dentate, apex long-acuminate, glabrous. Peduncles long, villous; bracts absent; rays 15–25, unequal, 2–5 cm, villous; bracteoles ca. 8, lanceolate, apex long-ariate, villous. Calyx teeth obsolete. Petals pinkish-white, obcordate. Youn fruit ovoid-suborbicular (mature fruit unknown); lateral ribs winged; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Aug–Sep.

- Thickets; 1300–1800 m. Chongqing (Chengkou), Hubei, Sichuan (Guanyuan).

This rather poorly known species is recorded only from a few collections. Recent research suggests that it is conspecific with Angelica laxifolia.


峨眉当归 e mei dang gui

Plants perennial, 1.2–2.5 m. Root conic, brown, annular distally, aromatic. Stem purple-green, ribbed, subglabrous. Petioles 5–15 cm, sheaths purple, oblong; blade triangular-long-ovate, 10–18 × 5–12 cm, 2–3-pinnate; leaflets oblong to ovate-oblong, 1.5–5.5 × 0.7–2.5 cm, base often 2-lobed, margin incised-toothed, apex acute to ciliate-acuminate. Umbels 3–6 cm across; peduncles, rays and pedicels hispidulous; peduncles 4–7 cm; bracts absent; rays 14–18(–21), 2–5 cm, ascending; bracteoles 5–12, small, subulate; pedicels 15–23(–27). Calyx teeth obsolete. Petals yellowish-green, ovate, notched. Fruit suborbicular, 4.7–7.5 × 3.5–6 mm; dorsal ribs filiform, lateral ribs broad-winged; vittae 1 in each furrow, 2 on commissure. Fl. Jun–Aug, fr. Aug–Nov. n = 11*.

- Slopes; 400–2000 m. Taiwan.

The roots have reputed medicinal properties. This poorly known species is recorded only from a few collections. Recent research suggests that it is conspecific with Angelica wilsonii (here recognized as A. sinensis var. wilsonii).


长柄当归 chang bing dang gui


Plants perennial, ca. 80 cm. Stem purple-green, ca. 1 cm thick at base, ribbed, branched above. Lower stem leaves petiolate, sheaths inflated; blade pinnate, pinnae 3–4 pairs; leaflets sessile, broadly rhombic-ovate, ca. 4 × 2.5 cm, apical leaflets petiolate, 3-lobed, margin coarsely mucronate-serrate. Bracts absent; rays up to 30, very unequal, to 7 cm when in fruit, scabrid along ribs; bracteoles few, linear; umbellules ca. 40-flowered; pedicels slender, 1–2.5 cm, very unequal. Calyx teeth obsolete. Petals greenish white. Fruit ovoid, 4–5 mm; dorsal ribs filiform, the lateral winged. Fl. and fr. Aug–Sep.

- Forests; ca. 3000 m. Yunnan (Tong Shan).

This rather poorly known species is recorded only from a few collections. Recent work suggests that it is better placed in Ostericum.


太鲁阁当归 tai lu ge dang gui

Plants perennial, 30–50 cm, stout. Root short conic. Petioles 5–10 cm, sheaths inflated; blade ovate, up to 20 × 10–15 cm, pinnate; proximal pinnae 3-lobed, middle and distal pinnae oblong-lanceolate, 5–8 × 1–2 cm, base attenuate or broad-cuneate, margin serrate, apex acuminate. Umbels 10–12 cm across; peduncles ca. 5 cm; bracts linear-lanceolate, ca. 1 cm, deciduous; rays 20–50, unequal, scabrous; bracteoles linear, 4–7 mm, glabrous; pedicels ca. 20, up to 7 mm. Calyx teeth minute, triangular-ovate. Petals white, oblong. Stylodium margin sinuate. Fruit oblong, 5–8 × 3–4 mm, dorsal ribs prominent, lateral ribs broad-winged; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Aug–Oct.

- Slopes; 400–2000 m. Taiwan.

The roots have reputed medicinal properties.


松潘当归 song pan dang gui

Plants perennial, 30–80 cm. Root long-conic, 8–12 cm, yellowish brown, branched. Stem solitiry, purplish green, ribbed, pubescent. Basal leaves petiolate, petioles up to 25 cm, sheaths oblong, purplish striate sheaths; blade 2-pinnate, pinnae 3-paired, glabrous; ultimate segments ovate or long-ovate, 3–7 × 2–3.5 cm, margin serrate. Umbels 6–7 cm across; bracts 2–3, linear, ca. 1.5 cm; rays 20–25, 1–5 cm, very unequal, hispid; bracteoles similar to bracts; pedicels 5–15, 2–7 mm, unequal. Calyx teeth minute, triangular. Petals white, obovate, notched. Fruit subovoid, 6–7 × 3–4 mm; dorsal ribs prominent, lateral ribs winged; vittae 1–2 in each furrow, 2 on commissure. Fl. Oct.

- Forests; 2900–4000 m. N Sichuan (Songpan).

This rather poorly known species is recorded only from a few collections.

管鞘当归 guan qiao dang gui

Plants perennial, 0.6–1.8 m. Root cylindric, yellowish brown, 7–15 × 0.6–1.2 cm. Stem purple-green, scabrous above. Petioles up to 22 cm, sheaths purple, 4–7 cm, narrow-oblong; blade triangular-ovate, 10–14 × 8–15 cm, 2-pinnate; leaflets oblong to oblong-lanceolate, 3–5 × 1.5–3 cm; terminal leaflet base decurrent; basal leaflets 2–3-lobed, margin brown-cuspidate-serrate, apex obtuse-acute, pubescent along nerves. Umbels 4–10 cm across; bracts 2–3, narrow-lanceolate or linear, ciliate, margin purplish; rays 20–60, 2–5.5 cm, unequal, densely pubescent; bracteoles 5–7, similar to bracts; umbellules 16–22-flowered. Calyx teeth obsolete. Petals white, ovate. Fruit suborbicular, 4–5 × 3–4 mm; dorsal ribs filiform, lateral ribs winged, wings narrower than the body; vittae 1 in each furrow, 2 on commissure. Fl. Jul–Aug. fr. Aug–Sep.

● Shrubby thickets, grasslands; 1500–3600 m. W Hubei, Sichuan.


玉山当归 yu shan dang giui

Plants perennial, 1–2 m high. Root thick, short-conic. Stem stout, glabrous or pubescent. Leaves petiolate, petioles ca. 25 cm, sheaths inflated; blade triangular-ovate, up to 25 × 30 cm, 2-pinnate; pinnae petioles ca. 6 cm; leaflets short-petiolulate, oblong, 4–7 × 1.5–3 cm; sometimes 3-lobed, margin serrate, pubescent along nerves abaxially or densely hispid on both sides. Bracts linear, ca. 1.5 cm, deciduous; rays ca. 50, ca. 4 cm; bracteoles several, linear, 2–4 mm; pedicels ca. 30. Calyx teeth obsolete. Petals white, ovate. Fruit orbicular, ca. 5 × 3.5 mm; base cordate; dorsal ribs filiform, lateral ribs broad-winged; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Aug–Sep.

● Alpine grasslands; 3000–3500 m. Taiwan.

The roots have reputed medicinal properties.

1a. Leaves brown-pubescent along nerves abaxially

1b. Leaves densely hispid on both surfaces and rather small

17a. Angelica morrisonicola var. morrisonicola

玉山当归 (原变种) yu shan dang gui (yuan bian zhong)

Peucedanum morrisonicola (Hayata) M. Hiroe.

Leaves brown-pubescent along nerves abaxially.

● Alpine grasslands; 3000–3500 m. Taiwan.


南湖当归 nan hu dang gui


Leaves rather small, densely hispid on both surfaces.

● NE Taiwan (Yilan).


长序当归 chang xu dang gui

Plants perennial, 2.4–2.7 m. Stem stout, ribbed, branched above. Middle and upper cauleine leaves petiolate, sheaths inflated; blade 2–3-pinnate; leaflets short petiolulate or sessile, lanceolate, 5–10 × 2–5 cm, base cuneate or decurrent, margin irregularly serrate and ciliate, apex long caudate-acuminate. Umbels up to 20 cm across; peduncles long; bracts absent; rays ca. 40, unequal, up to 8 cm in fruit; bracteoles several, linear, equaling pedicels; pedicels 25–50, up to 25 mm, subequal, slender, scabrous. Young fruit dorsal ribs prominent, lateral ribs broad-winged (mature fruit unknown); vittae 1 in each furrow. Fl. Jul–Aug.

● Open places; 000–3000 m. Guizhou, W Yunnan (Chimili).

This rather poorly known species is recorded only from a few collections.


林当归 lin dang gui

Plants perennial, 0.8–2 m. Root conic, thick, slightly aromatic. Stem 1–2.5 cm thick, ribbed, pubescent below umbel. Basal and lower leaves petiolate, petioles long, sheaths ovate to saccate-inflated; blade broadly triangular-ovate, 2–3-pinnate; leaflets sessile, lanceolate to ovate, 2.5–8 × 1–4 cm, base cuneate, margin serrulate, slightly hispidulous along nerves. Umbels 10–20 cm across; bracts absent or 1–2, linear, deciduous; rays 15–30, pubescent; bracteoles many, linear, as long as pedicels. Calyx teeth obsolete. Petals white, ovate to obovate. Fruit broad-ovoid, 5–6 × 3.5–5 mm; dorsal ribs filiform, lateral ribs winged; vittae 1 in each furrow, 2 on commissure. Fl. Jun–Jul, fr. Aug–Sep. n = 11*.

Forest margins, damp grasslands, marshy areas, river banks; 900–1100 m. Xinjiang [Russia (Siberia); C and N Europe].

The roots have reputed medicinal properties.


带岭当归 dai ling dang gui

Plants perennial, 1.5–2 m. Stem purple-green, ribbed, branched. Basal and lower leaves petiolate, petioles 10–30 cm, sheaths inflated; blade broad-ovate, 25–60 × 20–50 cm, 3–4-pinnate; leaflets ovate to broad-ovate, 3–7 × 2–5 cm, base oblique, margin coarse-toothed, scabrous along nerves adaxially, glaucous abaxially. Umbels 6–8 cm across; bracts 1, ovate, acuminate, deciduous; rays 20–30, 2–5 cm, unequal; bracteoles ca. 5, linear, ca. 3 mm; pedicels 25–30, unequal. Calyx teeth conspicuous, triangular-ovate. Petals green, obovate. Fruit suborbicular, 5–7 × 5–7 mm; dorsal ribs prominent, lateral ribs broad-winged; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Jul–Sep. n = 11*.

Grassy slopes; ca. 600 m. Heilongjiang (Yichun).

This rather poorly known species is recorded only from a few collections.

秦岭当归 qin ling dang gui

Plants perennial, 60–130 cm. Root conic. Stem glabrous, branched. Basal and lower petioles long, sheathing at base; blade broad-ovate, 1–2-ternate; median leaflets short-petiolulate, rhombic-ovobovate, 7–13 × 5–9 cm, base cuneate; lateral leaflets broad-ovate, often 1–2-lobed, base truncate or slightly cordate, margin incised-serrate, apex acuminate. Peduncles 6–12 cm; bracts absent; rays 20–25, unequal, up to 8 cm in fruit; bracteoles 6–8, linear-lanceolate, 5–8 mm; pedicels 25–35, slender, up to 1 cm. Calyx teeth obsolete. Petals broad-obovate, 3–6 × 3–4 mm; dorsal ribs narrow-winged, lateral ribs conspicuously wider than the dorsal; vittae 2–3 in each furrow, 4 on commissure. Fl. Aug–Sep, fr. Sep–Oct.


三小叶当归 san xiao ye dang gui

Angelica stratoniana Aitchison & Hemsley; Callisace ternata (Regel & Schmalhausen) Koso-Poliansky.

Plants perennial, 40–80 cm, glabrous. Root stout, up to 50 × 2.5 cm, brown, dense annular scars, aromatic. Stem thinly ribbed, branched. Basal and lower petiole sheaths long-ovate; blade broad-triangular, 15–30 × 15–20 cm, 2–3-ternate, pinnae petiolate; leaflets broad-ovate, 3–6 × 1.5–4 cm, base cuneate to cordate, 5–6-basal-nerved, margin irregularly serrulate, apex obtuse-rounded or acute. Umbels 6–12 across; bracts absent; rays 12–23; bracteoles 6–8, lanceolate, reflexed; umbellules 15–25-flowered. Calyx teeth obsolete. Petals white or yellowish green, ovate. Fruit narrow-oblong, 7–11 × 4–6 mm; dorsal ribs and 2 secondary ribs slightly prominent, lateral ribs broadly thick-winged; vittae 1(–2) in each furrow, 4–6 on commissure. Fl. and fr. Jul–Aug. n = 11*.


羽苞当归 yu bao dang gui


Plants perennial, 1–2 m, stout. Root thick, tuberous. Stem 3–6 cm thick. Basal and lower petiole sheaths inflated; blade triangular-ovate, 50–100 cm, ternate-pinnate; leaflets broad-ovate, 15–20 × 10–15 cm, base cordate or rounded, margin obtuse-serrate, apex obtuse, pubescent along nerves on both surfaces. Umbels large, densely pubescent; peduncles 5–15 cm, stout; bracts 1–2 or absent; rays 20–30, 4–7 cm, subequal; bracteoles several, linear-lanceolate, apex acute, pubescent; pedicels 0.5–1 cm, ascending. Calyx teeth obsolete. Petals white, ovate, hirsute abaxially; stamens ca. 2 × petals; stamens subtended by short-conic. Ovary hispid. Fruit oblong, 6–8 × 4–6 mm, pubescent; dorsal ribs obtuse-prominent, the lateral thickly broad-winged; vittae 2–3 in each furrow, 7–8 on commissure. Fl. and fr. Jul–Sep.


长萼当归 long e dang gui

* Heracleum oncosepalum (Handel-Mazzetti) Pimenov & Kliuykov.

Plants perennial, 30–60 cm. Root cylindrical, brownish. Stem solitary, thinly ribbed, villous above. Petioles 8–15 cm, sheaths small, oblong; blade broad-ovate, 9–13 × 8–10 cm, ternate or ternate-pinnate; leaflets short-petiolulate, broad-ovate, 2–3-lobed, base truncate to cordate, margin irregularly coarse-crenate, apex acute, whitish sparse-villous on both surfaces. Peduncles 8–20 cm, villous; bracts 2–3, linear, scabrous, deciduous; rays 13–20, 2–4.5 cm, unequal, villous; bracteoles ca. 5, linear-lanceolate, 0.3–0.5 cm, longer or as long as umbellules; umbellules 10–20-flowered; pedicels pubescent. Calyx teeth conspicuous, triangular-ovate or ovate-lanceolate. Petals white or purplish red, obovate, notched. Fruit obovoid-ovorbicular, 5–6 × 4–5 mm; dorsal ribs and 2 secondary ribs slightly prominent, lateral ribs broadly thick-winged; vittae 1(–2) in each furrow, 3–4(–6) on commissure. Fl. and fr. Aug–Oct. n = 11*.


羽苞当归 yu bao dang gui

Plants perennial, 25–30 cm. Root long-conic, yellowish brown, 4–10 cm. Stem thinly ribbed, pubescent. Basal leaves 5–8, petioles 4–10 cm, sheaths small, ovate; blade 2-ternate-pinnate, pinnae 2–3 pairs; leaflets sessile, broad-ovate to long-ovate, 3–5.5 × 1–2.5 cm, margin serrate, apex acute. Umbels ca. 15 cm across; bracts absent or 1, entire, rays 25–30, 3–7 cm, unequal; bracteoles 5–15, lanceolate, much longer than umbellules, pinnate, rarely 3-lobed or entire; pedicels many, 2–15 mm, unequal. Calyx teeth subulate. Petals white, obovate. Fruit broad-ellipsoid, 3–4 × ca. 3 mm; dorsal ribs prominent, lateral ribs winged, nearly as wide as the body; vittae 1 in each furrow, 2 on commissure. Fr. Oct.

紫花前胡 zi hua qian hu
Plants perennial, 1–2 m high. Root brown, conic, 1–2 cm thick, strongly aromatic. Stem often purple-green, ribbed, glabrous. Petioles 13–36 cm, sheaths purple, elliptic; blade triangular to ovate, 10–25 cm, 1–2-ternate-pinnate; leaflets ovate or oblong-lanceolate, 5–15 × 2–5 cm, base decurrent, margin white-cartilaginous and cupulatate-serrate, apex acute, midribs often purple-green, hispidulous along nerves adaxially. Peduncles 3–8 cm, pubescent; bracts 1–3, purplish, ovate, sheathing, reflexed; rays 10–22, 2–4 cm, pubescent; bracteoles 3–8, linear to lanceolate, green or purple; pedicels pubescent. Calyx teeth triangular-subulate. Petals dark purple, obovate or ellipsoid-lanceolate, apex incurved but not notched. Anthers dark purple. Fruit oblong to ovoid-ribulate, 4–7 × 3–5 mm; dorsal ribs filiform, acute, lateral ribs thickly narrow-winged; vittae 1–3 in each furrow, 4–6 on commissure. Fl. Aug–Sep, fr. Sep–Nov. n = 11*.

Forests, shrubby thickets, slopes, streamssides; 200–800 m. Anhui, Guangdong, Guangxi, Hebei, Henan, Hubei, Jiangsu, Jiangxi, Liaoning, Taiwan, Zhejiang; also NE China [Japan, Korea, Russia (Siberia), Vietnam].


27. Angelica gigas Nakai, Bot. Mag. (Tokyo) 31: 100. 1917. 朝鲜当归 chao xian dang gui

Plants perennial, 1–2 m, stout. Root conic, gray brown, 2–5 cm thick. Stem purplish, ribbed. Basal and lower leaves petiolate, petioles 30–45 cm, sheaths broad; blade triangular-ovate in outline, 20–40 × 20–30 cm, 2–3-ternate-pinnate, basal pinnae petiolarate; leaflets oblong-lanceolate, 4–15 × 1.5–5 cm, base decurrent, margin irregularly coarse-toothed, apex acute, slightly scabrous along nerves adaxially. Upper leaves purple-green, sheaths broadly inflated, often bladeless. Umbel purple, subglobose, 5–8 cm across, up to 12 cm in fruit, peduncles, rays and pedicels all hispidulous; peduncles 2–6 cm; bracts 2, saccate, dark purple; rays many, stout, 2–3 cm; bracteoles dark purple, several, ovate-lanceolate; pedicels many, 3–8 mm. Calyx teeth obsolete. Petals dark purple-red, ovate. Anthers purple. Fruit ellipsoid, 5–8 × 3–5 mm; dorsal ribs prominent, lateral ribs broad-winged; vittae 1(–2) in each furrow, 2(–4) on commissure. Fl. Jul–Aug, fr. Aug–Sep. n = 11*.

Forests, grasslands, streamssides; ca. 1000 m. Heilongjiang, Jilin, Liaoning [Japan, Korea].

The roots are used in traditional Chinese medicine.

