

32. ALLIUM Linnaeus, Sp. Pl. 1: 294. 1753.

葱属 *cong shu*

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Caloscordum Herbert.

Herbs perennial, bulbiferous, sometimes with well-developed, thick or thin rhizomes, rarely with stolons or tuberous roots, usually with onionlike, leeklike, or garliclike odor when fresh. Bulb covered with a tunic. Leaves sessile, very rarely narrowed into a petiole, with a closed leaf sheath at base, linear, linear-lanceolate, or lorate to orbicular-ovate, cross section flat, angled, or semiterete to terete, fistulose or solid. Scape terminal or lateral, sheathed or naked. Inflorescence a terminal umbel, sometimes with bulblets, rarely flowerless and with bulblets only, enclosed in a spathe-like bract before anthesis. Pedicels with or without basal bracteoles. Flowers bisexual, very rarely degenerating into unisexual (when plants dioecious). Perianth segments free or united into a tube at base. Filaments usually connate at base and adnate to perianth segments, entire or toothed. Ovary with 1 to several ovules per locule; septa often containing nectaries opening by pores at base of ovary. Style simple; stigma entire or 3-cleft. Capsule loculicidal. Seeds black, rhomboidal or spheroidal.

About 660 species: N hemisphere, mainly in Asia, some species in Africa and Central and South America; 138 species (50 endemic, five introduced) in China.

Most Eurasian species have the base chromosome number $x = 8$, whereas North American species predominantly have $x = 7$. Nearly all species with $x = 10$ and 11 occur in SW China.

Most species of *Allium* are edible, and some have long been cultivated in China and elsewhere, e.g., *A. cepa*, *A. chinense*, *A. fistulosum*, *A. porrum*, *A. sativum*, and *A. tuberosum*.

- 1a. Leaves 1–3, linear to orbicular-ovate, base usually narrowed into a petiole; ovary base often constricted into a short stipe; ovules 1 per locule.
 - 2a. Leaf 1, long petiolate, ovate to broadly elliptic-ovate, base cordate 4. *A. funckii*folium
 - 2b. Leaves 2 or 3.
 - 3a. Outer perianth segments narrower than inner ones.
 - 4a. Base of leaf blade cuneate, decurrent 1. *A. victorialis*
 - 4b. Base of leaf blade rounded to cordate, not decurrent 2. *A. listera*
 - 3b. Outer perianth segments as wide as or wider than inner ones.
 - 5a. Scape shorter than leaves, 2–5 cm, covered with leaf sheaths for 3/4–4/5 its length 5. *A. nanodes*
 - 5b. Scape longer than leaves, 10–60 cm, covered with leaf sheaths only at base.
 - 6a. Leaves lanceolate-oblong to ovate-oblong, base rounded to cordate, petiole distinct 3. *A. ovalifolium*
 - 6b. Leaves linear, linear-lanceolate, elliptic-lanceolate, elliptic-oblong, or rarely narrowly elliptic, base narrowed, petiole indistinct 6. *A. prattii*
 - 1b. Leaves several, lorate or linear, cross section semiterete or terete, solid or fistulose, base usually not narrowed into a petiole; ovules 2 to several per locule; if leaf base narrowed into a petiole or ovules 1 per locule then bulb tunic never distinctly reticulate.
 - 7a. Roots thick and fleshy, sometimes subtuberous; leaves with distinct midvein; scape usually 2- or 3-angled; ovules 1 or 2 per locule.
 - 8a. Ovules 1 per locule (in *A. omeiense* a few ovaries in same umbel with 2 ovules per locule).
 - 9a. Umbel laxly fascicled, few flowered; pedicels unequal; style much shorter than ovary; stigma 3-cleft 16. *A. trifurcatum*
 - 9b. Umbel hemispheric to globose, many flowered; pedicels equal; style equaling or longer than ovary; stigma entire, punctiform.
 - 10a. Scape terminal 7. *A. guanxianense*
 - 10b. Scape lateral.
 - 11a. Leaves lanceolate to linear-lanceolate, distinctly contracted at base; filaments longer than perianth segments 8. *A. xiangchengense*
 - 11b. Leaves linear or lorate to lorate-oblong, not contracted at base; filaments shorter than to subequaling perianth segments.
 - 12a. Perianth segments 4–7.5 mm, free; filaments slightly shorter than to subequaling perianth segments 9. *A. hookeri*
 - 12b. Perianth segments 9–11 mm, connate at base into a tube ca. 1 mm; filaments ca. 1/2 as long as perianth segments 10. *A. omeiense*
 - 8b. Ovules 2 per locule.
 - 13a. Perianth yellow, segments united for ca. 1 mm at base 11. *A. chienchuanense*

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- 13b. Perianth white, red, purple-red, or dark purple, segments free.
- 14a. Filaments connate into a tube for 2/3–3/4 their length 15. *A. cyathophorum*
- 14b. Filaments connate only at base.
- 15a. Perianth white, segments lanceolate, apex acuminate or irregularly 2-lobed 12. *A. fasciculatum*
- 15b. Perianth red, purple-red, or dark purple, rarely whitish, segments oblong, narrowly so, or ovate-oblong, apex retuse, truncate, or obtuse.
- 16a. Perianth stellately spreading, reflexed after anthesis, inner and outer segments similar; pedicels straight 13. *A. wallichii*
- 16b. Perianth campanulate, not reflexed after anthesis, inner segments somewhat longer and narrower than outer ones; pedicels nodding at apex 14. *A. macranthum*
- 7b. Roots thin; leaves without distinct midvein; scape terete or several angled; ovules 2 to several per locule.
- 17a. Bulb usually solitary, globose, ovoid-globose, or ovoid (if cylindrical to ovoid-cylindric, then leaves thick, terete, and fistulose); rhizomes obscure.
- 18a. Leaves usually thick, terete, fistulose, smooth.
- 19a. Bulb flattened globose, globose, or ovoid-globose, rarely cylindrical with thickened base; base of inner filaments 1-toothed on each side (if entire, then scape often undeveloped).
- 20a. Scape solid 100. *A. galanthum*
- 20b. Scape fistulose.
- 21a. Scape developed; plants propagated by seeds or bulblets 98. *A. cepa*
- 21b. Scape usually undeveloped; plants propagated by bulbs.
- 22a. Bulb ovoid-globose to ovoid 99. *A. cepiforme*
- 22b. Bulb narrowly ovoid or cylindrical-ovoid 98. *A. cepa*
- 19b. Bulb cylindrical to ovoid-cylindric; filaments entire.
- 23a. Filaments shorter than perianth segments, connate into a tube for 1/3–3/4 their length 102. *A. atrosanguineum*
- 23b. Filaments shorter or longer than perianth segments, connate only at base.
- 24a. Perianth pale red, pale purple, or purple-red.
- 25a. Pedicels unequal, shorter than to nearly as long as perianth; filaments 1/3–1/2(–2/3) as long as perianth segments 103. *A. schoenoprasum*
- 25b. Pedicels subequal, 1.5–3 × as long as perianth; filaments slightly shorter than to longer than perianth segments.
- 26a. Perianth rose pink or dark pink; filaments slightly shorter than to equaling perianth segments 105. *A. maximowiczii*
- 26b. Perianth pale purple; filaments longer than perianth segments 106. *A. ledebourianum*
- 24b. Perianth yellow to white.
- 27a. Leaves and scape ± thin, to 5 mm thick; perianth yellow or pale yellow 95. *A. chrysanthum*
- 27b. Leaves and scape robust, more than 5 mm thick; perianth white or yellowish white.
- 28a. Bulb ovoid-cylindric, robust, tunic red-brown, thinly leathery; perianth yellowish white; pedicels slightly shorter than to 2 × as long as perianth 96. *A. altaicum*
- 28b. Bulb cylindrical, tunic usually white, rarely light red-brown, membranous; perianth white; pedicels 2–3 × as long as perianth 97. *A. fistulosum*
- 18b. Leaves slender, flat, triangular-flat, semiterete, or rarely terete, fistulose.
- 29a. Ovules 4 or more per locule.
- 30a. Perianth segments united into a tube proximally.
- 31a. Scape (15–)20–50 cm; pedicels (4.5–)7–11 cm; perianth segments 7–10 mm; ovules (5 or)6(–8) per locule 137. *A. neriniflorum*
- 31b. Scape 15–30(–40) cm; pedicels 0.8–4(–7) cm; perianth segments 5–7(–8) mm; ovules (3 or)4 per locule, rarely 1 or 2 locules with 5 or 6 ovules.
- 32a. Perianth red to purple 135. *A. tubiflorum*
- 32b. Perianth white 136. *A. inutile*
- 30b. Perianth segments free.
- 33a. Filaments connate and adnate to perianth segments for 1/2–2/3 their length.
- 34a. Leaves linear, 4–6(–8) mm wide; perianth cupular, segments broadly elliptic, 8–11 × 4–4.5 mm 129. *A. oreophilum*
- 34b. Leaves broadly linear, (5–)10–25 mm wide; perianth narrowly campanulate, segments linear-oblong, 7–10(–15) × 2.5–3 mm 134. *A. winklerianum*
- 33b. Filaments connate and adnate to perianth segments only at base.
- 35a. Leaves 1(or 2); perianth segments 6–6.5 mm, without strong midvein; ovary stipitate 133. *A. fetisowii*
- 35b. Leaves (1 or)2 or 3; perianth segments 4.5–5.5 mm, with strong midvein; ovary sessile.