Plants perennial, 1–2 m, stout. Roots cylindric, brown, up to 15 × 1–2.5 cm, aromatic. Stem purplish green, up to 1.5 cm thick, thinly ribbed, hirsute above. Basal and lower leaves petiolate, petioles 30–50 cm, sheaths oblong, inflated, 5–7 cm, glabrous or slightly pubescent abaxially; blade broad-ovate, 20–30(–40) × 15–25 cm, 2-ternate-pinnate; leaflets ovate-long-elliptic, 5.5–18 × 3–6.5 cm, base often decurrent along rachis, margin irregularly cuspitate-biserrate, acute acuminate, pubescent along nerves and margin. Petioles 5–16(–20) cm, densely hirsute; bracts 1, long-subulate, ciliate, deciduous; rays 10–25, 1.5–5 cm, densely hirsute; bracteoles 5–10, broad-lanceolate, apex cuspitate, pubescent abaxially; umbrellas 17–28(–36)-flowered. Calyx teeth obsolete. Petals white, ovobateau. Styles conspicuously elongate, reflexed in fruit. Fruit ellipsoid, 6–8 × 3–5 mm; dorsal ribs prominent, lateral ribs broad-winged; vittae 2–3 in each furrow, 2–4(–6) on commissure. Fl. Aug–Sep, fr. Sep–Oct. n = 11*.

・Shrubby thickets, slopes, grasslands; 2000–3400 m. Sichuan.


Plants biennial, 0.5–1.5 m. Root short-conic, branched. Stem often single, thinly ribbed, branched above. Basal and lower leaves petiolate, petioles widening into narrow-ovate sheaths, ca. 5 cm, glabrous, rarely sparse-pubescent abaxially; blade ovate to long-ovate, pinnate or 1–2-ternate-pinnate, pinnate 3–9 pairs; basal pinnate short-petiolulate, 2–3-lobed, the terminal 3-lobed; ultimate segments lanceolate to oblong, 4.9 × 0.8–3 cm, base conspicuously decurrent, margin white-cartilaginous, serrate, apex acute, glabrous or scabrous along midrib. Umbels 3–8 cm across; peduncles 2–6 cm, scabrous; bracts absent; rays 7–14; bracteoles 2–4, linear, scariosus-margined, glabrous; umbrellas 10–25-flowered. Calyx teeth obsolete. Petals white and ovate. Fruit ellipsoid to ovoid, 2.5–4 × 2–3 mm; dorsal ribs prominent, lateral ribs narrow-winged; vittae black-brown, 1–2 in each furrow, 4 on commissure. Fl. Aug–Sep, fr. Sep–Oct.

The roots have reputed medicinal value. 1a. Basal and lower leaves pinnate, ultimate segments lanceolate or ovate-lanceolate, 0.8–2.5 cm wide ........................................ 33a. var. cartilaginomarginata

1b. Basal and lower leaves 2-ternate-pinnate, ultimate segments oblong, 2–3 cm wide .......................... 33b. var. foliosa

33a. Angelica cartilaginomarginata var. cartilaginomarginata

Plants biennial, 1.5–2 m..Root short-conic, branched. Stem often single, thinly ribbed, branched above. Basal and lower leaves petiolate, petioles widening into narrow-ovate sheaths, ca. 5 cm, glabrous, rarely sparse-pubescent abaxially; blade ovate to long-ovate, pinnate or 1–2-ternate-pinnate, pinnate 3–9 pairs; basal pinnate short-petiolulate, 2–3-lobed, the terminal 3-lobed; ultimate segments lanceolate to oblong, 4.9 × 0.8–3 cm, base conspicuously decurrent, margin white-cartilaginous, serrate, apex acute, glabrous or scabrous along midrib. Umbels 3–8 cm across; peduncles 2–6 cm, scabrous; bracts absent; rays 7–14; bracteoles 2–4, linear, scariosus-margined, glabrous; umbrellas 10–25-flowered. Calyx teeth obsolete. Petals white and ovate. Fruit ellipsoid to ovoid, 2.5–4 × 2–3 mm; dorsal ribs prominent, lateral ribs narrow-winged; vittae black-brown, 1–2 in each furrow, 4 on commissure. Fl. August–September, fr. September–October.

Forest margins, shrubby thickets, slopes, grasslands; 300–1000 m. Anhui, Jiangsu.

The roots have reputed medicinal value.

1a. Basal and lower leaves pinnate, ultimate segments lanceolate or ovate-lanceolate, 0.8–2.5 cm wide ........................................ 33a. var. cartilaginomarginata

1b. Basal and lower leaves 2-ternate-pinnate, ultimate segments oblong, 2–3 cm wide .......................... 33b. var. foliosa


The roots are widely used as the important traditional Chinese medicine "du huo," especially as an analgesic and anti-inflammatory in the treatment of rheumatism and rheumatoid arthritis.
Plants perennial, 30–100 cm. Root yellow-brown, 10–25 × 1–2.5 cm, strongly aromatic. Stem solid, purplish, thinly ribbed. Basal and lower leaves petiolate, petioles 10–30 cm, sheaths oblong; blade triangular-ovate, 10–25 cm, 1–2-ternate-pinnate, glabrous; pinnae short-petiolulate, 2–9 × 1–3 cm, 3-lobed, segments lanceolate, margin irregularly acute-serrate, apex acuminate to acute; peduncles 5–20 cm, glabrous or pubescent; bracts absent or 1 to several, linear-lanceolate, 1–2 cm; rays 18–30, unequal, pubescent; bracteoles 5–8, linear, 5–15 mm; umbellules ca. 30-flowered; pedicels slender. Calyx teeth obsolete. Petals white, obovate to oblong. Fruit narrow-oblong, 4–5 × 1–1.5 mm; dorsal ribs filiform, lateral ribs narrow-winged; vittae 1 in each furrow, (2–3–)4 on commissure. Fl. Jul–Aug, fr. Aug–Sep.

Cultivated; ca. 400 m. Jilin [native to Japan and Korea].

The roots are used in Jilin as a regional substitute for the traditional Chinese medicine “dang gui” (see Angelica sinensis).


多茎当归 duo jing dang gui

Angelica tichomirovii V. Vinogradova.

Plants perennial, up to 1 m. Root long-cylindric, brown, distal annular scars. Stem thinly ribbed, branched, glabrous. Basal leaves petiolate, petioles 10–12 cm, sheaths small; blade ovate-orbicular or triangular-ovate, 2–3-ternate-pinnate, pinnae remote, glabrous; leaflets short-petiolulate, ovate or oblong-ovate, 3–6 × 1.8–2.3 cm, base cuneate, margin acute-crenulate. Bracts 5–7, linear-lanceolate, white-margined; rays 10–15, subequal, up to 10 cm in fruit; bracteoles 7–13, lanceolate, white-margined. Calyx teeth obsolete. Petals white or yellowish green. Fruit ellipsoid, 7–11 × 4–7 mm; dorsal ribs filiform, lateral ribs broad-winged; vittae 1 in each furrow, 2 on commissure. Fl. Jul–Aug.

Shrubby thickets, damp areas; 1000–1100 m. N Xinjiang [Russia].


黑水当归 hei shui dang gui

Plants perennial, 60–150 cm. Root conic, black-brown, 1.5–3 cm thick, pungent aromatic. Stem stout, purplish green, puberulous above. Basal and lower leaves long-petiolate, sheaths purplish oblong-ovate; blade broadly triangular-ovate, 20–40 × 20–30 cm, 2–3-ternate-pinnate, pinnae 2–3 pairs, petiolulate; leaflets subsessile, ovate to oblong-ovate, 3–8 × 1.5–4 cm, base cuneate, margin white-cartilaginous and incised-mucronate-serrate, apex acute, pubescent abaxially. Rachis, peduncles, rays and pedicels all densely hispidulous; peduncles 6–20 cm; bracts absent; rays 20–45, subequal; bracteoles 5–7, lanceolate, villous; umbellules 30–45-flowered. Calyx teeth obsolete. Petals white, broad-ovate, ca. 1 mm. Fruit ellipsoid to suborbicular, 5–7 × 3–5 mm; dorsal ribs prominent, lateral ribs broad-winged, wings equal or wider than the body; vittae 1 in each furrow, (2–3–)4 on commissure. Fl. Jul–Aug, fr. Aug–Sep. n = 22.

Forest margins, grassy mountain slopes, stream sides; 500–1000 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Russia (Siberia)].

The young stems are eaten as a spring vegetable, and the roots have reputed medicinal value.


多茎当归 duo jing dang gui

Plants perennial, 1–1.2 m. Root long-cylindric, 10–12 × 2–2.5 cm. Stem thinly ribbed, rarely pubescent. Basal petioles 10–15 cm, puberulent, sheaths oblong; blade triangular-ovate, 20–28 × 15–18 cm, 1–2-ternate-pinnate; leaflets long-ovate, 3–9 × 3–6 cm, base cuneate or truncate, margin obtuse-serrate, 1–2-lobed, apex acuminate. Umbels 12–17 cm across in fruit; bracts absent; rays 50–60, 4–12 cm, unequal, puberulent; bracteoles 5–6,
1a. Fruit ellipsoid or ovate, vittae 1–2 on commissure ........................................ 41a. var. sinensis
1b. Fruit obovoid or suborbicular, vittae absent on commissure ........................................ 41b. var. wilsonii

41a. Angelica sinensis var. sinensis

The roots have reputed medicinal value.

Plants perennial, 0.4–1 m. Root cylindric, branched, rootlets many, succulent, strongly aromatic. Stem purplish green, ribbed, branched above. Basal and lower petioles 5–20 cm, sheaths purplish green, ovate, membranous-margined; blade ovate, 10–30 × 12–25 cm, 2–3-ternate-pinnate; leaflets 3–4 pairs, proximal and middle pinnae long-petiolulate; leaflets ovate or ovate-lanceolate, 2–3.5 × 0.8–2.5 cm, 2–3-lobed, margin irregularly coarse-cuspidate-serrate, sparse papillate-hairy along nerves and margin. Peduncles 8–20 cm, pubescent or subglabrous; bracts absent or 2, linear; rays 10–30, unequal, scabrous; bracteoles 2–4, linear, 3–5 mm; umbellules 13–36-flowered; pedicels slender, 1–3 cm in fruit. Calyx teeth oblong to elliptic, 5–12 × 2–6 cm, irregularly 2–3-lobed, margin acute-serrate, apex acuminate or caudate-acuminate, hispidulous along nerves on both surfaces. Umbels up to 10 cm across; peduncles 4–10 cm, densely brown-hispidulous; bracts absent or 1; rays 20–40, very unequal, densely brown-hispidulous; bracteoles absent; umbellules 16–32-flowered; pedicels glabrous or pubescent. Calyx teeth obsolete. Petals dark purple-red, oblong-ovate. Fruit ovoid or suborbicular, 4.5–7 × 4–6 mm; dorsal ribs prominent, lateral ribs broad-winged, wings wider than the body; vittae 1 in each furrow, 2 on commissure. Fl. Jun–Jul, fr. Sep–Oct.

- Forests, grasslands, streamsides; 1500–2000 m. Sichuan.

The roots are used in Sichuan as a regional substitute for the traditional Chinese medicines “dang gui” (see *Angelica sinensis*) and “du huo” (see *A. biserrata*).


Plants perennial, 80–100 cm. Root brown, conic, branched. Stem thinly ribbed, puberulent. Basal and lower leaves peti-
olate, petioles 7–12 cm, sheaths small; blade broad-ovate, 10–20 cm, 3-ternate-pinnate, pinnae long-petioloate; leaflets sub-sessile, ovate to obovate-lanceolate, 1.5–4 × 0.7–2 cm, base broadly cuneate, margin inconspicuously serrulate, apex acuminate, hispid along nerves adaxially. Peduncles 10–15 cm, pubescent; bracts absent; rays 40–60, 3–6 cm, up to 12 cm in fruit, unequal, scabrous; bracteoles 6–8, linear-lanceolate, apex long-aristate: pedicels 20–30, 3–6 mm, puberulent. Calyx teeth obsolete. Petals white, ovoblate, notched. Fruit ellipsoidal or subbicular, 5–7 mm; dorsal ribs prominent, lateral ribs broad-winged; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Aug–Nov.

- Forests, grassy slopes; 3100–4000 m. Guizhou, Yunnan.


湖北当归 hu bei dang gui

Plants stout. Stem thinly ribbed, pubescent. Leaves petiolate, sheaths inflated; leaf blade 2-ternate-pinnate; leaflets subrhombic or ovate, occasionally 3-lobed, 8–14 × 6–10 cm, margin cuspidate-serrate or biserate, ciliate, apex acute to ciliate-acuminate, ca. 0.5 × pedicels; pedicels numerous, flat, unequal, pubescent. Calyx teeth obtuse. Petals ovate or obovate. Anthers purple-red. Fruit narrowly ellipsoidal, 5–6 × 3–3.5 mm; dorsal ribs filiform, lateral ribs narrow-winged, wings about half as broad as the body; vittae 1 on each furrow, 4 on commissure. Fl. Aug.

- Forests; 1000–1600 m. W Hubei.

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


白芷 bai zhi

Plants perennial 1–2.5 m, stout. Root cylindric, brown, 3–5 cm thick, strongly aromatic. Stem purplish green, 2–5(–7–8) cm thick, ribbed, pubescent above. Basal and lower leaves long-petioloate, sheaths oblong-inflated, glabrous; blade triangular-ovate, 30–50 × 25–40 cm, 2–3-ternate-pinnate; leaflets sessile, oblong-elliptic to oblong-lanceolate, 4–10 × 1–4 cm, base slightly decurrent, margin white-cartilaginous and coarse-cuspidate-serrate, apex acute, pubescent along nerves adaxially. Upper leaves reduced, sheaths saccate-inflated, bladeless. Umbels 10–30 cm across; peduncles 5–20 cm, scabrous; bracts absent or 1–2, like uppermost leaves; rays 18–40(–70), short-hairy; bracteoles many, linear-lanceolate, scarious; pedicels many, scabrous. Calyx teeth obsolete. Petals white, ovate or obtuse and notched. Ovary glabrous or pubescent. Fruit suborbicular, 4–7 × 4–6 mm; dorsal ribs prominent, obtusely thick-rounded, much wider than furrows, lateral ribs broad-winged; vittae 1 in each furrow, 2 on commissure. Fl. JUL–Aug. Fl. Aug.–Sep.

Forest margins, valley grasslands, streamsides; 500–1000 m. Hebei, Heilongjiang, Jilin, Liaoning, Shaanxi, N Taiwan [Japan, Korea, Russia (Siberia)].

This species is widely cultivated in N China, where the roots are used as the important traditional Chinese medicine “bai zhi” and as a substitute, known as “dong bei da huo,” for the traditional Chinese medicine “du huo” (see *Angelica biserrata*). Two cultivars are common: *A. dahurica* ‘Hangbaizhi’ and *A. dahurica* ‘Qibaizhi’.

45a. *Angelica dahurica* var. *dahurica*

Ovary and fruit pubescent (NE China) ...

45a. var. *dahurica* 1b. Ovary and fruit pubescent (Taiwan) ...

45b. *Angelica dahurica* var. *formosana*

白芷(原变种) bai zhi (yuan bian zhong)

*Callisace dahurica* Fischer ex Hoffmann, Gen. Pl. Umbell., ed. 2, 170, 1816; *Angelica macrocarpa* H. Wolff; *A. porphyrocaulis* Nakai & Kitagawa; *A. porphyrocaulis* var. *albiflora* (Maximowicz) Makino; *A. tshiliensis* H. Wolff

Ovary and fruit glabrous. *n = 11*.

Forest margins, valley grasslands, streamsides; 500–1000 m. Hebei, Heilongjiang, Jilin, Liaoning, Shaanxi [Japan, Korea, Russia (Siberia)].


台湾当归 tai wan dang gui


Plants stout. Upper umbels densely pubescent, lower umbels glabrous or sparsely pubescent. Ovary and fruit pubescent.

- Forest margins; 600–800 m. N Taiwan.


山芹属 shan qin shu

Pan Zehui (潘泽惠); Mark F. Watson

*Gomphopetalum* Turczanzinow.

Herbs, perennial. Stem hollow, ribbed. Petiole sheaths inflated; leaf blade 2–3-ternate-pinnate. Umbels compound, terminal and lateral; bracts few, lanceolate or linear-lanceolate; bracteoles several, linear to linear-lanceolate. Calyx teeth conspicuous, triangular or ovate. Fruit oblong-ovoid, base cordate, flattened dorsally; surface covered with many convex and shining dots; dorsal ribs prominent, the lateral broadly thin-winged; vittae 1–3 in each furrow, 2–8 on commissure; mesocarp thin, hollow in mature fruit. Seed face plane. Carpophore 2-cleft to base.

About ten species: C and E Asia, E Europe; seven species (three endemic) in China.

*Ostericum* is closely allied to *Angelica*; see the taxonomic comment under that genus.
1a. Ultimate leaf segments linear or oblong-lanceolate, entire or inconspicuously serrate.

2a. Ultimate leaf segments entire; bracts 1–3, 5–8 mm .......................................................... 1. *O. maximowiczii*

2b. Ultimate leaf segments margin inconspicuously serrate; bracts 6–8, ca. 4 mm ............................................. 2. *O. citriodorum*

1b. Ultimate leaf segments ovate to broad-elliptic, margin serrate, crenate or incised.

3a. Central umbels with short peduncles, lateral umbels opposite or cyclic with long peduncles; petals green ... 3. *O. viridiflorum*

3b. Central umbels with long peduncles, lateral umbels not opposite nor cyclic, with short peduncles; petals white.

4a. Fruit vittae 1–3 in each furrow, 4–8 on commissure.

5a. Bracts 2–5; fruit suborbicular, 5–7 mm .......................................................... 4. *O. scaberulum*

5b. Bracts 1–2; fruit ellipsoid, 4–5.5 mm .......................................................... 5. *O. sieboldii*

4b. Fruit vittae 1 in each furrow, 2 on commissure.

6a. Petioles acute-triangular; bracts 1–4, unequal, apex long-aristate ............................................. 6. *O. huadongense*

6b. Petioles rounded; bracts 4–8, equal, apex acute ............................................. 7. *O. grosseserratum*


全叶山芹  quan ye shan qin

Plants 40–100 cm. Rhizome inconspicuous or slender and creeping. Stem 2–5 mm thick, thinly ribbed, sparingly branched above, glabrous or sparsely hispidulous. Basal and lower leaves petiolate, petioles 3–10 cm, sheaths narrow; blade triangular-ovate, 7–16 × 5–13 cm, 2–4-ternate-pinnate; ultimate segments linear to ovate-lanceolate, 1–4 × 0.5–0.9 mm, glabrous or hispidulous along nerves. Middle and upper leaves reduced, sheaths purplish, inflated. Umbels 3.5–7 cm across; bracts 1–3, broad-lanceolate, 5–8 mm, scarious-margined; rays 10–17, hispidulous; bracteoles 5–7, linear-lanceolate, acuminate; umbellules 10–30-flowered; pedicles glabrous. Calyx teeth broadly triangular-ovate, hispidulous. Petals suborbicular, base clawed. Fruit broad-ovoid, 4–5.5 × 3.5–5 mm; dorsal ribs prominent, marginal ribs broad-winged, broader than the body; vittae in each furrow, 2–4 on commissure. Fl. Aug–Sep, fr. Sep–Oct.