- 36a. Perianth red to purple-red 132. *A. robustum*
 36b. Perianth white or whitish lilac to lilac-pink.
 37a. Leaves 1–1.5(–2) cm wide, apex gradually attenuate 130. *A. tulipifolium*
 37b. Leaves 0.7–1.5 cm wide, apex acute 131. *A. roborowskianum*
- 29b. Ovules 2 per locule.
 38a. Inner filaments 1-toothed on each side at base, apex of tooth long filiform and longer than anther-bearing cusp of filament.
 39a. Umbel with flowers only; filaments longer than perianth segments 127. *A. porrum*
 39b. Umbel with both flowers and bulblets; filaments shorter than perianth segments 128. *A. sativum*
- 38b. Inner filaments entire or, if 1-toothed on each side, apex of tooth not filiform and never longer than anther-bearing cusp of filament.
 40a. Perianth blue, usually becoming bluish purple when dried.
 41a. Leaves flat, abaxially 1-angled, usually twisted when dried 122. *A. caeruleum*
 41b. Leaves semiterete, not twisted when dried 123. *A. caesium*
- 40b. Perianth white, pale red, red, purple-red, purple, or pale green.
 42a. Filaments not more than 2/3 as long as perianth segments.
 43a. Pedicels ca. 3 × as long as perianth 126. *A. jacquemontii*
 43b. Pedicels shorter than or subequaling perianth.
 44a. Scape 10–15(–20) cm; perianth segments obtuse or attenuate at apex; broadened part of inner filaments with 1 small tooth on each side 124. *A. schoenoprasoides*
 44b. Scape (15–)25–40 cm; perianth segments acute at apex; broadened part of inner filaments entire 125. *A. sairamense*
- 42b. Filaments more than 2/3 as long as perianth segments.
 45a. Plants dioecious; female flowers 1 per scape; male flowers 2–4(or 5) per scape 138. *A. monanthum*
 45b. Plants not dioecious; flowers bisexual, more than 2 per scape.
 46a. Pedicels ebracteolate or only a few bracteolate at base.
 47a. Pedicels equaling or slightly longer than perianth; ovary without concave nectaries at base; filaments 2/3–3/4 as long as perianth segments 107. *A. grisellum*
 47b. Pedicels more than 2 × as long as perianth; ovary with concave nectaries at base; filaments equaling or longer than perianth segments.
 48a. Leaves flat; pedicels unequal; inner filaments with a rounded, irregularly denticulate lobe on each side near base 112. *A. songpanicum*
 48b. Leaves semiterete; pedicels equal or subequal; inner filaments entire or with an entire tooth on each side near base.
 49a. Ovary tuberculate; style slightly exerted 120. *A. pallasii*
 49b. Ovary smooth; style conspicuously exerted.
 50a. Perianth pink to pale purple-red; filaments slightly longer than perianth segments 115. *A. eusperma*
 50b. Perianth white; filaments ca. 2 × as long as perianth segments 116. *A. maowenense*
- 46b. All pedicels subtended by bracteoles.
 51a. Bulb tunic leathery, splitting along veins; perianth segments pale green with green midvein 117. *A. sabulosum*
- 51b. Bulb tunic membranous or papery, not splitting, or only apex splitting and becoming fibrous or reticulate; perianth segments white, pale red, red, or purple-red to dark purple, rarely pale green.
 52a. Bulb ovoid or narrowly so.
 53a. Leaves 3–5-angled in cross section, fistulose; scape lateral; base of inner filaments 1-toothed on each side 108. *A. chinense*
- 53b. Leaves semiterete or triangular in cross section, fistulose at least basally; base of inner filaments entire or occasionally 1-toothed on each side.
 54a. Leaves 1–2 mm wide, semiterete; perianth white or pale red, sometimes greenish.
 55a. Filaments slightly longer than to 1.5 × as long as perianth segments; ovary with concave nectaries at base covered by hoodlike projections 109. *A. yanchiense*
 55b. Filaments shorter or slightly longer than perianth segments; ovary without concave nectaries at base 113. *A. julducicola*
- 54b. Leaves 2–5 mm wide, 3-angled or -keeled to obscurely 3-angled; perianth red to purple or lilac-pink to red-violet.
 56a. Bulb tunic thinly leathery, split and becoming fibrous and subreticulate, rarely subentire; leaves keeled to obscurely 3-angled, rarely subfistulose near base;

- umbel globose, densely many flowered; perianth lilac-pink to red-violet 110. *A. sacculiferum*
- 56b. Bulb tunic membranous to scarious or subpapery, sometimes apex laciniate to fibrous; leaves 3-angled, subfistulose; umbel subfascicled to globose, laxly many flowered; perianth red to purple 111. *A. thunbergii*
- 52b. Bulb ovoid-globose to subglobose (if ovoid, then ovary with concave nectaries at base without hoodlike projections).
- 57a. Pedicels equaling to slightly longer than perianth 119. *A. glomeratum*
- 57b. Pedicels more than 2 × as long as perianth.
- 58a. Leaves 0.5–1.5 mm wide, terete; scape covered with leaf sheaths for 1/3–1/2 its length; ovary tuberculate 118. *A. delicatulum*
- 58b. Leaves 1–5 mm wide, flat, semiterete, or triangular-semiterete; scape covered with leaf sheaths for less than 1/3 its length; ovary smooth.
- 59a. Leaves flat; umbel without bulblets; filaments 1.5–2 × as long as perianth segments 114. *A. tanguticum*
- 59b. Leaves semiterete or triangular-semiterete; umbel ± with bulblets; filaments shorter than perianth segments 121. *A. macrostemon*
- 17b. Bulbs usually several in a cluster, cylindric, conical, or ovoid-cylindric, rarely ovoid; rhizomes well developed.
- 60a. Bulb tunic reticulate, subreticulate, or laxly fibrous.
- 61a. Perianth pale blue to blue or purplish blue.
- 62a. Filaments shorter than perianth segments.
- 63a. Perianth segments narrowly oblong to narrowly ovate-oblong, 11–14(–17) mm, margin entire; filaments usually ca. 4/5 as long as perianth segments; style usually 2–3 × as long as ovary 22. *A. beesianum*
- 63b. Perianth segments ovate or ovate-oblong, 6–10 mm, at least margin of inner ones irregularly denticulate; filaments usually 1/2–2/3 as long as perianth segments; style shorter than or subequaling ovary.
- 64a. Perianth segments acuminate at apex, equal, irregularly denticulate at margin, rarely outer ones entire; leaves abaxially keeled, usually twisted when dry 23. *A. yuanum*
- 64b. Perianth segments obtuse at apex, inner ones longer and wider than outer, only inner ones irregularly denticulate at margin; leaves flat 24. *A. sikkimense*
- 62b. Filaments longer than perianth segments.
- 65a. Leaves semiterete 25. *A. cyaneum*
- 65b. Leaves flat.
- 66a. Pedicels extremely unequal, 2–4 × as long as perianth 28. *A. heteronema*
- 66b. Pedicels subequal, 1–2 × as long as perianth.
- 67a. Bulb tunic reticulate; umbel laxly few flowered; pedicels 1.5–2 × as long as perianth; base of inner filaments with 1 short tooth on each side, apex of tooth entire 27. *A. henryi*
- 67b. Bulb tunic subreticulate; umbel densely many flowered; pedicels 1–1.5 × as long as perianth; base of inner filaments with 1 long tooth on each side, apex of tooth sometimes denticulate 31. *A. stenodon*
- 61b. Perianth white, pale red, purple-red, purple, dark purple, or yellow.
- 68a. Filaments more than 1.3 × as long as perianth segments.
- 69a. Perianth segments basally united for 1.5–2 mm into a short tube; filaments basally connate for 1.5–2 mm and adnate to perianth segments 43. *A. siphonanthum*
- 69b. Perianth segments free; filaments connate only at base.
- 70a. Bulb tunic usually red, distinctly reticulate; inner filaments broadened for 1/3–1/2 their length; ovary without concave nectaries at base 48. *A. przewalskianum*
- 70b. Bulb tunic never red, reticulate or fibrous; inner filaments broadened for ca. 1/3 their length; ovary with concave nectaries at base.
- 71a. Perianth pale red or purple-red to purple.
- 72a. Bulb tunic fibrous, sometimes subreticulate; pedicels ebracteolate 30. *A. plurifoliatum*
- 72b. Bulb tunic reticulate; pedicels bracteolate at base.
- 73a. Leaves semiterete 42. *A. clathratum*
- 73b. Leaves flat.
- 74a. Inner filaments entire 37. *A. schrenkii*
- 74b. Inner filaments with 1 or 2 teeth on each side.
- 75a. Perianth segments with red, slender midvein or without midvein; stigma punctiform 36. *A. lineare*
- 75b. Perianth segments with purple midvein; stigma capitate or subglobose.
- 76a. Perianth pale lilac to pinkish lilac 40. *A. splendens*
- 76b. Perianth pink to pink-red 41. *A. maackii*
- 71b. Perianth white to pale yellow.

- 77a. Leaves 2–7 mm wide, flat; teeth of inner filaments entire 44. *A. flavidum*
 77b. Leaves 1–5 mm wide, semiterete, fistulose; teeth of inner filaments sometimes irregularly
 2–4-denticulate.
 78a. Leaves equaling to distinctly longer than scape; pedicels ebracteolate 46. *A. flavovirens*
 78b. Leaves shorter than scape; pedicels bracteolate at base 45. *A. leucocephalum*
- 68b. Filaments less than 1.3 × as long as perianth segments.
 79a. Perianth yellow, later becoming red; filaments connate into tube for 3/5–4/5 their length 101. *A. semenovii*
 79b. Perianth not yellow; filaments connate only basally or for 1/6–1/2 their length.
 80a. Inner filaments toothed at base.
 81a. Filaments ca. 1/2 as long as perianth segments 18. *A. forrestii*
 81b. Filaments slightly shorter than or equaling perianth segments.
 82a. Leaves 3–5 mm wide, flat.
 83a. Filaments slightly longer than perianth segments; stigma punctiform 38. *A. amphibolum*
 83b. Filaments slightly shorter than or equaling perianth segments 39. *A. strictum*
 82b. Leaves 0.25–1 mm wide, semiterete.
 84a. Bulb tunic subreticulate; filaments connate into a tube for 1/6–1/2 their length, tube
 adnate to perianth segments for 1/3–1/2 its length.
 85a. Perianth segments 6–8.5 mm; filaments connate for 1/3–1/2 their length 54. *A. subangulatum*
 85b. Perianth segments 3–6 mm; filaments connate for 1/6–1/3 their length 55. *A. polyrhizum*
 84b. Bulb tunic distinctly reticulate; filaments connate only at base.
 86a. Pedicels bracteolate at base; perianth pale purple to purple; ovary without concave
 nectaries at base 47. *A. eduardii*
 86b. Pedicels ebracteolate; perianth pale red; ovary with concave nectaries at base covered
 by hoodlike projections 26. *A. aciphyllum*
- 80b. Inner filaments entire at base.
 87a. Scape covered with leaf sheaths for 1/4–1/2 its length.
 88a. Pedicels subequal; leaves 2–5 mm wide 39. *A. strictum*
 88b. Pedicels unequal; leaves 0.5–1 mm wide.
 89a. Bulb tunic distinctly reticulate 50. *A. tekesicola*
 89b. Bulb tunic subreticulate.
 90a. Bulb tunic brown; inner filaments basally ca. 2 × as wide as outer ones, distally abruptly
 subulate; ovary with concave nectaries at base covered by hoodlike projections 88. *A. korolkowii*
 90b. Bulb tunic yellowish brown; inner filaments basally ca. 3 × as wide as outer ones,
 distally gradually attenuate; ovary with small, concave nectaries at base not
 covered by hoodlike projections 49. *A. teretifolium*
- 87b. Scape covered with leaf sheaths only at base.
 91a. Bulb tunic reticulate or subreticulate; perianth white to pale red.
 92a. Inner filaments broadly triangular, basally ca. 2 × as wide as outer ones; perianth
 segments with dark purple midvein 34. *A. oreoprasum*
 92b. Inner filaments narrowly triangular, basally only slightly wider than outer ones;
 perianth segments without dark purple midvein.
 93a. Scape 5–15 cm; stigma slightly 3-cleft 35. *A. humile*
 93b. Scape 25–60 cm; stigma punctiform.
 94a. Leaves flat, solid; perianth segments white, usually with green midvein 32. *A. tuberosum*
 94b. Leaves triangular, abaxially keeled, fistulose; perianth segments white, rarely pale
 red, usually with pale red midvein 33. *A. ramosum*
- 91b. Bulb tunic fibrous or subreticulate at base; perianth dark purple, purple-red, or pale red.
 95a. Inner filaments not broadened at base.
 96a. Leaves 8–10 mm wide 21. *A. rhynchogynum*
 96b. Leaves 1–3 mm wide.
 97a. Filaments 1/2–2/3 as long as perianth segments; ovary constricted at apex, without
 concave nectaries at base 17. *A. mairei*
 97b. Filaments slightly shorter or longer than perianth segments; ovary not constricted
 at apex, with concave nectaries at base covered by narrow, hoodlike projections 20. *A. changduense*
- 95b. Inner filaments broadened at base.
 98a. Leaves 1.5–3(–5) mm wide, flat; perianth purple to dark purple 18. *A. forrestii*
 98b. Leaves 0.3–1.5 mm wide, semiterete to terete; perianth pale red to purple-red.
 99a. Leaves distinctly longer than scape; umbel laxly few flowered; perianth segments
 3–3.5 mm; ovary with concave nectaries at base 92. *A. alabasicum*

- 99b. Leaves shorter than scape; umbel densely many flowered; perianth segments 6–9 mm; ovary without concave nectaries at base 51. *A. mongolicum*
- 60b. Bulb tunic entire, never reticulate or only apical part becoming fibrous.
- 100a. Filaments shorter than perianth segments, never more than 4/5 as long as perianth segments.
- 101a. Perianth blue.
- 102a. Perianth segments narrowly oblong to narrowly ovate-oblong, 11–14(–17) mm, margin entire; filaments usually ca. 4/5 as long as perianth segments; style usually 2–3 × as long as ovary 22. *A. beesianum*
- 102b. Perianth segments ovate or ovate-oblong, 6–10 mm, margin of at least inner ones irregularly denticulate; filaments usually 1/2–2/3 as long as perianth segments; style usually shorter than or subequaling ovary.
- 103a. Perianth segments acuminate at apex, equal, irregularly denticulate at margin, rarely outer ones entire; leaves abaxially keeled, usually twisted when dry 23. *A. yuenum*
- 103b. Perianth segments obtuse at apex, inner ones longer and wider than outer, only inner ones irregularly denticulate at margin; leaves flat 24. *A. sikkimense*
- 101b. Perianth white, pale red, purple-red, pale purple, purple, yellow, or bright yellow.
- 104a. Perianth pale or bright yellow.
- 105a. Bulb cylindrical; leaves slightly falcate, usually ca. 1/2 as long as or rarely subequaling scape, flat 79. *A. chrysocephalum*
- 105b. Bulb ovoid-globose to ovoid; leaves subequaling scape, semiterete 80. *A. herderianum*
- 104b. Perianth white, pale red, purple-red, pale purple, or purple.
- 106a. Filaments connate into an urceolate tube for 3/4–4/5 their length 61. *A. weschniakowii*
- 106b. Filaments connate only at base or for 1/3–1/2 their length.
- 107a. Bulb tunic leathery; pedicels bracteolate at base; ovary with concave nectaries at base covered by hoodlike projections.
- 108a. Bulb tunic brown, apex becoming fibrous and somewhat subreticulate; pedicels unequal, 2–3 × as long as perianth in fruit 88. *A. korolkowii*
- 108b. Bulb tunic light yellowish brown, apex lacinate; pedicels subequal, 1–2 × as long as perianth in fruit 89. *A. setifolium*
- 107b. Bulb tunic membranous, papery, or thinly leathery; pedicels ebracteolate; ovary usually without concave nectaries at base (but present in *A. pevtzovii*).
- 109a. Perianth segments 2.8–5 mm, apex of inner ones truncate or rounded-truncate.
- 110a. Pedicels unequal, 1.5–3.5 cm; perianth segments 3.9–5 mm 60. *A. anisopodium*
- 110b. Pedicels subequal, 0.5–1.5 cm; perianth segments 2.8–4.2 mm.
- 111a. Bulb tunic lacinate; umbel hemispheric to globose, densely many flowered 59. *A. elegantulum*
- 111b. Bulb tunic splitting at apex; umbel hemispheric to fascicled, laxly flowered 58. *A. tenuissimum*
- 109b. Perianth segments 6–18 mm, apex of inner ones obtuse or acuminate.
- 112a. Inner filaments ovate at base, 1-toothed on each side; ovary with concave nectaries at base 87. *A. pevtzovii*
- 112b. Inner filaments subulate to narrowly ovate at base, entire; ovary without concave nectaries at base.
- 113a. Leaves 1.5–4 mm wide, flat; perianth segments 13–18 mm; filaments ca. 1/2 as long as perianth segments, all subulate 19. *A. kingdonii*
- 113b. Leaves 0.5–1 mm wide, semiterete; perianth segments 6–9 mm; filaments 2/3–3/4 as long as perianth segments, inner ones wider than outer.
- 114a. Bulbs densely clustered; bulb tunic papery, apex becoming fibrous; pedicels ca. 2 × as long as perianth; perianth segments ovate-oblong, 7–9 × 2.5–3 mm; broadened base of inner filaments narrowly triangular 53. *A. yongdengense*
- 114b. Bulbs laxly clustered; bulb tunic membranous, lacinate; pedicels 1–1.5 × as long as perianth; perianth segments elliptic to ovate, 6–7 × 3–4 mm; broadened base of inner filaments narrowly ovate 52. *A. caespitosum*
- 100b. Filaments slightly shorter to longer than perianth segments.
- 115a. Leaves flat or keeled abaxially.
- 116a. Bulbs attached to a stout, horizontal or oblique rhizome; scape usually 2-angled.
- 117a. Leaves abaxially keeled; ovary with concave nectaries at base covered by hoodlike projections 65. *A. taishanense*
- 117b. Leaves flat; ovary without concave nectaries at base.
- 118a. Perianth white to yellow; pedicels ebracteolate 66. *A. chiwui*
- 118b. Perianth pale red or pale purple to purple-red; pedicels bracteolate at base.
- 119a. Leaves straight or spirally tortuous, (1.5–)2–6 mm wide.
- 120a. Leaves straight, 1.5–4 mm wide 67. *A. spurium*