Forests, grasslands, river banks; 2200–2300 m. Heilongjiang, Jilin, Sichuan [Korea, Russia].


大全叶山芹 da quan ye shan qin


Ultimate leaf segments 5–9 mm wide.

Forests, damp meadows. Heilongjiang, Jilin [Korea, Russia].


丝叶山芹 si ye shan qin


Rachis, petioles and petiolules geniculate.

- Forests, damp grasslands, river banks. Heilongjiang.


高山全叶山芹 gao shan quan ye shan qin

Rhzome inconspicuous, root slender, brown; rays less than 10.

- Grasslands in mountains; 2200–2300 m. Sichuan.

This is a rather poorly known taxon, and recent work suggests that it is conspecific with *Pachypleurum multiense*; see the note under that species.


隔山香 ge shan xiang

*Angelica citriodora* Hance, J. Bot. 131. 1871.

Plants 0.5–1.3 m, glabrous. Root short-conic, brown, crown surrounded by fibrous remnant sheaths. Stem 2–5 mm thick, branched above. Petioles 5–30 cm, sheaths triangular-ovate, 0.5–1.5 mm; blade oblong-ovate to broadly triangular-ovate, 15–22 × 13–20 cm, 2–3-ternate-pinnate; leaflets subsessile, oblong-lanceolate to lanceolate, 3–6.5 × 0.4–2.5 cm, mar-


Ultimate leaf segments linear or linear-lanceolate, 1–4 mm wide. n = 11*.
gin inconspicuously serrulate, apex acute and mucronate. Peduncles 6–9 cm; bracts 6–8, lanceolate, ca. 4 mm, multi- striate; rays 5–12; bracteoles 5–8, linear, 2–3 mm, reflexed. Calyx teeth conspicuous, triangular-ovate. Petals white, ovate, apex in flexed. Fruit ellipsoid to broad-ovoid, 3–4 × 3–3.5 mm, y ellowish brown; dorsal ribs prominent, lateral ribs broad-winged, wings wider than the body; vittae 1–3 in each furrow, 2 on commissure. Fl. Jun–Aug, fr. Aug–Oct.

- Forest margins, shrubby thickets, grasslands; 800–1200 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Zhejiang.

The roots are used in traditional Chinese medicine as an analgesic and antipyretic.


绿花山芹 là hua shan qin


Plants 0.5–1 m. Root conic, yellowish brown, branched. Stem purplish green, acute-angled, pubescent. Petioles ca. 10 cm, acute-triangular, sheaths triangular-ovate; leaf blade triangular-ovate, 10–15 × 15–20 cm, 2-pinnate, pinnae long-petiolulate; leaflets sub sessile, ovate or oblong, 4–7(–10) × 2(–4) cm, base truncate or obliquely broad-cuneate, margin white cuspidate-serrate, apex acuminate, scabrous along nerves abaxially. Central umbels 4–9 across, peduncle very short, lateral umbels opposite or cyclic, peduncles longer, scabrous; bracts 2–3, lanceolate, ca. 1 cm; rays 10–18, 1–2 cm, unequal, hispidulous; bracteoles 3–9, linear-lanceolate; umbellules 10–20-flowered; pedicels hispidulous. Calyx teeth ovate. Petals green or greenish white, ovate. Fruit ellipsoid-ortibicular, 4–6 × 2.5–4 mm; dorsal ribs acute-prominent, lateral ribs broad-winged; vittae 1–3 in each furrow, 2 on commissure. Fl. Jul–Aug, fr. Aug–Sep. n = 11*.

Damp meadows, riversides, stream banks; 800–1100 m. Heilongjiang, Jilin, Liaoning [Russia (Siberia)].

The young plants are eaten as a spring vegetable.


疏毛山芹 shu mao shan qin


Plants 0.5–1.5 m. Root stout, brown, 2–3-branched. Stem ribbed, glabrous or sparsely pubescent. Petioles acute-triangular in cross section, 5–20 cm, sheaths triangular-ovate; leaf blade triangular-ovate, 20–45 × 17–40 cm, 2–3-ternate-pinnate; leaflets subsessile or short-petiolulate, long-ovate to elliptic, 2.5–12 × 1–6 cm, base obliquely cordate to cuneate, margin coarsely-toothed or serrate, apex acuminate, glabrous or hispidulous along nerves. Umbels 4–8 cm across; bracts 1–2, narrow-lanceolate; rays 7–13, unequal, scabrous; bracteoles 6–10, linear-lanceolate, unequal; umbellules ca. 20-flowered; pedicels glabrous. Calyx teeth ovate. Petals white, broad-ovate. Fruit ellipsoid, 4–5.5 × 3.5–4 mm; dorsal ribs prominent, lateral ribs broad-winged; vittae 1–3 in each furrow, 4–6(–8) on commissure. Fl. Aug–Sep, fr. Sep–Oct.

Forests, shrubby thickets, grasslands; 2700–3400 m. Yunnan.

The roots are used in traditional Chinese medicine as an analgesic and antipyretic.

1a. Bracteoles linear, ca. 0.5 mm wide, usually shorter than pedicels. 4a. var. scaberulum

1b. Bracteoles linear, ca. 1 mm wide, 1–1.5 × pedicels. 4b. var. longiinvolucellatum

4a. Ostericum scaberulum var. scaberulum

疏毛山芹（原变种）shu mao shan qin (yuan bian zhong)


Bracteoles linear, ca. 0.5 mm wide, usually shorter than pedicels.

- Forests, grasslands; 2500–3300 m. Yunnan.

4b. Ostericum scaberulum var. longiinvolucellatum

长毛山芹 chang mao shan qin

Bracteoles linear, ca. 1 mm wide, 1–1.5 × pedicels.

- Shrubby thickets, meadows; 2700–3400 m. Yunnan.


山芹 shan qin

Plants 0.5–1.5 m. Root stout, brown, 2–3-branched. Stem ribbed, glabrous or sparsely pubescent. Petioles acute-triangular in cross section, 5–20 cm, sheaths triangular-ovate; leaf blade triangular-ovate, 20–45 × 17–40 cm, 2–3-ternate-pinnate; leaflets subsessile or short-petiolulate, long-ovate to elliptic, 2.5–12 × 1–6 cm, base obliquely cordate to cuneate, margin coarsely-toothed or serrate, apex acuminate, glabrous or hispidulous along nerves. Umbels 4–8 cm across; bracts 1–2, narrow-lanceolate; rays 7–13, unequal, scabrous; bracteoles 6–10, linear-lanceolate, unequal; umbellules ca. 20-flowered; pedicels glabrous. Calyx teeth ovate. Petals white, broad-ovate. Fruit ellipsoid, 4–5.5 × 3.5–4 mm; dorsal ribs prominent, lateral ribs broad-winged; vittae 1–3 in each furrow, 4–6(–8) on commissure. Fl. Aug–Sep, fr. Sep–Oct.

Forests, ravines, grassy slopes, grasslands; 600–1200 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong [Japan, Korea, Russia].

5a. Ostericum sieboldii var. sieboldii

山芹（原变种）shan qin (yuan bian zhong)


Leaflets short-petiolulate, ovate, 5–12 × 3–6 cm, base oblique cordate. \( n = 11^* \).

Forests, ravines, grassy slopes; 600–1200 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shandong [Japan, Korea, Russia].

The young plants are eaten as a spring vegetable, and the roots have reputed medicinal value as a regional substitute for the traditional Chinese medicine “du huo” (see \textit{Angelica biserrata}).


Leaflets sessile, elliptic or rhombic-ovate, 2.5–8 × 1–3 cm, base cuneate.

Forests, grasslands; 800–1000 m. Heilongjiang, Jilin, Nei Mongol, Shaanxi [Korea].


华东山芹 

Plants 60–90 cm. Stem ribbed, branched. Basal and lower leaves petiolate, petioles 6–15 cm, acute-triangular, sheaths small, narrow-ovate; blade triangular-ovate, 15–20 × 12–18 cm, 2-ternate-pinnate, pinnae petiolulate; leaflets sub sessile, broad-ovate to rhombic-ovate, 2.5–5 × 1.8–3 cm, base oblique cuneate or broad-cuneate, margin cartilaginous, not divided or 1–2-lobed, coarsely cuspidate-dentate, apex short-acuminate, slightly scabrous along nerves abaxially. Umbels 2–10 cm across; bracts 4–8, linear-lanceolate to lanceolate, 5–8 mm; rays 6–14, 1.5–3 cm, unequal, scabrous; bracteoles 5–10, subulate to linear-lanceolate. Calyx teeth triangular-ovate, acute. Petals white, obovate, base clawed. Fruit broad-ellipsoid, 4.6–4.5 × 5.5 mm; dorsal ribs prominent, lateral ribs broad-winged; vittae 1 in each furrow, 2 on commissure. Fl. Jul–Sep, fr. Aug–Oct. \( n = 9^* \).

Grassy slopes, meadows, stream banks; 300–2400 m. Anhui, Fujian, Hebei, Henan, Jiangsu, Jilin, Liaoning, Qinghai, Shaanxi, Shanxi, Sichuan, Zhejiang [Korea, Mongolia].

All parts of the species contain aromatic oil and the roots have reputed medicinal value. In some regions they are used as asubstitute for the traditional Chinese medicine “du huo” (see \textit{Angelica biserrata}).

84. \textbf{LEVISTICUM} Hill, Brit. Herb. 423 (not 410). 1756, nom. cons.

欧当归属 

\textit{ou dang gui shu}

Pan Zehui (潘泽惠); Mark F. Watson

\textit{Hipposelinum} Britton & Rose.

Herbs perennial, stout. Leaves 2-3-pinnate. Umbels compound, terminal and lateral; bracts and bracteoles several. Calyx teeth obsolete. Petals yellowish green to yellow, elliptic, apex incurved. Fruit ellipsoid, slightly flattened dorsally; dorsal ribs prominent, lateral ribs broad-winged; vittae 1 in each furrow, 2 on commissure. Seed face plane. Carpophore 2-cleft to base.

Three species: Afghanistan, SW Asia, Europe, North America; one species (introduced) in China.


欧当归 

\textit{ou dang gui}


Plants 1–2.5 m, aromatic. Rhizome stout, 4–5 cm thick. Stem purplish green, lower branches alternate, upper branches opposite or whorled. Basal and lower leaves long-petiolate, angular-ovate. Petals white obovate, notched. Anthers purple. Fruit ellipsoid, 7–8 × 4–5 mm; dorsal ribs prominent, lateral ribs broad-winged; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Aug–Oct. \( n = 11^* \).

- Forests or grasslands in ravines; 400–600 m. Anhui, Jiangsu, Zhejiang.


大齿山芹 da chi shan qin


Plants 80–120 cm. Root cylindric, brown, simple or branched. Stem thinly ribbed, base purplish green, branched above. Basal and lower petioles 4–18 cm, sheaths narrow-ovate, white-membranous-margined; leaf blade broadly triangular-ovate, 2–3-ternate-pinnate, primary and secondary pinnae petiolulate; leaflets sub sessile, broad-ovate to rhombic-ovate, 2.5–1.5–3 cm, base cuneate, margin 2–4-lobed, coarsely white-membranous-toothed, apex acute to long-acuminate, hispidulous along nerves on both surfaces. Umbels 2–10 cm across; bracts 4–8, linear-lanceolate to lanceolate, 5–8 mm; rays 6–14, 1.5–3 cm, unequal, scabrous; bracteoles 5–10, subulate to linear-lanceolate. Calyx teeth triangular-ovate, acute. Petals white, obovate, base clawed. Fruit broad-ellipsoid, 4.6–4.5 × 5.5 mm; dorsal ribs prominent, lateral ribs broad-winged; vittae 1 in each furrow, 2 on commissure. Fl. Jul–Sep, fr. Aug–Oct. \( n = 9^* \).

Widely cultivated; 100–600 m. Hebei, Henan, Jiangsu, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi [native to SW Asia and Europe].

This species was introduced to China in 1957. It is used as a sub-
stitute for the traditional Chinese medicine “dang gui” (see *Angelica sinensis*) and for flavoring. The young shoots and leaves can be eaten as a vegetable.


珊瑚菜属 shan hu cai shu

Pan Zehui (潘泽惠); Mark F. Watson

*Phellopterus* Bentham.

Herbs, perennial, white-pubescent throughout. Stem strongly shortened, branched. Leaves long-petiolate, sheathing at base; blade 1–2-ternate. Umbels compound, terminal and lateral, crowded; bracts absent; rays unequal; bracteoles several, lanceolate; umbellules subcapitate; pedicels inconspicuous. Calyx teeth minute, ovate-lanceolate. Petals white or purple-red, obovate-lanceolate, hairy abaxially, apex incurved. Stylodium short-conic. Fruit obovoid to subglobose, slightly flattened dorsally, densely hisrate and velutinous; ribs all corky-winged, equal or lateral ribs slightly broader than the dorsal; vittae 1–3 in each furrow, 2–6 on commissure. Seed face subplane. Carpophore 2-cleft.

Two species: E Asia, North America; one species in China.


珊瑚菜 shan hu cai

*Phellopterus littoralis* (F. Schmidt ex Miquel) Bentham.

Plants 20–70 cm. Tap root elongate, cylindrical or fusiform, 20–70 × 0.5–1.5 cm, yellowish white. Basal and lower leaves long-petiolate, 5–15 cm; blade broad-ovate, 1–2-ternate; ultimate segments oblong to broadly obovate, 1–6 × 0.8–3.5 cm, scabrous along nerves, incised-serrate with white-coriaceous-margins, apex obtuse-rounded. Umbels 3–6 cm across; peduncles 2–6 cm; rays 8–16, 1–3 cm, unequal; bracteoles linear-lanceolate; pedicels 15–20. Calyx teeth 0.5–1 mm. Fruit 6–13 × 6–10 mm. Fl. and fr. June–Aug. *n* = 11*.

Sandy beaches, also cultivated in sandy soils; 50–100 m. Fujian, Guangdong, Hebei, Jiangsu, Liaoning, Shandong, Taiwan, Zhejiang [Japan, Korea, Russia].

The roots are used in traditional Chinese medicine for treating coughs.


弓翅芹属 gong chi qin shu

She Menglan (佘孟兰 Sheng Meng-lan); Mark F. Watson

*Herbs, perennial, glabrous throughout. Stem solitary, erect or scrambling, hollow. Basal leaves long-petiolate, 2–3-pinnatisect, petiole sheathing; ultimate segments linear-lanceolate, apex long-acuminate or caudate, base attenuate or obtuse-rounded. Inflorescence loose compound umbels, peduncles terminal and axillary, many-branched, lateral umbels usually exceeding central; bracts and bracteoles absent, or occasionally bracts 1, deciduous; rays usually slender, unequal. Calyx teeth minute, triangular. Petals white, purplish or dull cream, obovate, apex broadly inflexed, costa reddish brown, conspicuous, base clawed. Stylodium conic or low-conic, margin slightly undulate. Fruit oblong or ellipsoid, strongly dorsally compressed; dorsal ribs obscure or very slightly raised, lateral ribs broadly winged, wings thin to corky, margin often incurved; vittae 1 in each furrow, 2 on commissure. Seed face plane. Carpophore 2-cleft.*

Three to five species: E Himalayas and SW China: three species (two endemic) in China.

Generic relationships between *Angelica*, *Arcuatopterus*, *Ferula*, *Peucedanum sensu lato*, etc. continue to be explored, with recent results indicating that several Himalayan taxa should now be included within *Arcuatopterus*, a genus once thought to be endemic to SW China.

1a. Fruit reddish brown when mature, less than 6 × 4 mm ............................................................................................ 1. *A. sikkimensis*

1b. Fruit not reddish brown when mature, more than 6 × 4 mm.

2a. Ultimate leaf segments linear-lanceolate, apex long-acuminate or caudate, base attenuate or obtuse-rounded

.............................................................................................................................................................................. 2. *A. linearifolius*

2b. Ultimate leaf segments ovate or obovate, apex acute or acuminate, base cuneate ........................................... 3. *A. thalictroides*


弓翅芹 gong chi qin


Plants 80–100(–200) cm. Stem much-branched, erect, weakly erect or scrambling, lower parts tinged purple when young, becoming deep purplish-red throughout. Basal leaves ovate in outline, 18–40 × 8–25 cm, 2–3-pinnate; ultimate segments long-ovate or ovate-lanceolate, 1.2–6 × 0.5–2 cm, petiolate, base rounded to cuneate, irregularly serrate, acuminate to long-acuminate. Umbels diffusely branched, 5–15 cm across; rays 6–12(–16), very unequal, 0.5–5.5 cm; umbellules 5–14-flowered; pedicels filiform, 3–8 mm, unequal. Fruit ovoid-ellip-
soid or ellipsoid, 5–6.5(–7.5) × 3.5–5(–6) mm, glabrous, red-
dish brown when mature; dorsal ribs obscure, lateral wings
broad, subcorky, 1.2–2 mm wide, margin incurved. Fl. Aug–

Mountain slopes, woodland; (1500–)2200–3000 m. SE Xizang,
NW Yunnan (Binhuan, Lijiang) [Bhutan, Sikkim].


条叶弓翅芹 tiao ye gong chi qin

Herbs 50–120 cm. Stem erect, much-branched, usually ting-
ed purple. Basal leaves petiolate; blade triangular-ovate, 2–3-
pinnately dissected; ultimate segments linear-lanceolate, 2–9 ×
3–6 mm, distally finely serrate to incised, apex long-acuminate
to caudate. Cauline leaves reduced, petioles with dilated sheaths,
3–6 mm, distally finely serrate to incised, apex long-acuminate
pinnately dissected; ultimate segments linear and small. Inflorescence
copiously branched; rays 5–11, unequal, 0.5–4 cm; umbellules 7–10-flow-
ered; pedicels filiform, unequal. Stylodium low-conic; styles
short, recurved. Fruit ellipsoid ca. 6 × 4–5 mm; dorsal ribs in-
conspicuous or slightly raised, lateral ribs winged, wings broad,


阿魏属 a wei shu
She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Euryangium Kauffmann; Sumbulus H. Reinsch.

Herbs, perennial, monocarpic or polycarpic, often onion-
(Allium)-scented. Taproot stout, often woody. Stem branching, alter-
nate, opposite or verticillate, base often clothed in fibrous remnant sheaths. Leaves petiolate, base sheathing, usually broadly so;
blade 2–4-pinnate or 2–4-pinnatisect. Cauline leaves reduced upwards. Inflorescences often polygamous, terminal umbils com-
pound, flowers perfect; lateral umbils both compound and simple, flowers bissexual or stamine; bracts usually absent; bracteoles
present or absent. Calyx teeth obsolete or minute, triangular (except F. kingdon-wardii). Petals yellow or pale yellow (rarely green-
ish-yellow), ovate or lanceolate-oblong, apex acuminate, inflexed. Stylodium conic, base sometimes dilated, lobed. Fruit ellipsoid
or ovate-globose, strongly dorsally compressed, glabrous (rarely sparsely puberulent); dorsal ribs filiform, usually prominent, lateral
ribs winged, wings narrow or broad; vittae 1–4 in each furrow, 2–12 on commissure. Seed face plane or slightly concave. Carpophore
2-cleft to base.