- 120b. Leaves spirally tortuous, 4–6 mm wide 68. *A. spirale*
- 119b. Leaves straight or slightly falcate, 6–15 mm wide.
- 121a. Inner filaments entire at base 69. *A. senescens*
- 121b. Inner filaments 1-toothed on each side at base 70. *A. nutans*
- 116b. Bulbs attached to a vertical rhizome; scape terete.
- 122a. Perianth yellowish green to pale yellow.
- 123a. Scape covered with leaf sheaths for ca. 1/2 its length; pedicels 2–4 × as long as perianth, bracteolate at base 71. *A. obliquum*
- 123b. Scape covered with leaf sheaths at base only; pedicels 1–1.5 × as long as perianth, ebracteolate.
- 124a. Inner filaments entire at base; umbel globose, densely many flowered; leaves 3–8 mm wide 78. *A. rude*
- 124b. Inner filaments 1-toothed on each side at base; umbel laxly flowered; leaves 2–3 mm wide 64. *A. brevidentatum*
- 122b. Perianth white, pale red, purple-red, purple, or blue.
- 125a. Inner filaments with 1 irregularly denticulate tooth on each side at base; ovary with concave nectaries at base covered by hoodlike projections.
- 126a. Leaves broadly linear to linear-lanceolate, 5–23 mm wide; spathe with a long beak sometimes to 7 cm; perianth white 29. *A. paepalanthoides*
- 126b. Leaves linear, 2–6(–8) mm wide; spathe with a short beak; perianth pale red, pale purple, or purple 30. *A. plurifoliatum*
- 125b. Inner filaments entire at base or, if toothed, teeth never denticulate; ovary with concave nectaries at base not covered by hoodlike projections.
- 127a. Spathe with long beak 82. *A. kurssanovii*
- 127b. Spathe with short beak.
- 128a. Bulb tunic blackish gray to black, papery or membranous.
- 129a. Leaves falcate; perianth white; ovary without concave nectaries at base 76. *A. phariense*
- 129b. Leaves straight; perianth pink or pinkish lilac; ovary with concave nectaries at base 77. *A. platyspathum*
- 128b. Bulb tunic red-brown or brown to yellowish brown, leathery or thinly so.
- 130a. Leaves 1–1.5(–3) mm wide, margin scabrous-denticulate; ovary without concave nectaries at base 73. *A. kaschianum*
- 130b. Leaves 2–17 mm wide, margin smooth; ovary with concave nectaries at base.
- 131a. Bulb tunic red-brown, lustrous 72. *A. hymenorhizum*
- 131b. Bulb tunic brown to yellowish brown, dull.
- 132a. Leaves usually falcate; inner filaments broadened at base 74. *A. carolinianum*
- 132b. Leaves usually not falcate; inner filaments not broadened at base 75. *A. blandum*
- 115b. Leaves semiterete or terete, solid or fistulose, adaxially channeled.
- 133a. Inner filaments obtusely 1-toothed on each side at base.
- 134a. Perianth white or pale yellow; style conspicuously exerted; ovary with concave nectaries at base 46. *A. flavovirens*
- 134b. Perianth red, pale purple-red, or purple-red; style not exerted; ovary without concave nectaries at base.
- 135a. Inner filaments broadened for ca. 4/5 their length 56. *A. bidentatum*
- 135b. Inner filaments broadened for ca. 1/2 their length 57. *A. dentigerum*
- 133b. Inner filaments entire at base.
- 136a. Beak of spathe several times as long as limb.
- 137a. Perianth segments pale yellow with green midvein 84. *A. petraeum*
- 137b. Perianth segments purple-red to pale red, rarely white, with dark midvein 81. *A. saxatile*
- 136b. Beak of spathe shorter than or equaling limb.
- 138a. Perianth white, pale yellow, or greenish yellow.
- 139a. Leaves solid, margin ciliate-denticulate 85. *A. tianschanicum*
- 139b. Leaves fistulose, margin smooth.
- 140a. Bulb tunic red-brown, lustrous; scape solid; pedicels bracteolate at base 93. *A. condensatum*
- 140b. Bulb tunic light brown to brown, dull; scape fistulose; pedicels ebracteolate 94. *A. xichuanense*
- 138b. Perianth pale red, red, pale purple, or purple.
- 141a. Pedicels bracteolate at base.
- 142a. Ovary with longitudinally convex nectaries along septa; nectary pit at ovary base open 90. *A. subtilissimum*
- 142b. Ovary without nectaries or only with concave nectaries at base.
- 143a. Bulbs attached to a robust, horizontal rhizome; filaments equaling or slightly longer

- than perianth segments; ovary without concave nectaries 62. *A. prostratum*
- 143b. Bulbs attached to vertical rhizome; filaments 1.25–2 × as long as perianth segments; ovary with concave nectaries.
- 144a. Bulb tunic red-brown, lustrous, scarious to subleathery; leaves 2–3 mm wide, margin smooth 91. *A. longistylum*
- 144b. Bulb tunic brown, dull, leathery; leaves 0.5–2 mm wide, margin ciliate- or scabrous-denticulate.
- 145a. Bulb tunic leathery, entire or lacinate at apex; ovary with concave nectaries covered by hoodlike projections 83. *A. caricoides*
- 145b. Bulb tunic thinly leathery to papery, splitting; ovary with concave nectaries not covered by hoodlike projections.
- 146a. Bulbs to 10 cm; tunic yellowish brown; filaments ca. 1/2 as long as perianth segments 86. *A. megalobulbon*
- 146b. Bulbs shorter; tunic brown; filaments 1.25–1.5 × as long as perianth segments 85. *A. tianschanicum*
- 141b. Pedicels ebracteolate.
- 147a. Inner filaments conspicuously broadly ovate or ovate-oblong at base.
- 148a. Bulb tunic grayish white, sometimes reddish; pedicels 2–3 × as long as perianth; perianth purple-red; style slightly longer than ovary 57. *A. dentigerum*
- 148b. Bulb tunic brown; pedicels shorter than or equaling perianth; perianth pale red; style shorter than ovary 56. *A. bidentatum*
- 147b. Inner filaments subulate to narrowly triangular at base, gradually attenuate toward apex.
- 149a. Scape covered with leaf sheaths for 1/3–1/2 its length; leaves 1 or 2, margin smooth; perianth pink 104. *A. oliganthum*
- 149b. Scape covered with leaf sheaths only at base; leaves more than 3, margin scabrid; perianth pale purple or red-purple.
- 150a. Inner perianth segments irregularly denticulate at distal margin and apex; style exerted 62. *A. prostratum*
- 150b. Inner perianth segments entire; style not exerted 63. *A. rubens*

1. *Allium victorialis* Linnaeus, Sp. Pl. 1: 295. 1753.

葱 ge cong

Allium latissimum Prokhanov; *A. microdictyum* Prokhanov; *A. ochotense* Prokhanov; *A. victorialis* subsp. *platyphyllum* Hultén; *A. wenchuanense* Z. Y. Zhu.

Bulb solitary or clustered, subcylindric; tunic grayish brown to blackish brown, reticulate. Leaves 2 or 3; petiole 2–10 cm; leaf blade oblanceolate-elliptic to elliptic, 8–12 × 3–9.5 cm, base cuneate to broadly so, gradually narrowed into petiole, decurrent, apex acute or acuminate. Scape 25–80 cm, terete, covered with leaf sheaths for 1/4–1/2 its length. Spathe 2-valved, persistent. Umbel globose. Pedicels 2–4 × as long as perianth, ebracteolate. Perianth white or slightly tinged with green, very rarely tinged with red; outer segments boat-shaped, 4–5 × 1.5–2 mm, apex obtuse; inner ones elliptic-ovate, (4.5–)5–6 × 2–3 mm, apex obtuse, usually denticulate. Filaments 1.3–2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones narrowly triangular, wider, 1–1.5 mm wide at base. Ovary constricted at base into a stipe ca. 1 mm; ovules 1 per locule. Fl. and fr. Jun–Aug. $2n = 16, 32^*$.

Forests, shady and moist slopes, pastures, streamsides; 600–2500 m. Anhui, E Gansu, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, Sichuan, Zhejiang [India, Japan, Kazakstan, Korea, Mongolia, Russia; Europe, NW North America].

2. *Allium listera* Stearn, Bull. Fan Mem. Inst. Biol. 5: 326.

1934.

对叶山葱 dui ye shan cong

Allium victorialis Linnaeus var. *listera* (Stearn) J. M. Xu.

Bulb solitary or clustered, subcylindric; tunic grayish brown to blackish brown, reticulate. Leaves 2; petiole 2–10 cm; leaf blade elliptic to ovate-orbicular, 8–12 × 3–9.5 cm, base cordate to rounded, apex acute or acuminate. Scape 25–80 cm, terete, covered with leaf sheaths for 1/4–1/2 its length. Spathe 2-valved, persistent. Umbel globose. Pedicels 2–4 × as long as perianth, ebracteolate. Perianth white or slightly tinged with green, very rarely tinged with red; outer segments boat-shaped, 4–5 × 1.5–2 mm, apex obtuse; inner ones elliptic-ovate, (4.5–)5–6 × 2–3 mm, apex obtuse, usually denticulate. Filaments 1.3–2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones narrowly triangular, 1–1.5 mm wide at base, wider than outer ones. Ovary constricted at base into a stipe ca. 1 mm; ovules 1 per locule. Fl. and fr. Jun–Aug. $2n = 16^*$.

• Forests, shady and moist slopes, pastures; 600–2000 m. Anhui, Hebei, Henan, Jilin, Shaanxi, Shanxi.

3. *Allium ovalifolium* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 60: 101. 1924.

卵叶山葱 luan ye shan cong

Bulb solitary or clustered, subcylindric; tunic grayish brown to blackish brown, reticulate. Leaves 2(or 3), subop-

posite; petiole 1–12 cm; leaf blade lanceolate- to ovate-oblong, (6–)8–15 × (2–)3–7 cm, main veins green or white, base deeply cordate to rounded, apex shortly caudate or acuminate. Scape 30–60 cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent or deciduous. Umbel globose, densely many flowered. Pedicels subequal, 1.5–4 × as long as perianth, elongate in fruit, ebracteolate. Perianth white, rarely pale red; outer segments narrowly ovate to ovate or ovate-oblong, 3.5–5 × 1.4–2 mm, apex retuse or obtuse, sometimes denticulate; inner ones lanceolate-oblong to narrowly oblong, (3.5–)4–6 × 1–1.6 mm, apex retuse, obtuse, or acuminate, sometimes irregularly denticulate at least at distal margin. Filaments equal, 1–1.5 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones narrowly triangular, 0.8–1.1 mm wide at base. Ovary constricted at base into a stipe ca. 0.5 mm; ovules 1 per locule. Fl. and fr. Jul–Sep.

• Forests, forest margins, thickets, damp places, stream banks, rock crevices; 1500–4000 m. SE Gansu, NE Guizhou, W Hubei, E Qinghai, S Shaanxi, Sichuan, NW Yunnan.

- 1a. Leaf blade with white main veins 3b. var. *leuconeurum*
- 1b. Leaf blade without white main veins.
 - 2a. Leaf blade base cordate to rounded, rarely deeply cordate; inner perianth segments narrower than outer ones, apex retuse or obtuse, sometimes irregularly denticulate 3a. var. *ovalifolium*
 - 2b. Leaf blade base deeply cordate; inner perianth segments as wide as or slightly wider than outer ones, apex acuminate, sometimes distal margin distantly denticulate 3c. var. *cordifolium*

3a. Allium ovalifolium var. *ovalifolium*

卵叶山葱(原变种) luan ye shan cong (yuan bian zhong)

Allium prattii C. H. Wright var. *latifoliatum* F. T. Wang & Tang.

Leaf blade without white main veins, base cordate to rounded, rarely deeply cordate. Inner perianth segments narrower than outer ones, apex retuse or obtuse, sometimes irregularly denticulate. Fl. and fr. Jul–Sep. $2n = 16^*$, 24^* .

• Forests, forest margins, thickets, damp places, stream banks, rock crevices; 1500–4000 m. SE Gansu, NE Guizhou, W Hubei, E Qinghai, S Shaanxi, Sichuan, NW Yunnan.

3b. Allium ovalifolium var. *leuconeurum* J. M. Xu in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 283. 1980.

白脉山葱 bai mai shan cong

Leaf blade with white main veins. Perianth segments similar.

• Forests; 2800–3800 m. W Sichuan.

3c. Allium ovalifolium var. *cordifolium* (J. M. Xu) J. M. Xu, Fl. Sichuan. 7: 140. 1991.

心叶山葱 xin ye shan cong

Allium cordifolium J. M. Xu in F. T. Wang & Tang, Fl.

Reipubl. Popularis Sin. 14: 284. 1980.

Leaf blade without white main veins, base deeply cordate. Inner perianth segments as wide as or slightly wider than outer ones, apex acuminate, sometimes distal margin distantly denticulate.

• Forests; 3000–3800 m. W Sichuan.

4. Allium funckiifolium Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 57: 175. 1920.

玉簪叶山葱 yu zan ye shan cong

Bulb solitary, subcylindric; tunic grayish brown, reticulate. Leaf 1; petiole 8.5–15 cm; leaf blade ovate to broadly ovate-elliptic, 16–22.8 × 7–15.7 cm, base cordate to deeply so, usually crisped, apex acute or acuminate. Scape 35–65 cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel globose. Pedicels subequal, 2–4 × as long as perianth, ebracteolate. Perianth white; segments subequal, elliptic to narrowly so, 3–4.5 × 1.2–1.5 mm; outer ones boat-shaped. Filaments 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones narrowly triangular, wider, ca. 1 mm wide at base. Ovary constricted at base into a stipe ca. 1 mm; ovules 1 per locule. Fl. Jul. $2n = 16^*$.

• Forests, shady and moist slopes, streamsides; 2200–2300 m. W Hubei, E Sichuan.

5. Allium nanodes Airy Shaw, Notes Roy. Bot. Gard. Edinburgh 16: 141. 1931.

短葶山葱 duan ting shan cong

Bulb solitary or clustered, subcylindric; tunic grayish brown, reticulate. Leaves 2, opposite; leaf blade tinged with purple, oblong to narrowly oblong, curved backward, 3.5–9 × 1.5–3 cm, base gradually narrowed into a very short petiole, apex acute. Scape 2–5 cm, terete, covered with leaf sheaths for 3/4–4/5 its length. Spathe 2-valved, persistent or deciduous. Umbel laxly flowered. Pedicels subequal, ca. 2 × as long as perianth, ebracteolate. Perianth white, tinged with red; outer segments boat-shaped, 5–8 × 1.5–2 mm, apex acute; inner ones narrowly oblong to narrowly ovate, 5.5–9 × 1–1.8 mm. Filaments slightly longer than perianth segments, connate at base for ca. 1 mm and adnate to perianth segments; outer ones 0.7–1 mm wide; inner ones 1–1.8 mm wide at base. Ovary constricted at base into an obscure stipe; ovules 1 per locule. Fl. and fr. Jun–Aug. $2n = 16^*$.

• Scrub or meadows in high mountains, gravelly slopes; 3300–5200 m. SW Sichuan, NW Yunnan.

6. Allium prattii C. H. Wright ex Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 36: 124. 1903.

太白山葱 tai bai shan cong

Allium cannifolium H. Léveillé; *A. prattii* var. *ellipticum* F. T. Wang & Tang; *A. prattii* var. *vinicolor* F. T. Wang & Tang; *A. victoralis* Linnaeus var. *angustifolium* J. D. Hooker.

Bulb solitary or clustered, subcylindric; tunic grayish brown to blackish brown, reticulate. Leaves 2, subopposite,

rarely 3, linear, linear-lanceolate, elliptic-lanceolate, elliptic-ob-lanceolate or rarely narrowly elliptic, shorter than to sub-equaling scape, 0.5–4(–7) cm wide, base gradually narrowed into an obscure petiole, apex acuminate. Scape 10–60 cm, terete, covered with leaf sheaths only at base. Spathe 1- or 2-valved, persistent. Umbel hemispheric. Pedicels subequal, 2–4 × as long as perianth, ebracteolate. Perianth purple-red to pale red, rarely approaching white; outer segments narrowly ovate, ob-long-ovate, to oblong, 3.2–5.5 × 1.4–2(–2.9) mm, apex obtuse, retuse, or denticulate; inner ones lanceolate-oblong to narrowly oblong, 4–7 × 1–1.5(–2.5) mm. Filaments slightly longer than to 1.5 × as long as perianth segments, connate at base and ad-nate to perianth segments; outer ones subulate; inner ones nar-rowly triangular, 0.8–1.5 mm wide at base. Ovary constricted at base into a short stipe; ovules 1 per locule. Fl. And fr. end of Jun–Sep. 2n = 16*, 32*.

Shady and damp forests, thickets, scrub, stream banks, slopes, meadows; 2000–4900 m. Anhui, Gansu, Henan, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, India, Nepal, Sikkim].

7. Allium guanxianense J. M. Xu, Acta Phytotax. Sin. 31: 376. 1993.

灌县韭 guan xian jiu

Roots thick, fleshy. Bulbs clustered, cylindric, 0.6–1 cm in diam., with short stolons; tunic fibrous. Leaves linear-ob-lanceolate, shorter than scape, 2–3 cm wide, midvein distinct, base long attenuate, apex obtuse to acuminate. Scape terminal, 40–60 cm, terete, covered with leaf sheaths for ca. 1/4 its length. Spathe deciduous. Umbel globose, laxly flowered. Ped-icels equal, 2–3 × as long as perianth, ebracteolate. Perianth white; segments lanceolate to ovate-lanceolate, 8–9 × ca. 2 mm, apex obtuse. Filaments subulate, slightly shorter than perianth segments, connate at base for ca. 1 mm and adnate to perianth segments. Ovary obovoid, base without concave nectaries, con-stricted into a stipe ca. 1 mm; ovules 1 per locule. Style sub-equaling ovary; stigma punctiform. Fl. Aug.

• Damp slopes; 1800–2000 m. C Sichuan (Dayi Xian, Guan Xian).

8. Allium xiangchengense J. M. Xu, Acta Phytotax. Sin. 31: 374. 1993.

乡城韭 xiang cheng jiu

Roots thick, fleshy. Bulbs clustered, cylindric, 0.3–0.4 cm in diam.; tunic white, membranous, entire, with some fibers. Leaves lanceolate to linear-lanceolate, shorter than scape, 1.5–2 cm wide, midvein distinct, base conspicuously attenuate, apex acuminate. Scape lateral, 23–26 cm, terete, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbel glo-bose, laxly flowered. Pedicels equal, 2–3 × as long as perianth, ebracteolate. Perianth white; segments lanceolate, 4.5–5 × ca. 1 mm, apex acuminate, sometimes 2-lobed. Filaments subulate, slightly longer than perianth segments, connate at base and ad-nate to perianth segments. Ovary subglobose, base without con-cave nectaries, constricted into a stipe ca. 0.5 mm; ovules 1 per locule. Style longer than ovary; stigma punctiform. Fl. Aug.

• Forest margins, shady and damp places; ca. 3300 m. W Sichuan (Xiangcheng Xian).

9. Allium hookeri Thwaites, Enum. Pl. Zeyl. 339. 1864.

宽叶韭 kuan ye jiu

Roots elongate, thick, fleshy. Bulbs clustered, cylindric; tunic membranous, entire. Leaves linear to broadly so, shorter than to subequaling scape, 0.5–1 cm wide, midvein distinct. Scape lateral, usually arising from base of bulb, (10–)20–60 cm, usually without leaf sheaths, sometimes with 1. Spathe 2-valved, usually deciduous. Umbel hemispheric to globose, many flowered. Pedicels subequal, 2–3(–4) × as long as perianth, ebracteolate. Perianth white or greenish yellow to yellow; seg-ments similar, lanceolate, 4–7.5 × 1–1.5 mm, apex acuminate, sometimes unequally 2-lobed. Filaments subulate, slightly shorter than to subequaling perianth segments, connate at base and adnate to perianth segments. Ovary obovoid, smooth, base constricted into a short stipe; ovules 1 per locule. Style longer than ovary; stigma punctiform. Fl. and fr. Jul–Oct. 2n = 22*, 44*.

Forests, forest margins, moist places, meadows; 1400–4200 m. SW Sichuan, SE Xizang, NW Yunnan [Bhutan, India, Myanmar, Sri Lanka].

- 1a. Perianth white 9a. var. *hookeri*
- 1b. Perianth greenish yellow to yellow 9b. var. *muliense*

9a. Allium hookeri var. *hookeri*

宽叶韭(原变种) kuan ye jiu (yuan bian zhong)

Allium tsoongii F. T. Wang & Tang.

Perianth white.

Forests, moist places; 1400–4000 m. SW Sichuan, SE Xizang, NW Yunnan [Bhutan, India, Myanmar, Sri Lanka].

Cultivated as a vegetable in some parts of S China.

9b. Allium hookeri var. *muliense* Airy Shaw, Notes Roy. Bot. Gard. Edinburgh 16: 139. 1931.