About 150 species: N Africa, C and SW Asia, Mediterranean region; 26 species (seven endemic) in China.

1a. Inflorescence of compound and simple umbels, compound umbels terminal, simple umbels axillary, opposite or
successively verticillate forming crowded moniliform racemes.

2a. Stem 1–1.5 m, stout, simply branched ........................................................................................................ 24. F. furulooides

2b. Stem 0.3–0.6 m, slender, duplicately branched.

3a. Leaves roughened, hispid and deciduous; fruits ca. equal to pedicels ........................................................................ 25. F. caspica

3b. Leaves adaxially glabrous, abaxially pubescent, not deciduous; fruits longer than pedicels ......................................... 26. F. dubianskyi

1b. Inflorescence of only compound umbels in an ample loose panicle.

4a. Petals persistent for a long time after flowering; polycarpic; vittae 3–4 in each furrow, 10–12 on commissure

............................................................ 10. F. lehmannii

4b. Petals deciduous after flowering, monocarpic or polycarpic.

5a. Stem stout, spongy; leaves usually smooth, not papilllose, deciduous.

6a. Segments of leaves larger, oblong-ovate, more than 5 cm.

7a. Plants strongly onion-scented; stem elongate-conic; fruit ribs narrowly winged ........................................... 1. F. conoaula

7b. Plants not onion-scented; stem terete; fruit ribs broadly winged ............................................................. 2. F. jaeschkeana

6b. Segments of leaves smaller, shapes various, less than 5 cm.

8a. Petals abaxially glabrous ......................................................................................................................... 9. F. canescens

8b. Petals abaxially pubescent.

9a. Stem slender, suberect or flexuose, 15–50 cm high, plants not onion-scented.
10a. Plants 15–30 cm; bracteoles densely white villous; fruits 5–8 mm, longer than pedicels; vittae 2 on commissure. 7. *F. syreitschkikowii*

10b. Plants ca. 50 cm; bracteoles glabrous; fruits 8–10 mm, shorter than pedicels; vittae 2–6 on commissure. 8. *F. hexiensis*

9b. Stem stout, erect, above 1 m high, plants strongly onion-scented.

11a. Segments of leaves lobbed or toothed; fruit vittae 3–5 in each furrow, 10–14 on commissure.

11b. Segments of leaves lanceolate; fruit vittae 1–2(–3) in each furrow, 6 on commissure.

12a. Stem roughened, pubescent; mature fruits 10–12 mm, equaling or shorter than pedicels. 3. *F. sinkiangensis*

12b. Stem subglabrous; mature fruits 12–16 mm, longer than pedicels. 4. *F. fukanensis*

5b. Stem slender, not spongy; leaves roughened; usually papillose, persistent until plant has withered.

14a. Leaves thick, sub-leathery, rigid, not deciduous.

14b. Leaves thin, papery, flexible, deciduous.

15a. Ultimate leaf segments linear, 1–2 mm, branchlets often verticillate; bracteoles deciduous. 14. *F. dissecta*

15b. Ultimate leaf segments elliptic or ovate, never linear.

16a. Plants low, 30–60 cm, leaves densely puberulous, bluish green; rays 4–15, spreading, unequal; lateral umbel absent. 11. *F. bungeana*

16b. Plants tall, 1–3 m, leaves roughened, hispid or sparingly pubescent; lateral umbel present.

17a. Ultimate leaf segments 5–10 mm, toothed or lobed; fruit vittae 4–8 on commissure. 12. *F. ovina*

17b. Ultimate leaf segments 20–30 mm, parted, lobules entire or serrate; fruit vittae 2 on commissure. 13. *F. lapidosa*

18a. Ultimate segments linear or lanceolate.

18b. Ultimate segments elliptic-ovate, never linear or lanceolate.

19a. Leaves ternate-3–4-pinnatisect, ultimate segments up to 30 mm. 20. *F. songarica*

19b. Leaves 2–3-pinnatisect, ultimate segments 2–10 mm.

20a. Plants sparsely pubescent, leaves adaxially glabrous, abaxially pubescent; fruit 5–7 mm, vittae 2 on commissure. 21. *F. gracilis*

20b. Plants glabrous; fruit (7–)10–15 mm, vittae 4–8 on commissure. 22. *F. licentiana*

22a. Leaf blade 2–3-pinnatisect, ultimate segments oblong, 0.3–1 × 0.2–0.6 cm; calyx teeth conspicuous, long-triangular. 17. *F. olivacea*

22b. Leaf blade 3-pinnate, ultimate segments long-ovate or broadly ovate; calyx teeth obsolete or rarely subulate. 18. *F. kingdon-wardii*

21a. Plants glabrous.

23a. Leaves adaxially glabrous, abaxially pubescent, articulate between petiole and blade.

24a. Stem 0.5–1 m, 1 × branched; leaf blade ternate-pinnate, pinnae pinnately parted; lateral umbels single. 15. *F. moschata*

24b. Stem 2–3 m, 2 × branched; leaf blade ternate-3-pinnatisect; lateral umbels absent. 16. *F. kirialovii*

23b. Leaves roughened, hispid, not articulate between petiole and blade.

25a. Leaves adaxially glabrous, abaxially sparsely hirsute, basal leaves long-petiolate; bracteoles persistent. 19. *F. akitschakensis*

25b. Leaves hispid on both surfaces, basal leaves sessile or short-petiolate; bracteoles deciduous. 23. *F. karataviensis*


圆形茎阿魏 yuan zhi jing a wei

Plants ca. 2 m, monocarpic, strongly onion-scented. Stem solitary, very stout, up to 15 cm thick at base, tapering towards apex, hispid, paniculate-branched, branches thick, lower branches alternate, upper branches verticillate, purplish tinged with age. Basal leaves petiolate; blade triangular in outline, ternate-pinnatifid; ultimate segments lanceolate or lanceolate-elliptic, to 27 × 7 cm, finely crenate, adaxially glabrous, abaxially densely puberulous. Cauline leaves reduced with expanded sheaths, uppermost almost wholly sheathing. Terminal umbels often sessile or short-pedunculate, lateral umbels long-pedunculate, usually exceeding terminal; umbels 8–14 mm across; bracts absent; rays 12–50, subequal; bracteoles few, lanceolate, small, deciduous; umbellules ca. 15-flowered. Stylodium long-conic, base dilated; styles elongate, recurved. Fruit ellipsoid, ca. 10 × 5 mm; vittae 1–2 in each furrow, 8–14 on commissure. Fl. May–Jun, fr. Jun–Jul.

Mountain valleys, semi-deserts; ca. 2800 m. SW Xinjiang (Wu-qia) [Kyrgyzstan].

This species is used in Xinjiang as a regional substitute for the traditional Chinese medicine “a wei” (*Ferula asafoetida* Linnæus).


中亚阿魏 zhong ya a wei

*Ferula jaeschkeana* var. *parkeri*ana O. E. Schulz; *Peucedanum jaeschkeanum* (Vatke) Baillon.

Grassy slopes, among shrubs; ca. 3600 m. W Xizang (Ngari, Zanda) [Afghanistan, Bhutan, NE India, W Pakistan; C Asia].


新疆阿魏 xin jiang a wei

Plants 0.5–1.5 m, strongly onion-scented. Rootstock thick, conical. Stem stout, pubescent, paniculate-branched, lower branches alternate, upper branches verticillate, often purplish red. Leaf blade gray-green, triangular-ovate in outline, ternate-3-pinnatisect; ultimate segments broadly elliptic, ca. 10 mm, shallowly lobed or toothed, base decurrent, axially sparsely pubescent, abaxially densely puberulent. Terminal umbel sub sessile, lateral umbels (1–)2–4, opposite or alternate, peduncles elongate, exceeding terminal; umbels 8–12 cm across; bracts absent; rays 5–25, puberulent; bracteoles broadly lanceolate, deciduous. Petals abaxially puberulous. Stylodium low-conic, base dilated, undulated-margined. Fruit ellipsoid, 12–15 × 6–6 mm, sparsely puberulent; vittae 3–4 in each furrow, unequal, 12–14 on commissure. Fl. and fr. Apr–Jun.

Desert gravels; ca. 900 m. N Xinjiang (Illi) [Kazakhstan, Russia].

This species has reputed medicinal value.


托里阿魏 tuo li a wei

Plants 0.5–1.5 m, strongly onion-scented. Taproot fusiform, thickened. Stem solitary, stout, conspicuously fluted, pubescent, paniculate-branched, lower branches alternate, upper branches verticillate. Basal leaves broadly ovate in outline, ternate-3-pinnatisect; ultimate segments gray-green, lanceolate, ca. 10 mm, thin-leathery, soon wilting, distally crenulate to slightly lobed, densely pubescent, base cuneate, deciduous. Cauline leaves often less divided than basal, uppermost reduced to bladeless sheaths. Terminal umbels sessile, lateral umbels 2–3, smaller, verticillate with elongate peduncles exceeding terminal; umbels ca. 12 cm across; bracts absent; rays 15–23, subequal, sparsely pubescent; bracteoles lanceolate, deciduous; umbellules 12–20-flowered. Petals abaxially puberulous. Fruit ellipsoid, ca. 10–12 mm; vittae 1–2 in each furrow, 6 on commissure. Fl. and fr. Apr–Jun.

Desert gravels; ca. 600–800 m. NW Xinjiang (Toli) [Russia (W Siberia); C Asia].

This species has reputed medicinal value.


荒地阿魏 huang di a wei

Plants 15–30 cm, not onion-scented. Stem slender, slightly flexuose, densely hirsute, corymbose-branched, branches alternate. Basal leaves sub sessile or sessile; leaf blade rhombic, 2–3-pinnatisect, ultimate segments gray-green, elliptic, ca. 2 cm, densely pubescent on both surfaces, 3–5-lobed, lobules tri-
angular, deciduous. Uppermost leaves often bladeless, petioles sheathing throughout. Compound umbels terminal on stem and branches; umbels 4–6 cm across; rays 6–12, subequal; bracteoles lanceolate, densely white pubescent, persistent; umbelules 1–25-flowered. Petals abaxially puberulous. Stylodium low-conic, base dilated, undulate-margined. Fruit ellipsoid, 5–8 × ca. 3 mm; lateral ribs narrowly winged, wings grayish white; vittae large, 1 in each furrow, 2 on commissure. Fl. and fr. May–Jun.

Valley sides, gravelly slopes, sandy places in cultivated land; 500–1000 m. N Xinjiang [Kyrgyzstan, Uzbekistan].


河西阿魏

Plants ca. 50 cm, roughened and hispid throughout, not onion-scented. Stem slender, solitary, paniculate-branched, lower branches alternate, upper branches verticillate. Leaf blades broadly ovate, ternate-3–4-pinnatisect; ultimate segments ca. 5 mm, margins triangular-toothed or lobed, apex acute, mucronate. Upper leaves often bladeless, petioles wholly sheathing. Terminal umbel long-pedunculate, lateral umbels few, shorter than terminal; umbels 5–10 cm across; bracts few, linear, persistent; rays 10–18, subequal; bracteoles several, subulate or narrow-lanceolate, glabrous; umbellules 10–15-flowered. Petals abaxially sparsely pubescent. Stylodium low-conic, base dilated. Fruit broadly ellipsoid or obovoid, 8–10 × 4–7 mm, sparsely pubescent; lateral wings broad; vittae 1 in each furrow, 2–6 on commissure, unequal. Fl. Jun., fr. Jul.

● Moist places on mountain slopes. N Gansu (Sunan).


灰色阿魏


Plants 30–40 cm. Stem slender, slightly flexuose, corymbose-branched, lower branches alternate, upper branches opposite. Leaves triangular-ovate in outline, 3-pinnate/pinnatisect; ultimate segments gray-green, oblange-lanceolate or ovate, 5–10 mm, densely pubescent on both surfaces, deciduous. Cauline leaves few, less divided than basal, uppermost often bladeless, petioles wholly sheathing, sheaths oblange-lanceolate, pubescent. Terminal umbel pedunculate, lateral umbels 1–2, exceeding terminal; umbels 3–6 cm across; bracts absent; rays 2–4–5(–8), subequal; bracteoles few, lanceolate, scarious-margined; umbellules ca. 10-flowered. Petals glabrous. Stylodium low-conic, base dilated, lobed. Fruit oblong-ellipsoid, 8–14 × 3.5–6 mm; vittae 1 in each furrow, large, 2 on commissure. Fl. Jun., fr. Jul.

Desert gravels; ca. 800 m. N Xinjiang (Fuyun) [Kyrgyzstan, Russia (W Siberia), Uzbekistan].


大果阿魏

Plants 40–50 cm, polycarpic, strongly onion-scented. Cauline leaves reduced upwards to small, broad, leathery ovate-lanceolate sheaths. Terminal umbel sessile or short-pedunculate, lateral umbels 1–2, exceeding terminal; umbellules 6–10-flowered. Petals abaxially puberulent, persistent for a long time after flower. Fruit long-ellipsoid, 12–14 × 6–7 mm; vittae 3–4 in each furrow, 10–12 on commissure, very unequal. Fl. and fr. May–Jun.

Sandy places on low mountain slopes; 1000–1100 m. N Gansu (Manas) [Afghanistan, Kazakhstan, Kyrgyzstan, W Pakistan, Uzbekistan; C Asia, SW Asia (Iran)].

The rootstock is used medicinally.


硬阿魏

Peucedanum rigidum Bunge.

Plants 30–60 cm. Stems slender, 2–3 × corymbose-branched, lower branches alternate, upper branches opposite or verticillate. Basal leaves rosetted; blade broadly ovate or triangular, 2–3-pinnatisect; ultimate segments glaucous-blue, long-elliptic or ovate, 1–3 × 1–2 mm, pinnatifid, lobules cune ate-ovobovate, apex 3-triangular-toothed, sub-leathery, rigid, densely pubescent, base cuneate, apex mucronate. Cauline leaves few, uppermost leaves bladeless, petioles wholly sheathing. Umbels 4–12(–25) cm across; bracts absent or 1–2, subulate; rays 4–15, unequal, spreading; bracteoles 3–5, linear-lanceolate, unequal; umbellules 5–12-flowered. Stylodium low-conic, base dilated. Fruit broadly ellipsoid, 10–15 × 4–6 mm; lateral ribs narrowly winged; vittae 1 in each furrow, 2 on commissure. Fl. and fr. May–Jul.

● Gravelly slopes, sandy places; 200–2500 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shanxi.

This species has reputed medicinal value.


羊背阿魏


Plants 50–100 cm. Stems slender, 1–2, rigid, often purplish red, nodes slightly swollen, paniculate-branched, lower branches alternate, upper branches verticillate. Leaf blade ovate, ternate-3–4-pinnatisect; ultimate segments ovate, 5–10 mm, densely hispid, sub-leathery, margins toothed or lobed. Cauline leaves reduced upwards to small, broad, leathery ovate-lanceolate sheaths. Terminal umbel sessile or short-pedunculate, lateral umbels 1–2(–5), exceeding terminal; umbels 4–6 cm across; bracts absent; rays 3–10; bracteoles squamose, deciduous; umbellules 5–12-flowered. Stylodium low-conic, base dilated. Fruit ellipsoid, 5–10 × 2–5 mm; lateral ribs narrowly winged;
vittae 1 in each furrow, 4–8 on commissure, large. Fl. and fr. May–Jul.

Gravelly slopes; 1200–1700 m. N Xinjiang (Altay, Tacheng) [Afghanistan, Kazakhstan, Kyrgyzstan, W Pakistan, Tajikistan; SW Asia (Iran)].


多石阿魏 duo shi a wei

Plants 60–100 cm, hispid throughout. Stems slender, several, nodes slightly swollen, paniculate-branched, lower branches alternate, upper branches verticillate. Basal leaves short-petiolate, sheaths dilated; blade broadly rhombic, 3-pinnatisect, sub-leathery; ultimate segments broadly elliptic, 2–3(–4) × 1–2 cm, base cuneate, distally lobed, lobules entire or toothed, base decurrent. Upper leaves bladeless, petioles wholly sheathing, sheaths enlarged, elliptic-lanceolate, rigid and clasping. Terminal umbel sessile or short-pedunculate, lateral umbels 1–3, opposite or verticillate with elongate peduncles, exceeding terminal; umbels 3–6 cm across; bracts and bracteoles lanceolate, deciduous; rays 6–16, subequal; umbellules 10–15-flowered. Stylopodium low-conic; styles elongate. Fruit ellipsoid, ca. 10 mm; vittae 1 in each furrow, 2 on commissure. Fl. Jun, fr. Jul.

Grassy places on gravelly slopes; ca. 1200 m. W Xinjiang (Qapqal) [Kyrgyzstanz].


全裂叶阿魏 quan lie ye a wei


Plants 40–100 cm. Stem slender, often purplish red, nodes swollen, paniculate-branched, branches usually verticillate. Basal leaves short-petiolate, sheaths dilated; blade broadly ovate, 3–4(–5)-pinnatisect; ultimate segments grey-green, linear, 1–2 mm, densely hispid, sub-leathery. Cauline leaves reduced upwards, sheaths lanceolate or ovate, embracing, becoming rigid when old. Terminal umbel sessile or pedunculate, lateral umbels 1–5, long-pedunculate, exceeding terminal; umbels 4–8 cm across; bracts absent; rays 4–14, subequal; bracteoles small, lanceolate, deciduous; umbellules 8–15-flowered. Stylopodium low-conic, base dilated; styles elongate. Fruit ellipsoid, 7–11 × 3–5 mm; vittae 1 in each furrow, 6 on commissure. Fl. May, fr. Jun.

Gravelly slopes; 1000–1700 m. N Xinjiang (Altay, Tacheng) [Kazakhstan, Russia (W Siberia)].


麝香阿魏 she xiang a wei


Plants 0.5–1 m, pubescent becoming subglabrous. Stem slender, corymbose-branched, lower branches alternate, upper branches verticillate. Leaf blade broadly elliptic-triangular, ternate-2-pinnatisect; ultimate segments oblong or lanceolate, 20–35 × 10–15 mm, remote, rather thick, adaxially glabrous, abaxially pubescent, sometimes sparsely papillate along veins, distally lobed, lobules entire or toothed. Terminal umbel long-pedunculate, lateral umbels 1–2, solitary or opposite, slightly exceeding terminal; umbels 4–6 cm across; bracts absent; rays 6–12, subequal; bracteoles lanceolate; umbellules 9–12-flowered. Stylopodium low-conic, base dilated, margins undulate. Fruit ellipsoid, ca. 7 mm; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Jul.

Scrub on gravelly slopes; 1500–1600 m. W Xinjiang (Zhao-su) [Kyrgyzstanz, Tajikistan].