木里韭 mu li jiu

Perianth greenish yellow to yellow.

• Forest margins, meadows, moist places; 2800–4200 m. SW Sichuan, NW Yunnan.

10. Allium omeiense Z. Y. Zhu, Bull. Bot. Res., Harbin 9(4): 65. 1989.

峨眉韭 e mei jiu

Roots elongate, thick, fleshy. Bulbs clustered, cylindric, robust, 1.5–2 cm in diam.; tunic fibrous. Leaves band-shaped to linear-ob-lanceolate, longer than scape, (1.5–)2–3.5 cm wide, midvein distinct. Scape lateral, 30–65 cm, terete, sometimes slightly compressed, covered with leaf sheaths for ca. 1/3 its length, reflexed after anthesis. Spathe deciduous. Umbel hemi-spheric, usually with leafing bulblets. Pedicels subequal, slight-ly longer than to 2 × as long as perianth, ebracteolate. Perianth white; segments linear to linear-lanceolate, 9–11 × 0.5–1.1 mm, apex caudate; inner ones slightly shorter than outer, united into a tube ca. 1 mm, midvein pale green. Filaments subulate, equal, ca. 1/2 as long as perianth segments, connate at base and adnate to perianth segments. Ovary subglobose, smooth; ovules 1(or 2)

per locule. Style longer than ovary; stigma punctiform. Fl. and fr. Aug–Oct. $2n = 22^*$.

• Stream banks, slopes; 1000–1200 m. C Sichuan (Emei Shan, Hongya Xian).

Cultivated as vegetable on Emei Shan.

11. *Allium chienchuanense* J. M. Xu in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 284. 1980.

劍川韭 *jian chuan jiu*

Roots elongate, thick, fleshy. Bulb solitary or clustered, cylindrical, robust, 2–3 cm in diam.; tunic fibrous. Leaves band-shaped, shorter than scape, 1.5–3(–5) cm wide, midvein distinct. Scape lateral, 75–80 cm, terete, covered with leaf sheaths for ca. 1/3 its length. Spathe deciduous. Umbel subglobose. Pedicels subequal, 2–3 × as long as perianth, ebracteolate. Perianth yellow; segments all similar, oblong to oblong elliptic, 6–7 × 2–2.2 mm, basally united into a tube ca. 1 mm, apex irregularly denticulate, rarely entire. Filaments subulate, equal, slightly longer than perianth segments, connate at base for ca. 1.5 mm and adnate to perianth segments. Ovary obovoid, smooth, base constricted into a short stipe; ovules 2 per locule. Style longer than ovary; stigma punctiform. Fl. Sep.

• Streamsides, moist places; ca. 3100 m. Yunnan (Jianchuan Xian).

12. *Allium fasciculatum* Rendle, J. Bot. 44: 42. 1906.

粗根韭 *cu gen jiu*

Allium gageanum W. W. Smith.

Roots tuberous, short, thick. Bulb solitary or clustered, cylindrical; tunic pale brown, fibrous. Leaves linear, usually longer than scape, 2–5 mm wide, midvein obscure. Scape lateral, (5–)15–40 cm, terete, covered with leaf sheaths for 1/4–2/5 its length. Spathe 1- or 2-valved, persistent or deciduous. Umbel globose. Pedicels subequal, 1.5–2 × as long as perianth, ebracteolate. Perianth white; segments lanceolate, 4.5–6 × 1.4–2.2 mm, base usually broadened, rounded, apex acuminate or irregularly 2-lobed. Filaments subulate, slightly shorter than perianth segments, connate at base and adnate to perianth segments. Ovary applanate-globose, minutely tuberculate, base constricted into a short stipe; ovules 2 per locule. Style equaling to slightly longer than ovary; stigma punctiform. Fl. and fr. Jul–Sep.

Dry slopes, meadows, sandy places; 2200–5400 m. SE Qinghai, W Sichuan, SE Xizang [Bhutan, Nepal, Sikkim].

13. *Allium wallichii* Kunth, Enum. Pl. 4: 443. 1843.

多星韭 *duo xing jiu*

Roots elongate, thick. Bulb solitary or clustered, cylindrical; tunic yellowish brown, lacinate or fibrous to subreticulate. Leaves linear to oblong-lanceolate or lanceolate, shorter than to subequaling scape, (2–)5–20 mm wide, midvein distinct, base narrowed into a petiole or not. Scape lateral, (10–)20–50(–110) cm, 3-angled, sometimes narrowly 3-winged, covered with leaf sheaths only at base or for ca. 1/2 its length. Spathe 1- or 2-valved, deciduous. Umbel hemispheric, laxly or densely flow-

ered. Pedicels subequal, 2–4 × as long as perianth, ebracteolate. Perianth stellately spreading, recurved after anthesis, pale red, red, or purple to blackish purple, rarely white; segments oblong-elliptic to narrowly so, 5–9 × 1.5–2 mm, apex retuse or obtuse. Filaments subulate, shorter than to subequaling perianth segments, connate at base and adnate to perianth segments. Ovary obovoid-globose, smooth; ovules 2 per locule. Style longer than ovary. Fl. and fr. Jul–Oct.

Forest margins, scrub, meadows, stream banks; 2300–4800 m. Guangxi, Guizhou, S Hunan, SW Sichuan, SE Xizang, NW Yunnan [Bhutan, India, Myanmar, Nepal, Sikkim].

- 1a. Leaves linear to broadly so, base not narrowed into a petiole; scape covered with leaf sheaths only at base 13a. var. *wallichii*
- 1b. Leaves oblong-lanceolate to lanceolate, base narrowed into a petiole; scape covered with leaf sheaths for ca. 1/2 its length 13b. var. *platyphyllum*

13a. *Allium wallichii* var. *wallichii*

多星韭(原变种) *duo xing jiu* (yuan bian zhong)

Allium bulleyanum Diels; *A. bulleyanum* var. *tchongchanense* (H. Léveillé) Airy Shaw; *A. feddei* H. Léveillé; *A. liangshanense* Z. Y. Zhu; *A. polyastrum* Diels; *A. praelatitium* H. Léveillé; *A. tchongchanense* H. Léveillé; *A. wallichii* var. *albidum* F. T. Wang & Tang; *Nothoscordum mairei* H. Léveillé.

Leaves linear to broadly so, base not narrowed into a petiole. Scape covered with leaf sheaths only at base. Fl. and fr. Jul–Oct. $2n = 14^*$, 28^* .

Forest margins, scrub, moist meadows, stream banks; 2300–4800 m. Guangxi, Guizhou, S Hunan (Mang Shan), SW Sichuan, SE Xizang, NW Yunnan [Bhutan, India, Myanmar, Nepal, Sikkim].

13b. *Allium wallichii* var. *platyphyllum* (Diels) J. M. Xu in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 211. 1980.

柳叶韭 *liu ye jiu*

Allium polyastrum Diels var. *platyphyllum* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 300. 1912; *A. lancifolium* Stearn; *A. polyastrum* var. *pallens* F. T. Wang & Tang.

Leaves oblong-lanceolate to lanceolate, base narrowed into a petiole. Scape covered with leaf sheaths for ca. 1/2 its length.

• Meadows, stream banks; 3100–3400 m. NW Yunnan.

14. *Allium macranthum* Baker, J. Bot. 12: 293. 1874.

大花韭 *da hua jiu*

Allium oviflorum Regel; *A. simethis* H. Léveillé & Giraudias.

Roots rather short, thick. Bulb solitary, cylindrical; tunic membranous, entire, rarely fibrous. Leaves subequaling scape, 4–10 mm wide, midvein distinct. Scape terminal, 20–60 cm, 2- or 3-angled, sometimes narrowly winged, covered with leaf sheaths only at base. Spathe 2- or 3-valved, deciduous. Umbel laxly few flowered. Pedicels subequal, 2–5 × as long as perianth, ebracteolate, apex nodding. Perianth spreading-cam-

panulate, red-purple to purple; outer segments oblong, boat-shaped, shorter and wider than inner ones, 9–11.5 × 5–8 mm, apex truncate or retuse; inner ones narrowly ovate-oblong, 10.2–12 × 4–6 mm. Filaments subulate, equal, equaling to slightly longer than perianth segments, connate at base and adnate to perianth segments. Ovary obovoid-globose, apex sometimes 6-horned; ovules 2 per locule. Style much longer than ovary, exerted; stigma punctiform. Fl. and fr. Aug–Oct. $2n = 14, 28$.

Meadows, stream banks, damp places; 2700–4200 m. SW Gansu, S Shaanxi, SW Sichuan, S Xizang (Yadong Xian), NW Yunnan [Bhutan, Sikkim].

15. *Allium cyathophorum* Bureau & Franchet, J. Bot. (Morot) 5: 154. 1891.

杯花韭 bei hua jiu

Roots rather long, thick. Bulb solitary or clustered, cylindrical; tunic grayish brown, fibrous, sometimes subreticulate. Leaves linear, usually shorter than scape, 2–5 mm wide, midvein distinct. Scape lateral, 13–15 cm, terete, usually 2-angled, covered with leaf sheaths only at base. Spathe 1(–3)-valved, persistent. Umbel hemispheric, laxly flowered. Pedicels 1–3 × as long as perianth, ebracteolate. Perianth purple to dark purple; segments elliptic-oblong, 7–9 × 3–4 mm, apex retuse to obtuse or acuminate; inner ones slightly longer than outer. Filaments ca. 2/3 as long as perianth segments, connate into a tube for 2/3–3/4 their length; outer ones narrowly triangular; inner ones broadened at base, shoulder-shaped or triangular. Ovary ovoid-globose, tuberculate; ovules 2 per locule. Style shorter than ovary; stigma 3-cleft. Fl. and fr. Jun–Aug.

• Slopes, meadows, rock crevices; 2700–4600 m. SE Gansu, S Qinghai, W Sichuan, E Xizang, NW Yunnan.

- 1a. Perianth segments retuse to obtuse at apex; inner filaments shoulder-shaped at base 15a. var. *cyathophorum*
- 1b. Perianth segments acuminate at apex; inner filaments triangular at base 15b. var. *farreri*

15a. *Allium cyathophorum* var. *cyathophorum*

杯花韭(原变种) bei hua jiu (yuan bian zhong)

Allium venustum C. H. Wright.

Perianth segments retuse to obtuse at apex. Inner filaments shoulder-shaped at base. $2n = 16^*$.

• Slopes, meadows, rock crevices; 3000–4600 m. S Qinghai (Yushu Xian), SW Sichuan, E Xizang, NW Yunnan.

15b. *Allium cyathophorum* var. *farreri* (Stearn) Stearn, Bot. Mag. 170: t. 252. 1955.

川甘韭 chuan gan jiu

Allium farreri Stearn, J. Bot. 64: 342. 1930.

Perianth segments acuminate at apex. Inner filaments triangular at base. $2n = 16^*$.

• Slopes, meadows; 2700–3600 m. SE Gansu, NW Sichuan.

16. *Allium trifurcatum* (F. T. Wang & Tang) J. M. Xu, Fl.

Sichuan. 7: 145. 1991.

三柱韭 san zhu jiu

Allium humile Kunth var. *trifurcatum* F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 284. 1980.

Roots elongate, relatively thick. Bulbs clustered, cylindrical, attached to horizontal rhizome; tunic grayish black, thinly leathery, lacinate or fibrous. Leaves broadly linear, shorter than scape, 4–10 mm wide, midvein distinct. Scape lateral, (14–)20–30 cm, terete, narrowly 2-winged, covered with leaf sheaths only at base. Spathe 2-valved, usually persistent. Umbel broom-like, laxly few flowered. Pedicels unequal, elongate at anthesis, 1.5–2 × as long as perianth, ebracteolate. Perianth white, spreading funneliform; segments narrowly oblong to oblong-lanceolate, rarely ovate, (4–)6–8 × 1.7–2 mm; inner ones slightly longer than outer. Filaments 1/3–1/2 as long as perianth segments, base broadly triangular, connate and adnate to perianth segments, apex attenuate, subulate; inner ones slightly shorter than outer. Ovary obovoid, smooth; ovules 1 per locule. Style much shorter than ovary, sometimes absent; stigma 3-cleft. Fl. and fr. end of May–Aug.

• Forests, scrub, damp slopes, stream banks; 3000–4000 m. SW Sichuan, NW Yunnan.

17. *Allium mairei* H. Léveillé, Repert. Spec. Nov. Regni Veg. 7: 339. 1909.

滇韭 dian jiu

Allium amabile Stapf; *A. giraudiasii* H. Léveillé; *A. mairei* H. Léveillé (loc. cit.: 384, not 339); *A. pyrrhorrhizum* Airy Shaw; *A. pyrrhorrhizum* var. *leucorrhizum* F. T. Wang & Tang; *A. yunnanense* Diels.

Bulbs usually clustered, cylindrical, slightly thickened at base; tunic yellowish brown to grayish brown, fibrous, sometimes slightly reticulate. Leaves shorter than to subequaling scape, 1–1.5(–2) mm wide, semiterete-flat to semiterete or subterete, finely angled, angles scabrous. Scape usually tinged with purple, 10–30(–40) cm, terete, 2-angled, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbels 2, each with a basal bract, or umbel 1 and ebracteate. Pedicels unequal, 1.5–2 × as long as perianth, rarely slightly longer, elongate in fruit, ebracteolate. Perianth pale red to purple-red; segments linear, narrowly oblong, oblanceolate-oblong, or elliptic-oblong, 8–12(–15) × 1.5–4 mm, apex obtuse or acute, sometimes conduplicate and reflexed; inner ones slightly narrower. Filaments subulate, equal, 1/2–2/3 as long as perianth segments, rarely shorter, connate at base and adnate to perianth segments for ca. 1 mm. Ovary constricted at both ends, without concave nectaries at base, apex rarely constricted into a beak. Style not exerted; stigma slightly 3-cleft. Fl. and fr. Aug–Oct. $2n = 16^*, 32^*$,

• Forests, slopes, meadows, rock crevices; 1200–4200 m. SW Sichuan, SE Xizang, Yunnan.

18. *Allium forrestii* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 302. 1912.

梭沙韭 suo sha jiu

Bulbs clustered, cylindrical, 0.4–0.7 cm in diam.; tunic grayish brown, fibrous, usually subreticulate at base, rarely lacinate. Leaves linear, shorter than scape, 1.5–3(–5) mm wide. Scape usually purple-red, 15–30 cm, terete, covered with leaf sheaths only at base. Spathe 1-valved, deciduous. Umbel few flowered. Pedicels subequal, shorter than to equaling perianth, ebracteolate. Perianth purple to dark purple; segments elliptic to ovate or obovate-elliptic, 8–13 × 4–4.5 mm, apex obtuse or attenuate into an obtuse point. Filaments equal, ca. 1/2 as long as perianth segments, connate at base and adnate to perianth segments for ca. 1 mm; outer ones subulate; inner ones usually broadened at base, rarely 1-toothed on each side. Ovary subglobose, with concave nectaries at base. Style shorter than to subequaling ovary; stigma usually 3-cleft. Fl. and fr. Aug–Oct. $2n = 16^*$.

• Meadows, gravelly slopes; 2700–4200 m. SW Sichuan, E Xizang, NW Yunnan.

19. *Allium kingdonii* Stearn, Bull. Brit. Mus. (Nat. Hist.), Bot. 2: 175. 1960.

钟花韭 zhong hua jiu

Bulb usually solitary, cylindrical, ca. 0.6 cm in diam.; tunic dull yellowish red, thinly leathery, lacinate. Leaves linear, shorter than scape, 1.5–4 mm wide, apex obtuse. Scape 10–30 cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent or deciduous. Umbel few flowered. Pedicels unequal, shorter to slightly longer than perianth, ebracteolate. Perianth purple-red; segments narrowly oblong, 13–18 × 3–4.2 mm, apex obtuse; inner ones slightly longer and narrower than outer. Filaments subulate, equal, ca. 1/2 as long as perianth segments, connate at base for ca. 1 mm; outer ones adnate to perianth segments for ca. 1 mm; inner ones adnate for ca. 2 mm. Ovary globose, without concave nectaries at base. Style longer than ovary; stigma slightly 3-cleft. Fl. and fr. Jun–Aug.

• Scrub, moist places; 4500–5000 m. SE Xizang.

20. *Allium changduense* J. M. Xu in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 285. 1980.

昌都韭 chang du jiu

Bulb solitary or clustered, cylindrical, 0.5–1 cm in diam.; tunic brown, subreticulate. Leaves linear, shorter than scape, 2–3 mm wide. Scape 15–20 cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel few flowered. Pedicels unequal, 0.2–2.5 cm, ebracteolate. Perianth purple-red; outer segments narrowly oblong, 6.5–14.5 × 2.5–4 mm, apex obtuse; inner ones 7.2–15.5 × 2–4.5 mm. Filaments subulate, subequal, slightly shorter to slightly longer than perianth segments, connate at base and adnate to perianth segments. Ovary ovoid, with concave nectaries covered by short, hoodlike projections at base. Style slightly longer than ovary; stigma punctiform. Fl. Aug–Sep.

• Scrub, slopes; 3200–4500 m. NW Sichuan (Dêgê Xian), E Xizang (Jomda Xian, Qamdo Xian).

21. *Allium rhynchogynum* Diels, Notes Roy. Bot. Gard. Edinburgh 5: 302. 1912.

宽叶滇韭 kuan ye dian jiu

Bulb probably solitary, narrowly cylindrical; tunic fibrous. Leaves broadly linear, shorter than scape, 8–10 mm wide, flat, apex rounded. Scape lateral, 16–22 cm, with 1 leaf sheath at base. Spathe thinly leathery, persistent. Umbel few flowered. Pedicels unequal, 1–2.5 cm, ebracteolate. Perianth pinkish red; segments narrowly lanceolate, 10–12 × 2.5–3 mm, apex acuminate. Filaments subulate, equal, ca. 1/2 as long as perianth segments, connate at base and adnate to perianth segments. Ovary constricted at base into a stipe, without concave nectaries at base. Style shorter than ovary, persistent; stigma globose. Fl. Aug.

• Cliffs, valleys; 2700–3200 m. NW Yunnan.

22. *Allium beesianum* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 8: 176. 1914.

蓝花韭 lan hua jiu

Bulbs clustered, cylindrical, 0.5–1 cm in diam.; tunic brown, fibrous, subreticulate at base, sometimes lacinate. Leaves linear, shorter than scape, 3–8 mm wide. Scape (20–)30–50 cm, terete, covered with leaf sheaths only at base. Spathe 1-valved, deciduous. Umbel hemispheric, laxly few flowered. Pedicels subequal, shorter than to equaling perianth, ebracteolate. Perianth blue; outer segments narrowly ovate-oblong, 11–14(–17) × 3–5.5 mm, margin entire, apex obtuse; inner ones slightly longer and narrower than outer. Filaments subequal, usually ca. 4/5 as long as perianth segments, connate at base and adnate to perianth segments for ca. 1 mm; outer ones subulate; inner ones broadened at base, sometimes 1-toothed on each side. Ovary obovoid-globose, with concave nectaries at base. Style 2–3 × as long as ovary; stigma punctiform. Fl. and fr. Aug–Oct.

• Slopes, meadows; 3000–4200 m. SW Sichuan (Yanbian Xian), NW Yunnan (Heqing Xian, Lijiang Naxi Zu Zizhixian).

23. *Allium yuanum* F. T. Wang & Tang, Bull. Fan Mem. Inst. Biol. 7: 295. 1937.