山蛇床阿魏 shan she chuang a wei

Plants 2–3 m. Stem slender, purplish red-tinted, 2 × corymbose-branched, lower branches alternate, upper branches verticillate, branchlets often opposite, rarely alternate or single. Basal leaves long-petiolate, articulate between petiole and blade; blade triangular-ovate, 3-ternate, leaflets 2-pinnatisect; ultimate segments broadly elliptic or long-elliptic, 10–30 × 5–20 mm, abaxially pubescent, pinnate, lobules entire or toothed. Upper leaf bladeless, sheaths lanceolate. Umbels 4–8 cm across, terminal on stem, branches and branchlets; bracts absent; rays 6–12, subequal; bracteoles several, lanceolate or subulate, persistent; umbellules 12–17-flowered. Stylopodium low-conic, base dilated. Fruit ellipsoid, ca. 7 × 3 mm; vittae small, 1 in each furrow, 2 on commissure. Fl. Jun, fr. Jul.

Scrub or grassy places on gravelly slopes; ca. 1500 m. Xinjiang (Tian Shan) [C Asia (W Tian Shan)].


榄绿阿魏 lan li a wei


Plants 30–60 cm, glabrous throughout, glaucous. Stem solitary, corymbose-branched, branches alternate, remote. Basal leaves short-petiolate; blade broadly ovate, 2–3-pinnatisect; ultimate segments broadly elliptic or ovate, pinnatifid, lobules elliptic or obovate, rather thick, veins elevated abaxially, base cuneate, decurrent, margin toothed, apex mucronate. Umbels terminal on stem and branches, ca. 12 cm across; bracts absent or few, linear, unequal, occasionally foliaceous, deciduous; rays 8–16, unequal; bracteoles linear, persistent; umbellules 10–20-flowered; pedicels unequal, 5–10 mm. Petals yellowish green. Stylopodium low-conic, base thickened. Fruit oblong or ellipsoid, ca. 10 × 5 mm; vittae 1 in each furrow, 6 on commissure. Fl. and fr. May–Jul.●

Forests, grassy slopes, rock crevices on valley sides; 3300–3800 m. NW Yunnan (Lijiang).

This species has reputed medicinal value.


草甸阿魏 cao dian a wei

This is a species of medicinal value.
Ferula gracilis (H. Wolff) Korovin.

Plants 0.5–1 m, glabrous throughout, glaucous. Stem fluted. Leaf blade broadly triangular-ovate, 3-pinnate, pinnae 4–5 pairs; ultimate segments oblong-ovate or broadly ovate, 1.5–2.5 × 1–1.8 cm, subleathery, abaxially glaucous, base cuneate or truncate, irregularly coarsely toothed. Upper leaves 3-lobed, lobules ovate-lanceolate, sheaths dilated, suborbicular. Umbels 8–15 cm across; bracts 1–2, broadly ovate or ovate-lanceolate, unequal; rays 7–16, stout, 4–7 cm; bracteoles 6–8, linear-lanceolate, shorter than flowers; umbellules 12–20-flowered. Calyx teeth obsolete or subulate. Stylopodium low-conic. Fruit lanceolate, shorter than flowers; umbellules 12–20-flowered. Stylodium low-conic, base dilated; styles elongate. Fruit ellipsoid, ca. 8 mm; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Jun–Jul.


Plants 1–1.5 m. Stem slender, paniculate-branched, lower branches alternate, upper branches verticillate. Basal leaves long-petiolate; blade broadly rhombic, ternate-3-pinnatisect; ultimate segments oblong or ovate-oblong, 8–15(–30) × 3–5 (–10) mm, usually pinnatisect, lobules linear, entire, adaxially glabrous, abaxially sparingly hispid. Upper leaves bladeless, sheaths lanceolate. Terminal umbel sessile or short-pedunculate, lateral umbels 2–4, opposite or verticillate, rarely single, exceeding terminal; umbels 5–10 cm across; bracts lanceolate; rays 10–20(–25), subequal, very spreading; bracteoles 5–7, lanceolate, shorter than flowers; umbellules 12–20-flowered. Calyx teeth obsolete or subulate. Stylopodium low-conic. Fruit ellipsoid, 0.8–1 × ca. 0.5 cm; lateral ribs narrowly winged; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Aug–Oct.

19. Ferula akitschkensis

Mountain slopes, scrub or grassy places on gravelly slopes; 900–2100 m. N Xinjiang (Altay, Bole, Tacheng) [Kazakhstan, Kyrgyzstan, Russia].

20. Ferula songarica

Plants 0.5–1 m, glabrous throughout, glaucous. Stem slender, erect, paniculate-branched from middle, branches alternate. Basal leaves short-petiolate; blade broadly ovate, ternate–2–3–pinnatisect; ultimate segments ovate or oblong-elliptic, pinnatifid, lobules lanceolate, ca. 5–10 mm, adaxially glabrous, abaxially sparingly pubescent, thin-papery. Cauline leaves reduced upwards, uppermost leaves bladeless, sheaths lanceolate, deciduous. Terminal umbel pedunculate or subsessile, lateral umbels 1–2, pedunculate, usually slightly shorter than terminal; bracts absent; rays 4–8, unequal; bracteoles lanceolate, membranous, deciduous; umbellules 10–15-flowered. Stylodium low-conic, base dilated; styles elongate. Fruit ellipsoid, 5–7 mm; vittae in each furrow, 2 on commissure. Fl. Jun, fr. Jul.

21. Ferula gracilis

Plants 50–80 cm, sparsely pubescent. Stem slender, erect, solitary, paniculate-branched from middle, branches alternate. Basal leaves short-petiolate; blade broadly ovate, ternate–2–3–pinnatisect; ultimate segments ovate or oblong-elliptic, pinnatifid, lobules lanceolate, ca. 5–10 mm, adaxially glabrous, abaxially sparingly pubescent, thin-papery. Cauline leaves reduced upwards, uppermost leaves bladeless, sheaths lanceolate, deciduous. Terminal umbel pedunculate or subsessile, lateral umbels 1–2, pedunculate, usually slightly shorter than terminal; bracts absent; rays 4–8, unequal; bracteoles lanceolate, membranous, deciduous; umbellules 10–15-flowered. Stylodium low-conic, base dilated; styles elongate. Fruit ellipsoid, 5–7 mm; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Jun–Jul.

22. Ferula songarica
Plants 60–120 cm. Rays 3–7, 1.5–3 cm. Fruit 7–10 mm; vittae 1–3 in each furrow, 4–6 on commissure.

- Mountain slopes; 100–200 m. EC Anhui (Dingyuan), NW Jiangsu (Suning, Tongshan), W Shanxi (Jinan).


短柄阿魏  duan bing a wei


Plants 0.5–1 m. Root cylindrical, with spherical tuberous swellings. Stem corymbose-branched above, branches alternate. Basal leaves sessile or short-petiolate with expanded sheaths; blade triangular-ovate, ternate-2–3-pinnatisect; ultimate segments broadly elliptic, usually pinnately parted, lobules lanceolate, ca. 5 mm, roughened, both surfaces sparsely hispid, apex mucronate. Terminal umbel pedunculate or sessile, lateral umbels 2–3, opposite or verticillate, rarely single, long-pediculate, exceeding terminal; bracts subulate, deciduous; rays 4–10, unequal; bracteoles subulate, deciduous; umbellules 4–15-flowered. Stylodium low-conic, base dilated, deciduous. Fruit ellipsoid, ca. 8 mm; vittae 1 in each furrow, large, 2 on commissure. Fl. and fr. May–Jul.

Gravelly slopes; 1100–1700 m. W Xinjiang (Xinjiang) [C Asia (Altay, Pamir, Tian Shan)].

24. **Ferula feruloides** (Steudel) Korovin, Monogr. Ferula, 77. 1947 [*"ferulaeoides"*].

多伞阿魏 duo san a wei


Plants 1–1.5 m. Root fusiform. Stem stout, solitary, rarely 2–4, sparingly pubescent, paniculate-branched from middle, branches verticillate, occasionally alternate. Basal leaf blade broadly ovate, ternate-4-pinnate/pinnatifid; ultimate segments ovate, ca. 10 mm, usually parted, lobules entire or toothed, densely pubescent, deciduous. Inflorescence copiously cymose-branched, often several simple umbels successively verticillate on the same branch, forming a crowded moniliform raceme; umbels ca. 2 cm across; bracts absent; rays 4, subequal; bracteoles small, deciduous; umbellules ca. 10-flowered. Stylodium depressed-conic. Fruit ellipsoid, 3–7 × 1.5–3 mm; vittae 1 in each furrow, 2 on commissure. Fl. May, fr. Jun.

Desert gravels; 400–1100 m. N Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia (Siberia), Uzbekistan].


球根阿魏属 qiu gen a wei shu

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs, perennial. Taproot long, deeply rooted, irregularly thickened, usually with 1 to several globose tubers. Stem solitary, erect, base densely clothed in fibrous remnant sheaths. Leaves bluish green with prominent white veins, petiolate; blade 3–4-ternately dissected; ultimate segments linear, plane or falcate. Umbels compound, terminal on stem and branches; bracts absent; umbellules many-flowered, capitulate; bracteoles several; lanceolate or ovate lanceolate, entire; pedicels obsolete. Calyx teeth subulate or lanceolate when young, becoming dilated. Petals yellowish, obovate, apex incurved, abaxially pubescent, paler, margins green or purplish-red. Stylodium low-conic, base dilated, undulate; styles elongate, recurved. Fruit ellipsoid, strongly dorsally compressed, densely

In C Asia the leaves are harvested for cattle fodder, and the plants have reputed medicinal value, presumably as a regional substitute for the traditional Chinese medicine “a wei” (*Ferula assafoetida* Linnaeus).


里海阿魏 li hai a wei


Plants 30–60 cm. Root fusiform; caudex branched. Stem single, rarely 2–3, slender, 2 × paniculate-branched, branches alternate, branchlets opposite or alternate. Basal leaves short-petiolate; blade broadly ovate, 3-pinnate/pinnatifid; ultimate segments ovate, usually lobed, lobules lanceolate, both surfaces roughened, hispid, apex acute, deciduous. Compound umbels terminal, simple umbels lateral on branches and branchlets, 1–3, opposite or verticillate, umbels 1.5–3 cm across; bracts and bracteoles absent; rays 1–6, subequal; umbellules 8–10(–15)-flowered. Stylodium low-conic, base dilated; styles elongate. Fruit ellipsoid, ca. 4–5(–9) × 3–4(–7) mm; lateral ribs narrowly winged; vittae 1 in each furrow, 2 on commissure. Fl. and fr. May–Jul.

Rock crevices on low mountain slopes; 500–1800 m. N Xinjiang [Kyrgyzstan, W Mongolia, Russia (Siberia), Uzbekistan; C and SW Asia].


沙生阿魏 sha sheng a wei

*Ferula dshaudshamyr* Korovin.

Plants 50–70 cm. Stem solitary, 2 × paniculate-branched. Leaf blade broadly elliptic, 3-pinnate/pinnatifid; ultimate segments elliptic, 5–10 mm, usually lobed or toothed, adaxially glabrous, abaxially densely pubescent. Compound umbels terminal on stem and branches, simple umbels lateral on branches and branchlets, 1–2, solitary or opposite; umbels 1–4 cm across; bracts and bracteoles absent; rays 2–7, subequal; umbellules 6–10-flowered. Stylodium low-conic, base dilated, margins undulate; styles elongate. Fruit ellipsoid, 4–6 × 2–4 mm; lateral ribs narrowly winged, wings whitish; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Jun–Jul.

Sandy slopes in deserts; 400–600 m. N Xinjiang (Altay) [Kazakhstan, Kyrgyzstan, W Mongolia; C Asia].
pubescent; dorsal ribs obscure, lateral ribs broad-winged; vittae 3–5 in each furrow, 10–12 on commissure. Seed face plane. Carpophore 2-cleft near base.

One species: China, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan; SW Asia (Iran).


球根阿魏 qiú gēn ā wèi


Plants 40–100 cm. Stem slender, glabrous, lower branches alternate, upper branches verticillate. Leaf blade obtriangular or broadly ovate, 8–40 × 6–30 cm; ultimate leaf segments 2–20 × 0.5–1 mm, entire or serrate apically. Umbels 3–12 cm across; rays 5–29, subequal, glabrous, white-striate; bracteoles 5–6, pubescent, margins scarious; umbellules very small, 4–7 mm across, remote. Calyx teeth broadly triangular, white membranous in fruit. Fruit 10–15 × 5–8 mm.; Fl. and fr. May–Jul.

Sandy places in deserts; 500–700 m. N Xinjiang (Altay Shan, Huocheng, Tian Shan) [Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan; SW Asia (Iran)].


球根阿魏 qiú gēn ā wèi


Plants 40–100 cm. Stem slender, glabrous, lower branches alternate, upper branches verticillate. Leaf blade obtriangular or broadly ovate, 8–40 × 6–30 cm; ultimate leaf segments 2–20 × 0.5–1 mm, entire or serrate apically. Umbels 3–12 cm across; rays 5–29, subequal, glabrous, white-striate; bracteoles 5–6, pubescent, margins scarious; umbellules very small, 4–7 mm across, remote. Calyx teeth broadly triangular, white membranous in fruit. Fruit 10–15 × 5–8 mm.; Fl. and fr. May–Jul.

Sandy places in deserts; 500–700 m. N Xinjiang (Altay Shan, Huocheng, Tian Shan) [Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan; SW Asia (Iran)].
1a. Calyx teeth obsolete or inconspicuous.

2a. Plants several or numerous, persistent.
3a. Plants small, 5–20 cm, acaulescent; peduncles numerous; scapiform.
4a. Leaf blade 2–3-pinnate; bracteoles entire fruit hispid (Xizang) ................................................................. 2. *P. nanum*

4b. Leaf blade 3–4-pinnatisect; bracteoles pinnate; fruit glabrous (Yunnan) .................................................. 3. *P. acaule*

3b. Plants tall, more than 20 cm, acaulescent.
5a. Plants 50–100 cm; leaf blade 3–pinnately dissected, 3-lobed or 2-ternate.
6a. Ultimate segments of leaves linear, entire; fruit vittae 1 in each furrow, 2 on commissure (Heilongjiang, Jilin) .............................................................. 1. *P. elegans*

6b. Ultimate segments of leaves ovate or ovate-rhombic; fruit vittae 1–2 in each furrow, 2–4 on commissure (Guangxi, Jiangxi) ................................................................. 11. *P. longshengense*

5b. Plants 20–50 cm; leaf blade 1–2-pinnate.
7a. Bracteoles pinnate; fruit vittae (1–)2–3 in each furrow, 4–6 on the commissure (Yunnan) .................................. 4. *P. delavayi*

7b. Bracteoles entire; fruit vittae 1(–2) in each furrow, 2 on the commissure (Sichuan).
8a. Bracts large, 3-lobed or pinnate; fruit glabrous (N Sichuan) ................................................................. 12. *P. songpanense*

8b. Bracts small, undivided; fruit pubescent (W Sichuan) ................................................................. 32. *P. torilifolium*

2b. Bracts usually absent or few bracts and falling early.
9a. Stem stout, hollow.

10a. High altitude (above 2500 m) plants, leaves green; fruit ca. 8 × 6 mm, glabrous; vittae large, 1 in each furrow, 2 on commissure (SW China) ................................................................. 5. P. angelicoides

10b. Coastal plants, leaves glaucous; fruit to 6 × 4 mm, pubescent; vittae small, 3–5 in each furrow, 6–10 on commissure (E, S, and SE China) ................................................................. 13. P. japonicum

9b. Stem stout or slender, solid.

11a. Ultimate segments of leaves narrow, linear, less than 0.5 mm wide.

12a. Synflorescence many-branched, corymbose; fruit vitellae 1 in each furrow, 2 on the commissure (NE China) .................................................................................................................... 6. P. stepposum

12b. Synflorescence little-branched; fruit vitellae 2–3 in each furrow, 6 on the commissure.

13a. Rays 3–6; lateral wings of fruit very narrow (Sichuan) ................................................................. 33. P. veitchii

13b. Rays 10–15; lateral wings of fruit broad (Nei Mongol) ................................................................. 34. P. pricei

11b. Ultimate segments of leaves variously shaped, more than 4 mm wide.

14a. Leaf blade 3–4-pinnate; petiole 15–33 cm.

15a. Bracteoles 8–12, ovate-lanceolate (Chongqing) ........................................................................ 8. P. wulongense

15b. Bracteoles less than 7, linear or subulate.

16a. Rays 12–16; umbellules 10–20-flowered (Chongqing, Hubei) .................................................... 7. P. dielsianum

16b. Rays 5–7; umbellules 5–10-flowered (SW China) ...................................................................... 35. P. chinense

14b. Leaf blade 1–2-ternate or 2–3-pinnate; petioles 3–15 cm.

17a. Leaf blade narrowly ovate; ultimate segments narrow, linear, oblanceolate or obovate, 1–2.5 × 0.5–1 cm (Gansu, Sichuan) ................................................................. 9. P. targentifolium

17b. Leaf blade triangular-ovate or broadly triangular; ultimate segments usually large, rhombic-ovobate or long-ovate, 1.5–7 × 1.2–5 cm.

18a. Leaflets sharply serrate with setaceous teeth; bracteoles longer than flowers; fruit densely hispid (S and SE China) ........................................................................................................ 10. P. formosanum

18b. Leaflets coarsely toothed or crenate-dentate; bracteoles shorter than flowers; fruit sparsely puberulent (widespread in China) ................................................................. 14. P. praeruptorum

1b. Calyx teeth conspicuous.

19a. Lateral wings of fruit very narrow, less than 1/3 width of the body, thick.

20a. Leaf blade 1– to several-pinnate or pinnately dissected.

21a. Leaf dissection diffuse; ultimate segments of basal leaves linear elongate, usually 3–10 × 0.1–0.3 cm; flowers pale yellow (Xinjiang) .............................................................................. 31. P. morisonii

21b. Leaf dissection compact; ultimate segments of basal leaves much shorter and broader; flowers white.

22a. Stems many, often diffuse-caespitose; fruit vitellae 1–2 in each furrow, 2 on commissure (N China)

22b. Stems several or solitary, not diffuse-caespitose; fruit vitellae (1–)2–4 in each furrow (2–)4–6 on commissure (SW China).

23a. Leaf sheath auriculate at apex; bracts 2–3, unequal, occasionally pinnate; rays 12–20; bracteoles 6–8, linear, undivided or 3-incised to pinnate (Sichuan, Yunnan) ........................................ 19. P. macilentum

23b. Leaf sheath not auriculate at apex; bracts 6–10, linear, equal; rays 24–40; bracteoles 10, linear or linear-lanceolate (Sichuan, Yunnan) .......................................................... 20. P. rubricaule

20b. Leaf blade ternate-1–2-pinnate or 2–3-ternate.

24a. Basal leaves densely pubescent on both surfaces; rays 10–15, densely tomentose or hispid all round (Sichuan, Yunnan) ........................................................................................................ 18. P. pubescens

24b. Basal leaves glabrous sparsely pubescent; rays 5–8 or 15–34, inner faces pubescent or glabrous, outer faces glabrous.

25a. Umbels small, 1–4 cm across; rays less than 2 cm (Anhui, Jiangsu, Shandong) ....................... 16. P. wawrae

25b. Umbels large, 8–15 cm across; rays more than 5 cm.

26a. Rays 15–34; bracteoles 10–16 (Shaanxi) ................................................................................... 15. P. ampliatum

26b. Rays 5–6; bracteoles absent (Hubei) ....................................................................................... 36. P. henryi

19b. Lateral wings of fruit rather broad, thin, ca. 1/3 as wide as body.


28a. Bracteoles pinnate (NE China) ................................................................................................. 37. P. piliferum

28b. Bracteoles linear, entire (Henan, Shaanxi) .............................................................................. 38. P. ledebourielloides

27b. Bracts absent, occasionally few but falling early.

29a. Leaf blade 2–3-ternate, rarely 2-pinnate; primary umbels large, 7–15 cm across (C and S China) 30. P. medicum

29b. Leaf blade 1- to several-pinnate or pinnately dissected; primary umbels smaller, usually less than 7 cm across.

30a. Rays roughened or pubescent on all sides, or glabrous.

31a. Whole plant glabrous; ultimate segments of leaves elongate-linear (Xinjiang) ......................... 24. P. falcaria
31b. Plant puberulent, at least around nodes and rays; ultimate segments of leaves not elongate-linear.

32a. Stem solid, with pith (Guangxi) ........................................................................................................ 28. P. mashanense

32b. Stem hollow.

33a. Fruit vittae 3–4 in each furrow, 8 on commissure (Xizang) .............................................................. 27. P. violaceum

33b. Fruit vittae 1 in each furrow, 2 on commissure (Yunnan) ................................................................. 39. P. yunnanense

30b. Inner faces of rays strigose or pubescent, outer faces glabrous.

34a. Leaf blade 2–3-pinnately dissected; ultimate segments small, linear and entire (N and NE China) ... 23. P. baicalense

34b. Leaf blade 1–4-pinnate or pinnately dissected; ultimate segments large, ovate, rhombic, obovate or ovate-lanceolate.

35a. Fruit vittae 1 in each furrow, 2–4 on commissure.

36a. Plants large, 30–120 cm; stem solid, with pith; leaf blade 2–3-pinnate/pinnatifid (N and NE China) ................................................................................................................................. 21. P. terebinthaceum

36b. Plant small, 20–30 cm; stem hollow; leaf blade pinnate (Yunnan) ......................................................... 22. P. franchetii

35b. Fruit vittae 1–4 in each furrow, 4–10 on commissure.

37a. Fruit large, 6–8 × 3.5–4.2 mm, glabrous (Chongqing, Guizhou, Sichuan) ......................................... 25. P. dissolutum

37b. Fruit smaller 4–5 × 3–4 mm, pubescent.

38a. Leaf blade broadly triangular-ovate, 3-pinnate/pinnatifid, pubescent (sometimes sparsely), papery (N, NE, and NW China) ........................................................................................................... 26. P. harry-smithii

38b. Leaf blade ovate-oblong, 2-pinnate, glabrous, thinly coriaceous (Guangxi) ......................................... 29. P. guanxiense


Mountain slopes, grasslands, rock crevices; 2600–3400 m. NW Yunnan (Eryuan, Lijiang).

This poorly known species is recorded only from a few collections. Its taxonomic placement is not fully resolved, and some authors consider it to be synonymous with *Sinodielsia yunnanensis* (*Meeboldia yunnanensis* in the present account).


**zhì yè qián hu**

Plants stout, to 1 m. Stem hollow, fluted above especially around nodes. Petoles pubescent, broadly sheathing; leaf blade broadly triangular-ovate, 2–3-ternate, ultimate segments large, hispid on rachises and veins, especially abaxially, base cuneate, irregularly doubly serrate, terminal segments elliptic, 3–6 × 2–4 cm, lateral segments often oblique-ovate, 1.5–3.5 × 1–2.5 cm. Leaves reducing upwards. Umbels 8–12 cm across; peduncles stout; bracts absent or 1, ovate-lanceolate; rays 10–15, 1.5–5 cm, unequal, tomentose; bracteoles several, linear-lanceolate, longer than flowers; umbellules 10–18-flowered. Calyx teeth obsolete. Petals white. Fruit long-ellipsoid, 3–5 × 2.5–3 mm, glabrous; lateral ribs broadly winged, wings rather thick; vittae 1–2 in each furrow, 4–6 on commissure. Fl. Jul–Aug, fr. Sep–Oct.

- Moist rocky slopes; 600–1500 m. Chongqing, SW Hubei.

The root is used in Chongqing as a regional substitute, known as "zhù jìe fāng fēng," for the traditional Chinese medicine "fang fēng" (see *Saposhnikovia divaricata*).


**wù lóng qián hu**

Plants to 1 m, essentially glabrous. Stem solitary, much branched above, branches long and slender. Basal leaf blade broadly triangular-ovate, 3–4-pinnate, pinnae 3–4 pairs; petiole long, 17–33 cm; ultimate segments oblong-ovate, 1.5–4.5 × 0.4–1.4 cm, base cuneate, 1–2-lobed or toothed towards apex, apex apiculate. Stem leaves reduced upwards, petioles short or wholly sheathing, segments linear or oblanceolate, 10–20 × 3–5 mm. Umbels 1–8 cm across; bracts absent or 2–3, linear, 5–7 × 0.5 cm; rays 8–13, unequal, 4-ridged, sparsely pubescent; bracteoles 8–12, ovate-lanceolate, as long as or slightly longer than flowers. Calyx teeth obsolete. Petals white. Styles short. Fruit oblance-ellipsoid, 3–4 × 2.5–3 mm, glabrous; lateral ribs winged, wings thick; vittae 2–3 in each furrow, 4 on commissure. Fl. and fr. Aug–Oct.

- Riversides, stony slopes; ca. 600 m. Chongqing.


**cháng qián hu**

**Peucedanum pulchrum** H. Wolff. Plants 40–70 cm. Stem solitary, often purplish, erect, puberulent. Basal leaf blade broadly ovate in outline, 3–4-lobate, pinnate 3–4 pairs; petiole 8–15 cm; ultimate segments obovate or oblanceolate, 1.5–2.5 × 0.5–1.5 cm, abaxially more or less glaucous and hispidulous, base cuneate, 2–4-irregularly-toothed or lobed, margin ciliate. Synflorescence little-branched; peduncles hispidulous; umbels 2–10 cm across; bracts absent; rays 5–12 cm, 0.3–4 cm, very unequal, pubescent; bracteoles 8–12, linear or lanceolate, longer than flowers, densely pubescent; umbellules 10–20-flowered. Calyx teeth obsolete. Petals white, suborbicular, abaxially puberulent. Styles short. Fruit ovate-ellipsoid, 3–5 × 2.5–3 mm, sparsely puberulous; lateral ribs narrowly winged; vittae 3–4 in each furrow, 6–8(–10) on commissure. Fl. and fr. Jul–Oct. *n* = 11.

- Scrub, valley sides, open grasslands; 2000–3600 m. S Gansu (Jone, Téwo), N Sichuan.
This species has reputed medicinal value.


*Peucedanum terebinthaceum* (Fischer ex Treviranus) Ledebour subsp. *formosanum* (Hayata) Kitagawa.

Plant robust, 1–3 m. Stem tomentose in upper parts. Leaf blade broadly triangular, ternate or ternate-pinnate; ultimate segments ovate or long-ovate, irregularly parted or lobed, sharply serrate with setaceous teeth, base cuneate or truncate. Umbels 3–8 cm across; peduncles stout, tomentose; bracts few or absent, linear to lanceolate, 10–15 × 1–2 mm; rays 10–18, 2–4 cm, unequal, densely tomentose; bracteoles 10–12, ovate-lanceolate, caudate or 3-lobed, mostly longer than flowers, abaxially tomentose, margins white-ciliate; umbellules 15–25-flowered. Calyx teeth obsolete or inconspicuous. Petals white. Style short. Fruit oblong-ovate or suborbicular, 3–4 × 2–2.5 mm, erosed. Calyx teeth obsolete or inconspicuous. Petals white. Style short. Umbel 10–20-flowered. Pedicels 3–12 mm, unequal. Calyx teeth absent. Petals white, obovate unequal. Styles short. Fruit oblong, 5–7 × 4–5 mm; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Sep–Oct.

- Sparse *Betula* forests, margins of cultivated areas; 2800–3000 m. N Sichuan (Songpan).


**APIACEAE**

186


ments linear, 3–10 × 1–1.6 mm, both surfaces glabrous, apex mucronate. Umbels 5–10 cm across; bracts 6–10, linear, 10–15 × ca. 0.5 mm, puberulous; rays numerous, 24–40, subequal, 3–5 cm; bracteoles ca. 10, linear-lanceolate; umbelules ca. 20-flowered. Calyx teeth conspicuous, triangular, acute. Fruit ellipsoid, 4–6 × 3–4 mm, glabrous; dorsal ribs slightly prominent, lateral ribs narrowly winged, wings rather thick; vittae 1–2(–3) in each furrow, 4–6 on commissure. Fl. Jul–Aug, fr. Sep–Oct.

- Scrub, grassy slopes, rock crevices; 2000–3000 m. S Sichuan, NW Yunnan.


石防风  shi fang feng

Plants 30–120 cm. Stem puberulous above. Basal leaf blade elliptic or triangular-ovate, 2-pinnate/pinnatisect; pinnae 3–5-paired; ultimate segments lanceolate, 0.8–3 × 0.5–1.2 cm, both surfaces glabrous, sometimes pubescent near basal veins, base cuneate, margins lobed or 2–3-toothed. Synflorescence much branched, apex of peduncles hispid; umbels 3–10(–15) cm across; bracts absent or 1–2, linear-lanceolate; rays 8–20(or more), unequal, 4-angled, inner faces hispid, outer faces glabrous; bracteoles 6–10, linear, shorter than flowers. Calyx teeth long-subulate. Petals white, midvein pale yellow. Styles longer than stamens. Fruit ellipsoid or ovoid-ellipsoid, 3.5–4 × 2.5–3.5 mm, glabrous; dorsal ribs prominent, lateral ribs winged, wings ca. 1 mm, ca. 1/3 width of body, thin; vittae 1 in each furrow, 2 on commissure. Fl. Jul–Sep, fr. Sep–Oct.

Mixed forests, forest margins, scrub, grassy slopes; 200–1200 m. NE Hebei, Heilongjiang, S Jilin, Liaoning, E Nei Mongol (Da Hinggan Ling) [Japan, Korea, Russia].

1a. Leaf blade elliptic to triangular-ovate;
ultimate segments lanceolate or ovate-lanceolate ............................... 21a. var. terebinthaceum
1b. Leaf blade broadly triangular-ovate;
ultimate segments ovate .............................. 21b. var. deltoideum

21a. Peucedanum terebinthaceum var. terebinthaceum

石防风 (原变种)  shi fang feng (yuan bian zhong)


Leaf blade elliptic to triangular-ovate; ultimate segments lanceolate or ovate-lanceolate, 0.8–3 × 0.5–1.2 cm. n = 11*.

Forest margins, grassy slopes; 200–1200 m. NE Hebei, Heilongjiang (Lebei, Shangzhi), S Jilin (Antu), Liaoning (Anshan, Qian Shan), E Nei Mongol (Da Hinggan Ling) [Russia (Siberia)].

The root is used as a regional substitute for the traditional Chinese medicine "qian hu" (see Peucedanum praeruptorum).


宽叶石防风 kuan ye shi fang feng


Leaf blade broadly triangular-ovate; ultimate segments ovate, 3–6 × 2–3.5 cm, rather thick and rigid, irregularly coarsely toothed.

Mixed forests, scrub; 200–600 m. NE Hebei (Xinglong), Heilongjiang (Yichun), S Jilin (Antu), Liaoning (Qian Shan) [Japan, Korea, Russia].


异叶前胡 yi ye qian hu


Plants 20–30 cm, pallid-green, often purplish-tinged. Stems several, hollow, puberulous above. Leaf blade long-ovate, pinnate, thinly coriaceous, abaxially strongly reticulate, white villous, margins dentate and slightly reflexed; pinnae 1–2 × 0.5–1 cm, 2–3 pairs, lateral pinnae rhombic or oblique-ovate, base cuneate or truncate, apical pinnae ovate, base cuneate, decurrent. Umbels terminal, 2–3 cm across; peduncles elongate, straight, apex villous; bracts absent; rays 8–14, 1–2 cm, 4-angled, inner faces white hispid, outer faces glabrous; bracteoles 8–10, linear, entire or 3-lobed, lobules linear or subulate; umbelules 12–16-flowered. Calyx teeth short, triangular. Petals white. Styles longer than stamens. Fruit ovoid-oblong, ca. 3 × 2 mm, glabrous; dorsal ribs prominent, lateral ribs winged, wings ca. 1 mm, ca. 1/3 width of body, thin; vittae 1 in each furrow, 4 on commissure. Fl. and fr. Aug–Oct.

- Alpine meadows in limestone areas; ca. 3000 m. NW Yunnan (Eryuan, Heqing, Lijiang).


兴安前胡 xing an qian hu


Plants 30–100 cm. Stem solitary, erect. Basal leaves numerous; blade oblong, 2–3-pinnatisect; pinnae 4–5 pairs, long-ovate, pinnatisect, pinnules 2–3 pairs; ultimate segments narrowly linear, 2–10 × 0.8–1 mm, both surfaces glabrous, glaucous, entire, apex apiculate, petioles sheathing throughout, racemes pubescent. Leaves reduced upwards, uppermost subulate. Synflorescence corymbosely branched; umbels 3–4(–10) cm across; bracts 1–3, lanceolate, glabrous and scarious; rays 10–15, 1–2(–4) cm, inner face puberulent, outer face glabrous; bracteoles 6–8, linear-lanceolate, white scarious, longer than or about equaling flowers; umbelules 8–10-flowered. Calyx teeth small, acute. Petals white. Styles longer than stamens. Fruit ellipsoid, 3–4 × 2.5–3 mm, glabrous; dorsal ribs prominent, lateral ribs winged, wings ca. 1 mm, ca. 1/3 width of body, thin; vittae 1 in each furrow, 2 on commissure. Fl. and fr. Jul–Sep.

Sandy or stony slopes in Pinus woods; 200–800 m. Heilongjiang,

华北前胡 lian ye qian hu

Plants 40–60, completely glabrous. Stem solitary, usually unbranched, thinly fluted. Basal leaves few; petioles short, sheathing throughout, scarious-margined; leaf blade long-ovate or elliptic, 1–2-pinnate/pinnatisect; pinnae 2–4 pairs, remote; ultimate segments linear-lanceolate, often slightly falcate, 10–35 × 1–3 mm, glaucous-green. Stem leaves few, reduced upwards, blade usually 3-parted. Umbels 3–6 cm across; bracts absent or 1–2, subulate, caducous; rays 7–12, 2.5–4 cm, unequal, glabrous; bracteoles 10–13, lanceolate-linear, unequal, shorter than flowers, scarious-margined; umbellules 15–20-flowered; pedicels unequal. Calyx teeth triangular-lanceolate, acute. Petals white. Stylodipodium deep purplish-red; styles longer than stylodipodium. Fruit ovoid-ellipsoid, 4.5–5 × 3–4 mm, densely hispid; dorsal ribs somewhat prominent, lateral ribs winged, wings ca. 1/3 width of body, thin; vittae 3–4 in each furrow, 4–6 on commissure. Fl. Jul. and fr. Aug.–Oct.

Dry grassy slopes; ca. 1900 m. NE Xinjiang (Barkol) [N Mongolia, Russia (Siberia)].


南川前胡 nan chuan qian hu


Plants 50–80 cm. Stem solitary, usually unbranched, thinly fluted. Basal leaves few; petioles short, sheathing throughout, scarious-margined; leaf blade long-ovate or elliptic, 1–2-pinnate/pinnatisect; pinnae 2–4 pairs, remote; ultimate segments linear-lanceolate, often slightly falcate, 10–35 × 1–3 mm, glaucous-green. Stem leaves few, reduced upwards, blade usually 3-parted. Umbels 3–6 cm across; bracts absent or 1–2, subulate, caducous; rays 7–12, 2.5–4 cm, unequal, glabrous; bracteoles 10–13, lanceolate-linear, unequal, shorter than flowers, scarious-margined; umbellules 15–20-flowered; pedicels unequal. Calyx teeth triangular-lanceolate, acute. Petals white. Stylodipodium deep purplish-red; styles longer than stylodipodium. Fruit ovoid-ellipsoid, 5–6 × 4–4.5 mm; dorsal ribs prominent, lateral ribs winged, wings ca. 1 mm, ca. 1/3 width of body, thin; vittae 3–4 in each furrow, 4–6 on commissure. Fl. Jul. and fr. Aug.

Dry grassy slopes; ca. 1900 m. NE Xinjiang (Barkol) [N Mongolia, Russia (Siberia)].


华北前胡 hua bei qian hu

Plants 40–60, completely glabrous. Stem solitary, usually unbranched, thinly fluted. Basal leaves few; petioles short, sheathing throughout, scarious-margined; leaf blade long-ovate or elliptic, 1–2-pinnate/pinnatisect; pinnae 2–4 pairs, remote; ultimate segments linear-lanceolate, often slightly falcate, 10–35 × 1–3 mm, glaucous-green. Stem leaves few, reduced upwards, blade usually 3-parted. Umbels 3–6 cm across; bracts absent or 1–2, subulate, caducous; rays 7–12, 2.5–4 cm, unequal, glabrous; bracteoles 10–13, lanceolate-linear, unequal, shorter than flowers, scarious-margined; umbellules 15–20-flowered. Calyx teeth small, triangular. Petals white, adaxially finely papillose, abaxially white pubescent. Styles longer than stylodipodium. Fruit ovoid-ellipsoid, 4.5–5 × 3–4 mm, densely hispid; dorsal ribs somewhat prominent, lateral ribs winged, wings ca. 1/3 width of body, thin; vittae 3–4 in each furrow, 4–6 on commissure. Fl. Jul. and fr. Aug.–Oct.

Dry grassy slopes; ca. 1900 m. NE Xinjiang (Barkol) [N Mongolia, Russia (Siberia)].

26a. *Peucedanum harry-smithii* var. *harry-smithii* 26a. var. harry-smithii

华北前胡 (原变种) hua bei qian hu *(yuan bian zhong)*

*Peucedanum hirsutiusculum* (Y. C. Ma) V. M. Vinogradova; *P. praeruptorum* Dunn subsp. *hirsutiusculum* Y. C. Ma.

Leaf blade abaxially densely white pubescent, dark gray-green when dry. Umbels small, 3–8(–10) cm across; rays 8–15, 1–3 cm, unequal.

Forest margins, valleys, river banks, gaps among rocks in dry valleys, waste places; 600–2600 m. SE Gansu, Hebei, S and W Henan, S Nei Mongol, S Shaanxi, C and NE Shanxi, NE Sichuan.


少毛北前胡 shao mao bei qian hu


Plants including stem, leaves, inflorescence, etc., very sparsely pubescent or subglabrous. Umbels small, 3–8(–10) cm across; rays 8–15, 1–3 cm, unequal.

Forest margins, waste places; ca. 1000 m. S and W Henan, S Shaanxi (Hu Xian, Shang Xian).


广序北前胡 guang xu bei qian hu

Plant sparsely pubescent. Primary umbel 10–16 cm across; rays 8–22, 0.5–10 cm, very unequal.

- Gaps among rocks in dry valleys; 300–2000 m. W Hebei (Xiaowutai Shan), S Shaanxi, NE Shanxi (Wutai).


紫茎前胡 zi jing qian hu

Plants 50–90 cm. Stem solidary, hollow, purplish-tinged, rough-puberulous. Basal leaves numerous, sheaths pubescent; leaf blade ovate, 3–4-pinnatisect; pinnae 4–5-paired; ultimate segments obovate-cuneate, 1.5–5 × 1–2 mm, usually 3-lobed, hirsipid on both surfaces. Synflorescence much branched, terminal umbel 6–9 cm across, lateral umbels 2–5 cm; bracts absent or 1–2, subulate, deciduous; rays 10–20, unequal, 1–5 cm, sparsely pubescent; bracteoles 8–12, linear-lanceolate, puberulous. Calyx teeth subulate. Petals white. Styles slender, longer than stamens. Fruit ovoid, 3–4 × 2.5–3 mm; dorsal ribs filiform, prominent, lateral ribs narrowly winged, wings ca. 1/3 width of body, thin; vittae 3–4 in each furrow, 6–10 on commissure. Fl. and fr. Jul–Sep.

- Sparse scrub, limestone areas on mountain slopes, rock crevices; ca. 300 m. W Guangxi (Jingxi, Wuming).


华中前胡 hua zhong qian hu

Plants 50–200 cm. Taproot roughened; rootstock stout, gray-brown, often purplish-tinged, annular leaf scars numerous and conspicuous. Leaf blade triangular-ovate in outline, 2–3-ternate, rarely 2-pinnate; pinnae 3 pairs, ternate or pinnate; terminal pinnules obovate-rhombic, 3-lobed, base cuneate, apex acute, acuminate, lateral pinnules oblique-ovate, 3-lobed or undivided, 2.5 × 1–1.5 cm, abaxially glaucous, margins coarsely toothed. Umbels 7–15(–20) cm across; bracts absent or 1, deciduous; rays 15–30, unequal, pubescent; bracteoles numerous, linear-lanceolate, shorter than the flowers; umbellules 10–30-flowered. Calyx teeth triangular-ovate, ca. 1.2 mm. Petals white. Styles slender, ca. 1.5 mm. Fruit ovoid-ellipsoid, 6–7 × 3–4 mm, tawny or gray-tawny, dorsal ribs slightly prominent, laterals ribs winged, wing ca. 1/3 width of body, thin; vittae 3 in each furrow, 8–10 on commissure. Fl. Jul–Sep, fr. Oct–Nov.


1a. Plants stout; leaf blade broadly triangular-ovate, subcoriaceous, adaxially shiny ...

1b. Plants slender; leaf blade triangular-ovate, narrower and thinner, adaxially not shiny

30a. *Peucedanum medicum* var. *medicum*

华中前胡(原变种) hua zhong qian hu (yuan bian zhong)

Plants tall and stout; leaf blade broadly triangular-ovate in outline, 20–40 × 10–20 cm, subcoriaceous, shiny adaxially.

- Wet rocky slopes, grassy places; 700–2000 m. Chongqing, N Guangdong (Lian Xian), NE Guangxi (Guanyang), E Guizhou (Zhenyuan), W Hubei (Badong, Jianshi), Hunan (Jishou, Shaoyang), W Jiangxi (Lianhua), Wugong Shan), NE Sichuan (Wanyuan).

The root is used in Hebei as a regional substitute for the traditional Chinese medicine “qian hu” (see *Peucedanum praeruptorum*).

30b. *Peucedanum medicum* var. *gracile*

岩前胡 yan qian hu

Plants slender; leaf blade triangular-ovate in outline, 14–25 × 7–12 cm, narrower and thinner, not shiny adaxially.
31. **Peucedanum morisonii** Besser ex Sprengel in Roemer & Schultes, Syst. Veg. 6: 567. 1820 ["morisoni"].

准噶尔前胡  zhun ga er qian hu

Plants 5–130 cm. Stem glabrous. Basal leaf blade broadly triangular in outline, ternate/3–4-pinnatisect; ultimate segments elongate, narrowly linear, (1–)3–10 × 0.1–0.3 cm, glabrous. Stem leaves less divided than basal, upper leaves with bladeless, lanceolate sheaths. Umbels 5–15 cm across; bracts 3–7, subulate to linear, unequal; rays 15–25(–30), unequal, spreading in flower, becoming rigidly contracted; bracteoles 5–13, linear to subulate, unequal, shorter than flowers; umbellules 25–30-flowered. Calyx teeth conspicuous, triangular. Petals white, broadly spoon-shaped, with 6 pairs of pinnules; pinnules with divisions in 3–4 pairs, or -lobed, 3–4 × ca. 1 cm, thin, papery, acute, mucronate; distal pinnules smaller and less divided. Leaves reducing upwards to a bladeless leaf, petioles wholly sheathing. Umbels few; peduncles equaling rays; umbellules 5–10-flowered. Calyx teeth obsolete. Petals white, ca. 1 mm broad; vittae 2–3 in each furrow, 2 on commissure. Fl. and fr. Jul–Aug, fr. Aug–Sep.

Scrub, grassy places; 1200–1700 m. N Xinjiang [Kazakhstan, Russia (Siberia)].

The following nine species are incompletely known and their treatment here is tentative. In many cases these species are recorded only from a few rather poor collections, often the type gathering only.


窃衣叶前胡  qie yi yie qian hu


Mountain slopes; ca. 2900 m. N Sichuan (Songpan).


华西前胡  hua xi qian hu


● Forest margins and roadsides on mountain slopes. W Sichuan (Kangding).

This species is recorded only from the holotype (J. A. Soulé s.n., P).


蒙古前胡  meng gu qian hu

Plants ca. 50 cm, glabrous. Rootstock stout. Stem solitary, shallowly fluted above. Basal leaves 6–12 cm; petioles ca. 3 cm, sheaths dilated; blade 2-pinnate, pinnules 3-paired, 2–3-pinnatifid; ultimate segments narrowly lanceolate or linear, acute, 10–15(–20) × 1–2 mm. Stem leaves few, reduced above. Bracts 1(–2), linear, ca. 4 mm; rays 10–15, fluted, unequal, up to 3.2 cm; bracteoles numerous, linear, ca. 4.5 mm, unequal, scarios-margined; umbellules numerous-flowered. Pedicels ca. 1 cm. Calyx teeth obsolete. Petals white, broadly spoon-shaped, with a fluted apex. Fruit obcordate, ca. 5.5 × 4 mm, lateral wings white, ca. 1 mm broad; vittae 2–3 in each furrow, 6 on commissure. Fl. and fr. Jul–Sep.

Wet rocky slopes, grassy places; ca. 1100 m. Chongqing, SW Sichuan.

35. **Peucedanum chinense** M. Hiroe, Umbell. World, 1572. 1979 ["chinensis"].

林地前胡  lin di qian hu

*Peucedanum diversifolium* H. Wolff, Repert. Spec. Nov. Regni Veg. 33: 247. 1933, not Bentham & J. D. Hooker (1867). Basal leaf blade broadly rombic, 4-pinnatisect; pinnacles 7–9 pairs, long-petiolulate, lower pinnacles broadly ovate-lanceolate, with 6 pairs of pinnules; pinnules with divisions in 3–4 pairs, subdecussate, ultimate segments lanceolate-linear, 3–4-parted or -lobed, 3–4 × ca. 1 cm, thin, papery, acute, mucronate; distal pinnules smaller and less divided. Leaves reducing upwards to a bladeless leaf, petioles wholly sheathing. Umbels few; peduncles elongate and erect; bracts absent; rays 5–7, unequal, ca. 3 cm, roughened; bracteoles few, linear, short and acute; umbellules 5–10-flowered. Calyx teeth obsolete. Styles short. Fruit ellipsoid; lateral ribs narrow-winged; vittae 1–3 in each furrow, 4–6 on commissure. Fl. and fr. unknown.

● Forests. W Sichuan.

This species is recorded only from the type gatherings (*Wilson 3705 & 3705*).


鄂西前胡  e xi qian hu

Plants to 50 cm. Stem rigid, hollow, sparingly branched, branches slender and elongate. Basal leaves small; petioles about equaling leaf blades, sheaths very short; leaf blade 3-ternate, pinnacles long-petiolate; pinnules sessile or subsessile, cuneate-obovate or ovate, ca. 20 × 14 mm, abaxially glauceous, parted or lobed. Synflorescence little-branched; peduncles equaling rays; bracts absent; rays 5–6, unequal, spreading in fruit; bracteoles...
absent; umbellules ca. 20-flowered; pedicels filiform, subequal. Calyx teeth conspicuous, small. Petals yellowish, oblong, with a narrow and very inflexed apex. Styles long. Mature fruit unknown, developing fruit ellipsoid, smooth; dorsal ribs filiform, lateral ribs narrowly winged; vittae 3–4 in each furrow, 4 on commissure. Fl. Jul.

- Mountain slopes. W Hubei (Yichang).

This species is recorded only from the holotype (A. Henry 3604, K).


Kitagawia pilifera (Handel-Mazzetti) Pimenov.

Plants 45 cm. Stem terete, hollow, glabrous. Basal leaf petioles ca. 8 cm; leaf blade ovate in outline, 3–4-pinnate, ca. 11 × 8 cm; pinnae 6 pairs, sessile, remote; ultimate segments linear-oblong, 1.5–7 × ca. 1 mm, rather thick, apex obtuse. Pedicules ca. 6.5 cm; bracts ca. 10, linear, very acute, about equaling rays, margins pale tawny; rays 20, ca. 3 cm, rays and pedicels densely papillose-pubescent; bracteoles 12, pinnately lobed, pubescent, exceeding flowers; umbellules ca. 30-flowered, pedicels ca. 7 mm in fruit. Calyx teeth conspicuous, small. Ovary papillose. Styles slender. Mature fruit unknown. Fl. and fr. Jul–Sep.

- Grassy slopes at forest margins. NE China.

This species is recorded only from the holotype (Fenzl 352, unlocalized).


华山前胡 hua shan qian hu

Plants 40–90 cm, essentially glabrous. Basal leaves numerous, oblong-ovate, 2-pinnate or pinnatisect, 10–20 cm; pinnae petiolulate, 5–6 pairs, pinnae 1–2 pairs, ovate, 3-lobed or parted, lobules acute, apiculate. Stem leaves reduced upwards. Synflorescence copiously dichotomously branched; umbels 1–2.5 cm across; pedicules 4–10 cm, granular-roughened or hispidulous; bracts 3–4, linear-lanceolate, 1–3 mm; rays 3–5, 2–4 cm; bracteoles 2–5, linear, 1–2 mm; umbellules 3–8-flowered, pedicels 1–2 mm. Calyx teeth triangular, minute. Petals white, obovate. Ovary pulv erous-hispid. Fruit obovate-oblong, 4–5 mm, granular-hispidulous; dorsal ribs filiform, prominent, lateral ribs narrowly winged, wings thin; vittae 1 in each furrow, 2 on commissure. Fl. Aug–Sep, fr. Oct.

- Rock crevices or sandy places in mountain valleys; 400–1000 m. W Henan (Lingbao), SE Shaanxi (Hua Shan).

The root is used in Shaanxi as a regional substitute for the traditional Chinese medicine “fang feng” (see Saposhnikovia divaricata).


云南前胡 yun nan qian hu

Herbs stout. Stem hollow, slightly roughened, little-branched, hispidulous. Basal leaves numerous, very remote. Cauline leaves 2–3-pinnatisect; ultimate segments lanceolate, entire or finely serrate, apex acute, sessile, petioles wholly sheathing, sheaths very broad. Umbels with long peduncles, hispidulous; bracts absent; terminal umbel with rays ca. 25, ca. 4 cm, subequal, pulv erous-roughened; bracteoles numerous, narrow-linear, longer than flowers; umbellules ca. 30-flowered, pedicels unequal, ca. 10 mm, roughened. Calyx teeth conspicuous. Developing fruit ellipsoid (mature fruit unknown); dorsal ribs slightly prominent, lateral ribs thinly winged; vittae 1 in each furrow, (2–)2–4 on commissure. Fl. and fr. Jul–Sep.

- Mountain slopes; ca. 2000 m. Yunnan (Kunming).

This species is recorded only from the holotype (Cavalerie s.n., P).


拉萨前胡 la sa qian hu

Stem slender, branched above. Basal leaves shortly petiolate; blade ternate-2-pinnate, pinnae 5–6, pinnately lobed; ultimate segments narrowly lanceolate, to 25 × 4 mm, shortly acuminate, margin scabrous. Upper leaves reduced upwards. Bracts absent; rays ca. 10, to 7 cm, slender, divaricate; bracteoles absent. Styles shorter than stylopodium. Mature fruit unknown. Fl. Aug.

- Hillsides. Xizang (Lhasa).

This species is recorded only from the holotype (Xixang: hills above Lhasa, Aug 1904, Walton s.n., K) and has not been included in the key because data are deficient.


川明参属 chu an ming shen shu

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs perennial, plant withered in every summer, sprouting again in autumn. Taproot long-cylindric, deep-rooted with a slender and elongated stem to soil surface. Arial stem terete, erect, base purplish, distally glaucous, branched above. Basal leaves numerous, 2–3-ternate-pinnate. Umbels loosely compound; inflorescence branches many-branched and spreading; bracts and bracteoles usually absent, rarely with 1–3 linear, membranous and deciduous bracts or bracteoles. Calyx teeth conspicuous, narrowly triangular. Petals white or purplish, midvein conspicuous. Stylopodium conic; styles much longer than stylopodium, often reflexed. Fruit ellipsoid, dorsally compressed; dorsal ribs filiform, prominent, lateral ribs narrowly winged, wings thickened; vittae 2–3 in each furrow, 4–6 on commissure. Seed face plane.

- One species.

川明参 chuan ming shen

Taproot surface pale tawny brown, inner parts white, starchy. Leaves mainly in basal rosette; petiole sheaths broad, purplish and scarious margin; leaf blade broadly triangular-ovate, ternate-2–3-pinnate; pinnules 1–2 pairs; ultimate segments ovate to long-ovate, 2–3 × 0.6–2 cm, abaxially glaucous, base cuneate or rounded, margins irregularly 2–3-lobed or dentate, apex acuminate. Umbels 3–10 cm across; rays 4–8, 0.5–6(–8) cm, very unequal. Fruit 5–7 × 2–4 mm. Fl. and fr. Apr–Jun.

- Grassy places along stream banks, also cultivated on mountain slopes; 100–800 m. Hubei, Sichuan.

The root is used in Hubei and Sichuan as a regional substitute for the traditional Chinese medicine “ming dang shen” (see Changium).


伊犁芹属 yi li qin shu

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs perennial. Taproot branching, thickened, woody, crown densely covered in fibrous remnant sheaths. Stem much-branch-ed, gray-green, glabrous. Leaves petiolate, articulate between the petiole and leaf blade; leaf blade ovate or broadly-ovate in outline, 3-pinnatisect, bluish-green; ultimate segments lanceolate or linear. Compound umbels terminal; bracts and bracteoles absent; umbellules few to many-flowered. Calyx teeth triangular, apex obtuse. Petals yellow. Stylodium depressed, base dilated, erect in fruit; style short, recurved. Fruit ellipsoid, dorsally compressed, glabrous; ribs filiform, dorsal and intermediate ribs close together, lateral ribs remote; vittae 1 in each furrow, 2 on commissure, very small. Seed face plane or slightly convex. Carpophore parted to near base.

Two species: C Asia; one species in China.

Some current authors consider this genus part of Ferula.


伊犁芹 yi li qin


Plants to 1 m. Ultimate segments of leaves 3–10 mm, rather thick, entire or 3-lobed. Umbels 5–10 cm across; rays 8–18, unequal, glabrous, sometimes with a foliaceous bract at the base; umbellules 10–20-flowered; pedicels very unequal. Petals broadly-elliptic, apex acuminate, incurved. Stylodium depressed-conic. Fruit 6–8 mm; dorsal ribs slightly prominent, lateral ribs obscure. Fl. Jun, fr. Jul.

Thin turf, gravelly slopes; 2100–2800 m. W Xinjiang (Wuqia, Zhaosu) [C Asia].


欧防风属 ou fang feng shu

Pan Zehui (潘泽惠); Mark F. Watson

Herbs biennial. Rootstock thick, long-conic. Stem hollow or solid, ribbed. Leaves pinnate, usually glabrous on both surfaces; pinnae serrate or pinnatifid, sessile. Umbels terminal and lateral; bracts and bracteoles absent; rays numerous, ascending. Calyx teeth minute, triangular. Petals ovate, yellow, incurved at apex. Stylodium short-conic; styles short, divaricate. Fruit broad ellipsoid, glabrous, strongly flattened dorsally; dorsal ribs thinly filiform, the lateral broadly winged; vittae 1 in each furrow, 2–4 on commissure. Seed face plane.

About 14 species: Asia, Europe; one species (introduced) in China.


欧防风 ou fang feng

Anethum pastinaca (Linnaeus) Wibel; Elaphoboscum sativa (Linnaeus) Ruprecht; Peucedanum pastinaca (Linnaeus) Bentham & J. D. Hooker; Selinum pastinaca (Linnaeus) Crantz.

Plants stout, 1–1.6 m high. Root yellowish-brown, up to 30 × 10 cm, fleshy becoming fibrous with age. Basal petioles ca. 13 cm, sheathing; leaf blade oblong-ovate, 20–30 × 10–16 cm, pinnate; pinnae oblong to ovate, 5–8 × 2–4.4 cm. Peduncles stout, 5–12 cm; rays 10–30, 3–8(–10) cm, unequal; umbellules ca. 1 cm across, ca. 20-flowered; pedicels 5–10 mm, slender. Petals 1–1.2 × ca. 1 mm. Fruit 5–6 × 4–6 mm. Fl. and fr. Jun–Aug. n = 11.

Widely cultivated in China [generally thought to be native to Europe; widely cultivated].

The root is rich in starch and sugar and is used as food (parsnip), animal fodder, and for wine making. The sap is liable to cause skin irritation by sensitizing skin to UV radiation.
**Pichleria** Stapf & Wettstein.

Herbs, biennial or monocarpic perennial. Root fusiform, yellow-red. Stem usually solitary, densely pubescent, angled, corymbose-branched, base clothed in fibrous remnant sheaths. Leaves 1–2 pinnatisect. Inflorescence compound umbels; bracts and bracteoles present; flowers hermaphrodite. Calyx teeth minute. Petals whitish, obcordate, apex narrow, flexed, outer petals slightly enlarged (radiant). Fruit broadly ovate, strongly dorsally compressed, densely minute-pubescent; dorsal ribs filiform, marginal ribs broadly thin-winged, distal parts inflated and corky; outer mesocarp layer parenchymatous, inner layer sclerified; vittae large, 1 in each furrow, 2 on commissure. Seed face plane. Carpophore 2-parted to base.

Four species: C and SW Asia; one species in China.


**艾叶芹 ai ye qin**

Plants 20–80 cm. Basal leaves numerous, petioles short; blade ovate to lanceolate-ovate, 6–14 cm, densely gray pubescent; ultimate segments ovate, 1.5–5 cm, sessile, margin lacinate to lobed. Upper leaves similar to basal, reduced upwards with enlarged, toothed sheaths. Umbels 5–14 cm across; bracts and bracteoles 4–9, linear-lanceolate to narrowly linear, short and reflexed, almost completely membranous, whitish, hisrate to tomentose; rays 5–25, to 6 cm, ca. equal; umbellules 20–25-flowered; pedicels hispidulous (becoming glabrous), filiform, ca. 1 cm at maturity. Calyx teeth minute, triangular. Stylodium flattened, margin undulate; styles to 1 mm, reflexed. Fruit 6–9 × 5–7 mm. 2n = 6.

Stony clayey slopes, rocky areas; 1200–1500 m. SW Xinjiang (Wuqia) [Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].


**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. Stylodium 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 slightly concave. Carpophore parted to base, usually persistently.

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. fargesi*

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 commisure.
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. moellendorfii
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
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.
21b. Rays 20–25; bracteoles lanceolate, ciliate at apex, equal to or slightly longer than pedicels 

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. franchetti
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


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
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 × 5–7 mm, densely pubescent, wings ca. 1.5 mm wide, wider than width of mericarp body; vittae filiform, more than half the length of the mericarp body, 1–2 in each dorsal furrow, 1–3 in lateral furrows, 2 on commissure often with 2 additional fragmentary vittae. Seed face plane. 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.


This species has reputed medicinal value.


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 length of the mericarp body, 1–2 in each dorsal furrow, 1–3 in lateral furrows, 2 on commissure often with 2 additional fragmentary vittae. Seed face plane. Fl. and fr. Jul–Sep.

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


大叶独活 da ye du huo

Platypsyrenia olgae (Regel & Schmalhausen) Korovin; Tetra
taenium 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 yellow-hispid; bracteoles 5–7, linear, nearly as long as umbellule; umbra absent; rays 10–40(or more), unequal, 2–5 cm, densely 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; vitae 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].


尼泊尔独活 ni po er du huo

Heracleum nepalense var. bivittatum C. B. Clarke; Tetra
taenium 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, pinnain 3–7 pairs; leaflets broadly ovate, 9–20 × 5–12 cm, both surfaces finely pubescent, especially along veins, margins serrate. Cauline leaves similar to the basal, reduced upward, smaller, 3-lobed sessile on expanded sheaths. Umbels numerous, 6–11 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; radiate 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; vitae 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–Aug. Fl. Jun–Aug, fr. Aug–Sep.

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

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


椴叶独活 duan ye du huo

Plants stout, 1–2 m high. Root cylindrical. Basal leaves long-petiolate; leaf blade terebrate, 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 obso
te. 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; vitae solitary in each furrow, filiform, 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.


短毛独活 duan mao du huo

Plants stout, 1–2 m tall, hispidulous throughout. Root cylin
drical. Stem solitary, branched. Basal and lower petioles 10–
30 cm; leaf blade terebrate or terebrate-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 umbel
lute. Calyx teeth obsolete. Petals white, on outer flowers of um
bels 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

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 .............. 11a. 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

2b. Fruit suborbicular, dorsal and lateral vittae 2 per mericarp in total

11a. Heracleum moellendorffii var. moellendorffii


Heracleum barbatum Ledebour subsp. moellendorffii (Hance) M. Hiroe; *H. dissectum* Ledebour subsp. moellendorffii (Hance) Voroshilov; *H. lanatum* Michaux subsp. moellendorffii (Hance) H. Har; *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.


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. var. subbipinnatum


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].


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.


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.


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, sparingly 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 broader-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, stream sides; 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.


**独活** ROADCAST **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 obcordate, deeply lobed. Ovary scabrous. Fruit suborbicular, ca. 7 × 7 mm; vittae solitary in each furrow, 2 on commissure, about 2/3 length of mericarp. Seed face plane. Fl. and fr. Jul–Oct.

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

This species has reputed medicinal value.


**糙独活** ROADCAST **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 1–2, 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–Jun, fr. Aug–Sep.

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


**山地独活** ROADCAST **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 1/2 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.


**兴安独活** ROADCAST **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].


**多裂独活** roadcast **duo lie du huo**

Plants 60–100 cm tall. Root cylindrical. Stem solitary, branched above. Basal leaves 2-pinnate; pinnae 3–4 pairs, lacerate-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

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

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


尖叶独活 jian ye du huo


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 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.


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 × 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.

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

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


思茅独活 si mao du huo

Plants to 80 cm high. Root cylindrical. Stem few-branch- ed, hirsute. Basal leaves ternate-1–2-pinnate, ultimate segments ovate-oblong or ovate-lanceolate, 2–8 × 2–4.5 cm, sparsely his- rute 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-flow- ered. 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.


鹤庆独活 he qing du huo


- Forest margins, scrub, grassy slopes; 2000–2200 m. Yunnan.

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


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-thomibic, 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-flow- ered. 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).


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,

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

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


狭茎独活 xia chi du huo


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

This species has reputed medicinal value (in Yunnan).


永宁独活 yong ning du huo


- Sparsé forests, coniferous forest margins, scrub, alpine meadows, arid grassy slopes, stream-sides; 1800–4500 m. W Sichuan, E and S Xinjiang, C and N Yunnan [Bhutan, NE 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. Pinnæ ovate-oblong, apex mucronate or obtuse ........................................... 28a. var. candicans

1b. Pinnæ 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.

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

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

This variety has reputed medicinal value.


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.

Pinnæ 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 Xinjiang, C and NW Yunnan [Bhutan, NE India, Nepal, Sikkim].


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. 2

29b. Calyx teeth minute, inconspicuous; lateral ribs of fruit narrowly winged.

29a. Heracleum millefolium var. millefolium

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

Primary pinnae 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


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.


大瓣芹属 da ban qin shu

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

Neoplatytaenia Geldikhanov; Platyaenia Nevski & Vvedensky.

Herbs, perennial. Taproot fusiform, crown usually clothed with fibrous remnant sheaths. Stem usually solitary. Basal and lower leaves 1–2-pinnate. Umbels terminal and lateral; umbellules 10–30-flowered. Calyx teeth minute or conspicuous. Petals white, rarely pale yellow, outer flowers of the umbel radiant with outer petals enlarged, broad obovate, apex deeply 2-lobed, abaxially puberulent. Stylopodium conic; styles slightly longer than stylopodium, reflexed. Fruit ovoid or ovoid-oblong, pilose to glabrous, dorsally compressed; dorsal and intermediate ribs raised, rarely undulate, lateral ribs broadly winged or nearly as wide as the dorsal; vittae 1 in each furrow, 2 on commissure, filiform, usually extending to the base or at least to 3/4 length of mericarp. Seed face plane or slightly concave. Carpophore 2-parted to base.

About 20 species: C Asia, SW Asia (Iran); four species in China.

1a. Calyx teeth conspicuous, unequal; lateral ribs of fruit broadly winged.

2a. Petals white, purple veining absent; fruit pilose; basal leaves pinnate, pinnae broad-ovate to ovate-oblong, 20–30 × 10–20 mm. 1. S. transiliensis

2b. Petals white or yellowish-white, with purple medial veins; fruit glabrous; basal leaves 2-pinnate, ultimate segments linear, ca. 5 × 1 mm. 2. S. rubtzovii

1b. Calyx teeth minute, inconspicuous; lateral ribs of fruit narrowly winged.
3a. Fruit ribs undulate; basal leaves 1–2-pinnate, pinnae obovate-oblong, 5–8 × 3–4 mm ...................... 3. *S. pimpinelloides*

3b. Fruit ribs filiform, elevated; basal leaves pinnate, pinnae obovate or broad-ovate, 30–60 × 25–50 mm .............. 4. *S. dasycarpa*


大瓣芹 da ban qin

_Heracleum translilense_ (Regel & Herder) O. Fedtschenko & B. Fedtschenko.

Plants 20–60 cm tall. Stem slender, branching, glabrous rarely sparsely puberulent. Basal leaves pinnate; pinnae 5–6 pairs, broad-ovate to obovate-oblong, 2.3 × 1–2 cm, margin pinnatifid to pinnatisect. Cauline leaves similar to the basal, reduced upward with strongly expanding sheaths; pinnae lanceolate, glabrous or finely pubescent. Bracts 3–5, linear; rays 4–15, subequal, 3–4 cm, densely hairy with spreading hairs; bracteoles 3–5, linear, nearly as long as umbellule; flowers 15–20 per umbellule. Calyx teeth conspicuous, unequal. Petals white. Fruit ovoid, 6–8 × 4–5 mm, pilose; lateral ribs broadly winged; dorsal vittae filling the furrow, 3/4 length of mericarp, lateral vittae sometimes shorter, commissure vittae narrower than dorsal. Fl. and fr. Jul–Sep.

Grassy slopes, alpine meadows; 1900–3200 m. WC Xinjiang [Kazakhstan, Kyrgyzstan].


光果大瓣芹 mao guo da ban qin

_Platytaenia rubtzovii_ Schischkin in Schischkin & Bobrov, Fl. URSS 17: 357. 1951; _Zosima rubtzovii_ (Schischkin) M. Hiroe.

Plants 40–60 cm tall. Taproot 1–2 cm across. Stem profusely branched, villose. Basal leaves 2-pinnate; ultimate segments linear, 4–6 × ca. 1 mm, puberulent. Cauline leaves similar to the basal, reduced upward. Umbels terminal and many lateral, 3–8 cm across; bracts 2–3, lanceolate, villose, membranous at margins; rays 7–13, unequal, 1.5–3 cm, pubescent; bracteoles 5, similar to the bracts; umbellules 15–20-flowered. Calyx teeth conspicuous, triangular. Petals white or yellowish-white, medial veins purple. Fruit ovoid, 5–7 × 3–4 mm, glabrous; dorsal and intermediate ribs filiform, lateral ribs broadly winged; vittae extending to base of mericarp, commissure vittae shorter than dorsal. Seed face plane. Fl. and fr. Jun–Aug.

Pebbly slopes, rock crevices. N Xinjiang (Ili) [Kazakhstan].


密毛大瓣芹 mi mao da ban qin


Plants small, 25–40 cm tall. Taproot ca. 1 cm across. Stems 1–2, branched from base, pubescent. Basal leaves rosetate, pinnate; pinnae 3–4 pairs, pinnatifid, obovate-oblong, 5–8 × 3–4 mm, both surfaces densely pubescent, olivaceous; petiole short. Cauline leaves similar to basal, reduced upward. Umbels terminal, 2–5 cm across; bracts 4–6, lanceolate, densely villose, with membranous margins; rays 5–10, subequal, 1.5–2 cm, pubescent; bracteoles similar to the bracts, shorter than pedicels. Calyx teeth minute. Petals pale yellow. Fruit ovoid, 5–7 × 3–5 mm, puberulent; all ribs raised, undulate, narrowly winged; vittae reaching to the base of mericarp. Seed face slightly concave. Fl. and fr. Jul–Aug.

Arid pebbly slopes in alpine zone; 2600–3100 m. SW Xinjiang (Wusia) [Kazakhstan].


毛果大瓣芹 mao guo da ban qin


Plants small, 3–50 cm tall. Taproot ca. 1.5 cm across, crown semi-woody. Stem single, little-branched, pubescent. Basal leaves pinnate; pinnae 3–4 pairs, ovate or broad-ovate, 3–6 × 2.5–5 cm, 2–3-lobed, both surfaces sparsely pubescent, margins sharply serrate. Cauline leaves similar to the basal, reduced upward. Umbels 4–6 cm across; bracts 4–6, linear-lanceolate, densely pubescent, with narrow membranous margins; rays 4–14, unequal, up to 7 cm, densely pubescent; bracteoles similar to the bracts, connate at the base, nearly as long as umbellule; flowers 20–30 per umbellule. Calyx teeth minute. Petals white. Fruit ovoid-oblong, ca. 10 × 6 mm, puberulent; dorsal and intermediate ribs filiform, raised, lateral ribs narrowly winged; vittae reaching to the base of mericarp. Seed face plane. Fl. and fr. Jul–Aug.

Grassy slopes, meadows; 2000–3300(–3000) m. Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].

98. **TORDYLIOPSIS** de Candolle, Prodr. 4: 199. 1830.

阔翅芹属 kuo chi qin shu

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

teeth linear, unequal. Petals greenish- or purplish-white, obovate, dimorphic, outer petals in umbellules enlarged (radiant), apex notched, narrowly in flexed. Stylodium domed; styles long. Fruit ellipsoid, strongly compressed dorsally, sparsely hairy when young, smooth at maturity; dorsal ribs inconspicuous, lateral ribs extended into broad wings, wings with strengthening cells beneath the inner margin; vittae 1 in each furrow, clavate, extending for more than 1/2 fruit, 1–4 or absent on commissure (often abortive). Seed face plane. Carpophore 2-cleft to base.

One species: Bhutan, China, Nepal, Siberia.

1. Tordyliopsis brunonis de Candolle, Prodr. 4: 199. 1830.

珠峰阔翅芹 zu feng kuo chi qin

_Heracleum brunonis_ (de Candolle) C. B. Clarke.

Plants 20–60 cm. Basal petioles 10–25 cm; leaflets 5–9, oblong-ovate, 2–3.5 × 1.5–3 cm, sessile, base rounded, margin irregularly serrate, apex acute, softly pubescent especially abaxially. Umbels 4–6 cm across; rays 4–10, 1.5–3 cm, densely softly pubescent; bracts 4–6, lanceolate-acuminate, 13–30 × 2–5 mm; umbellules 1.5–2 cm across; bracteoles similar to bracts, overtopping flowers. Outer radiant petals to 7 × 4 mm. Styles 3–4 mm. Fruit 6–7 × 5–6 mm, wings ca. 1 mm. Fl. Jul–Aug, fr. Aug–Sep.

Subalpine moist dwarf scrub, among shrubs and boulders; 4200–4300 m. S Xizang [Bhutan, Nepal, Siberia].


防风属 fang feng shu

Pan Zehui (潘泽惠); Mark F. Watson

Herbs perennial, glabrous. Rootstock thick and branched, annular, crowned surrounded by fibrous remnant sheaths. Stem much-branched from base, thinly ribbed, branches almost equaling stem. Leaves 2–3-pinnate/pinnatisect. Umbels terminal and lateral; bracts absent; bracteoles several, linear-lanceolate. Calyx teeth short, triangular-ovate. Petals white, obovate with incurved tip, glabrous. Stylodium conic; styles short, elongated and reflexed in fruit; ovary densely white tuberculate. Fruit oblong-ellipsoid, strongly dorsally compressed; dorsal ribs slightly prominent, lateral ribs narrowly winged; vittae 1 in each furrow, one large vittae in each rib, 2 on commissure. Seed face plane.

One species: China, Korea, Mongolia, Russia (E Siberia).


防风 fang feng


Plants 30–80 cm high. Rootstock to 2 cm thick. Basal leaves numerous; petioles flattened, with ovate sheaths; leaf blades oblong-ovate to broad-ovate, 14–35 × 6–8(18) cm, 2-pinnate; pinnae 3–4 pairs, petiolulate; ultimate segments linear-lanceolate or cuneate-ovate, 3-lobed at apex, 2–5 × 0.5–2.5 cm. Leaves reduced upwards. Umbels numerous, ca. 6 cm across; peduncles 2–5 cm; rays 5–7, 3–5 cm; bracteoles 4–6, ca. 3 mm, acuminate; umbellules 4–5-flowered. Petals ca. 1.5 mm. Fruit 4–5 × 2–3 mm, tuberculate when young, becoming smooth when mature. Fl. Aug–Sep, fr. Sep–Oct. n = 8*.

Scrub, hillsides, grasslands, stony slopes; 400–800 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shanxi, Shaanxi [Korea, Mongolia, Russia (E Siberia)].

The root is used as the important traditional Chinese medicine “fang feng.”


胡萝卜属 hu luo bo shu

She Menglan (佘孟兰 Sheh Meng-lan); Mark F. Watson

Herbs biennial. Stem solitary erect, branching, retrorsely hispid. Basal leaves petiolate; blade pinnately decompound, ultimate segments small and narrow. Leaves reduced upwards becoming sessile, wholly sheathing, divisions narrow and elongate. Umbels terminal and axillary, loosely compound; bracts numerous, pinnate, rarely entire, usually reflexed; rays numerous, spreading or incurved after anthesis, tightly compact in fruit; bracteoles numerous, toothed or entire; umbellules many-flowered, central flowers usually sterile with enlarged purple petals. Pedicels unequal. Calyx teeth obsolete to conspicuous. Petals white or yellow, obcordate, with an inflexed apex, outer petals in outer flowers of an umbellule enlarged and radiant. Stylodium conic; styles short. Fruit ellipsoid, dorsally compressed; primary ribs filiform, bristly; secondary ribs winged, wings with glochidiate prickles; vitiae 1 in furrows under the secondary ribs, 2 on commissure. Seed face shallowly concave to nearly plane. Carpophore entire or bifid at apex. (Generic description relates to Chinese taxa only.)

About 20 species: N Africa, SW Asia, Europe; cultivated and adventive worldwide in temperate regions; one species in China.

野胡萝卜 ye hu luo bo

Plants to 120 cm. Leaves oblong, 2–3-pinnate/pinnatisect; ultimate segments linear to lanceolate, 2–15 × 0.5–4 mm, glabrous to hispid especially on the veins and margins, acute, mucronate. Peduncles 10–55 cm, retrorsely hispid; bracts foliaceous, pinnate, rarely entire, lobes linear, 3–30 mm, margin scarious; rays 2–7.5 cm, unequal; bracteoles 5–7, linear, entire or 2–3-lobed, more or less scarious and ciliate, equaling or exceeding flowers. Petals white, sometimes yellow or pinkish. Fruit 3–4 × ca. 2 mm. Fl. May–Jul.

Mountain slopes, ruderal areas, also widely cultivated; 2000–3000 m. Anhui, Guizhou, Hubei, Jiangsu, Jiangxi, Sichuan, Zhejiang [N Africa, SW Asia, Europe; cultivated and adventive worldwide in temperate regions].

The fruit used for medicine ("hu luo bo") and oil.

1a. Taproot thickened, elongate terete or clavate, fleshy, reddish, reddish-yellow, or yellow (a carrot) .................................................... 1b. var. *sativa*
1b. Taproot slender, branched, woody, not fleshy, usually brown .............................................. 1a. var. carota

1a. *Daucus carota* var. *carota*
野胡萝卜 (原变种) ye hu luo bo (yuan bian zhong)

Taproot slender, branched, woody, not fleshy, usually brown.

Mountain slopes, ruderal areas; 2000–3000 m. Anhui, Guizhou, Hubei, Jiangsu, Jiangxi, Sichuan, Zhejiang [N Africa, SW Asia, Europe; adventive worldwide in temperate regions].

1b. *Daucus carota* var. *sativa* Hoffmann, Deutschl. Fl. 91. 1791.
胡萝卜 hu luo bo

*Daucus carota* subsp. *sativa* (Hoffmann) Archangeli.

Taproot thickened, elongate terete or clavate, fleshy, reddish, reddish-yellow, or yellow.

Widely cultivated in China [of cultivated origin; cultivated worldwide].

The root is widely used as a vegetable (carrot).