齿被韭 chi bei jiu

Bulb solitary or clustered, cylindrical, 0.2–0.4 cm in diam.; tunic brown, subreticulate. Leaves linear, usually twisted when dried, shorter or slightly longer than scape, 1.5–3 mm wide, abaxially keeled. Scape 17–55 cm, terete, covered with leaf sheaths only at base. Spathe (1 or)2(or 3)-valved, persistent. Umbel hemispheric, densely many flowered. Pedicels subequal, shorter to longer than perianth, ebracteolate. Perianth blue; segments ovate, 7.5–10 × 3–4 mm, margin irregularly denticulate or (on outer segments) entire, apex acuminate. Filaments subulate, ca. 1/2 as long as perianth segments, connate at base and adnate to perianth segments; inner ones sometimes broadened at base, entire. Ovary subglobose, with concave nectaries covered by hoodlike projections at base. Style equaling to slightly longer than ovary, not exerted; stigma slightly 3-cleft. Fl. and fr. Aug–Sep.

• Forest margins, meadows in forests, slopes; 2800–3500 m. NW Sichuan.

24. *Allium sikkimense* Baker, J. Bot. 12: 292. 1874.

高山韭 gao shan jiu

Allium cyaneum Regel var. *brachystemon* Regel; *A. kansuense* Regel; *A. tibeticum* Rendle.

Bulbs clustered, cylindrical, 0.3–0.5 cm in diam.; tunic dark brown, fibrous, subtreticulate at base, rarely lacinate. Leaves linear, shorter than scape, 2–5 mm wide, flat. Scape (5–)15–40 cm, terete, covered with leaf sheaths only at base. Spathe 1-valved, deciduous. Umbel hemispheric, densely many flowered. Pedicels subequal, shorter than to equaling perianth, ebracteolate. Perianth blue; segments ovate to ovate-oblong, 6–10 × 3–4.5 mm, apex obtuse; inner ones usually slightly longer and wider than outer, margin usually irregularly remotely denticulate. Filaments equal, 1/2–2/3 as long as perianth segments, connate and adnate to perianth segments for ca. 1 mm, usually all broadened at base, sometimes 1-toothed on each side. Ovary subglobose, with concave nectaries covered by short, hoodlike projections at base. Style shorter than to subequaling ovary, not exserted; stigma punctiform. Fl. and fr. Jul–Sep. $2n = 32, 48^*$.

Forest margins, scrub, slopes, meadows; 2400–5000 m. S Gansu, S Ningxia, E and S Qinghai, SW Shaanxi, W Sichuan, SE Xizang, NW Yunnan [Bhutan, India, Nepal, Sikkim].

25. *Allium cyaneum* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 3(2): 174. 1875.

天蓝韭 tian lan jiu

Allium hugonianum Rendle; *A. szechuanicum* F. T. Wang & Tang; *A. tui* F. T. Wang & Tang.

Bulbs clustered, cylindrical, 0.2–0.4(–0.6) cm in diam.; tunic dark brown, usually not distinctly reticulate. Leaves shorter or longer than scape, 1.5–2.5 mm wide, semiterete, adaxially channeled. Scape 10–30(–45) cm, terete, covered with leaf sheaths only at base. Spathe 1- or 2-valved, deciduous. Umbel subfascicled, sometimes hemispheric. Pedicels subequal, 1–2 × as long as perianth, ebracteolate. Perianth blue; segments ovate to oblong-ovate, 4–6.5 × 2–3 mm; inner ones slightly longer than outer. Filaments equal, 1.3–2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, base sometimes 1-toothed on each side. Ovary subglobose, with concave nectaries covered by short, hoodlike projections at base. Style exserted. Fl. and fr. Aug–Oct. $2n = 32^*$.

Forest margins, slopes, meadows; 2100–5000 m. Gansu, W Hubei, Ningxia, Qinghai, Shaanxi, Sichuan, Xizang [Korea].

Allium cyaneum var. *deltoides* S. O. Yu et al. (J. Korean Pl. Taxon. 11(1–2): 29. 1981) was described from Korea, but no material has been seen by the present authors.

26. *Allium aciphyllum* J. M. Xu in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 284. 1980.

针叶韭 zhen ye jiu

Bulbs clustered, cylindrical, thickened at base, 0.8–1 cm in diam.; tunic dark brown, reticulate. Leaves subequaling scape, ca. 1 mm wide, adaxially channeled. Scape 15–25 cm, terete, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbel few flowered. Pedicels subequal, ca. 2 × as long as perianth, ebracteolate. Perianth pale red; outer segments ovate,

ca. 3.5 × 1.8 mm; inner ones oblong, ca. 4 × 2 mm. Filaments equal, ca. 1.25 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base for ca. 1 mm, 1-toothed on each side. Ovary obovoid-globose, with concave nectaries covered by hoodlike projections at base. Style exserted. Fl. Aug–Oct.

• Slopes; 2000–2100 m. N Sichuan (Jinchuan Xian).

27. *Allium henryi* C. H. Wright, Bull. Misc. Inform. Kew 1895: 119. 1895.

疏花韭 shu hua jiu

Bulbs clustered, cylindrical, sometimes slightly thickened at base, 0.4–1.2 cm in diam.; tunic dark brown, reticulate. Leaves linear, longer than scape, 2–5 mm wide, flat, apex long acuminate. Scape 11–25 cm, terete, finely angled, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbel few flowered. Pedicels subequal, 1.5–2 × as long as perianth, ebracteolate. Perianth purple-blue to blue; segments ovate, 5.5–7 × ca. 3 mm; inner ones sometimes slightly longer than outer. Filaments slightly longer than to 1.5 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, 1-toothed on each side. Ovary obovoid-globose, with concave nectaries covered by hoodlike projections at base. Style exserted. Fl. and fr. Sep–Oct.

• Sunny slopes; 1300–2300 m. W Hubei, E Sichuan.

28. *Allium heteronema* F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 285. 1980.

异梗韭 yi geng jiu

Bulb cylindrical, slightly thickened at base, 0.8–1 cm in diam.; tunic dark brown, reticulate. Leaves subequaling scape, 3–7 mm wide, apex long acuminate. Scape 25–30 cm, terete, angled, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbel few flowered. Pedicels very unequal, 2–4 × as long as perianth, ebracteolate. Perianth purple-blue; outer segments narrowly ovate, 7–7.5 × 2–2.7 mm; inner ones narrowly oblong, ca. 8 × 2.5–2.7 mm. Filaments slightly longer than perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened for ca. 2.5 mm and oblong at base, 1-toothed on 1 or both sides. Ovary obovoid-globose, with concave nectaries covered by hoodlike projections at base. Style exserted. Fl. Aug.

• Slopes; 1600–2300 m. E Sichuan (Chengkou Xian, Nanchuan Xian).

29. *Allium paepalanthoides* Airy Shaw, Notes Roy. Bot. Gard. Edinburgh 16: 142. 1931.

天蒜 tian suan

Allium albotellerianum F. T. Wang & Tang.

Bulb solitary, narrowly ovoid-cylindrical, 0.5–1.5 cm in diam.; tunic yellowish brown to blackish brown, sometimes tinged with red, papery, lacinate, sometimes subfibrous. Leaves broadly linear to linear-lanceolate, shorter than to subequaling scape, 5–15(–23) mm wide, apex acuminate. Scape

(15–)30–50 cm, terete, covered with leaf sheaths for ca. 1/2 its length. Spathe 1-valved, persistent or deciduous; beak to 7 cm. Umbel laxly many flowered. Pedicels subequal, 2–4 × as long as perianth, ebracteolate. Perianth white; segments with green midvein; outer ones ovate, boat-shaped, 3–4.5 × 1.5–2.5 mm; inner ones ovate-oblong, 3.2–5 × 1.5–2.5 mm, apex truncate or obtuse. Filaments equal, 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, 1-toothed on each side, teeth 1.5–2 mm, irregularly denticulate at apex. Ovary obovoid, with concave nectaries covered by hoodlike projections at base. Style exserted. Fl. and fr. Aug–Sep. $2n = 16^*$.

• Forests, shady and moist slopes, streamsides; 1400–2000 m. W Henan, S Nei Mongol (Yin Shan), S Shaanxi, Shanxi, Sichuan.

30. Allium plurifoliatum Rendle, J. Bot. 44: 43. 1906.

多叶韭 duo ye jiu

Bulbs usually clustered, cylindric, thickened at base, 0.3–1 cm in diam.; tunic blackish brown to yellowish brown, fibrous, sometimes subreticulate. Leaves subequaling scape, 2–6(–8) mm wide, abaxially glaucous, margin revolute, apex long acuminate. Scape 15–40 cm, terete, covered with leaf sheaths for ca. 1/2 its length. Spathe 1-valved, persistent or deciduous; beak short. Umbel laxly flowered. Pedicels subequal, 2–4 × as long as perianth, ebracteolate. Perianth pale red or pale purple to purple; outer segments ovate, boat-shaped, 3.5–4.5(–6.5) × 1.5–2.4 (–3.4) mm; inner ones ovate-oblong, 4–5(–7) × 1.5–2.4(–3.4) mm, apex truncate or obtuse. Filaments equal, 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones subulate and entire at base or broadened and 1-toothed on each side at base, teeth (1–)2–3 mm, irregularly denticulate at apex. Ovary obovoid, with concave nectaries covered by hoodlike projections at base. Style exserted. Fl. and fr. Jul–Oct.

• Forests, slopes, pastures; 1600–3300 m. SE Anhui, Gansu, NW Hubei, Shaanxi, Sichuan.

1a. Inner filaments broadened at base, 1-toothed on each side, teeth irregularly denticulate at apex 30a. var. *plurifoliatum*

1b. Inner filaments subulate, entire at base 30b. var. *zhegushanense*

30a. Allium plurifoliatum var. *plurifoliatum*

多叶韭(原变种) duo ye jiu (yuan bian zhong)

Inner filaments broadened at base, 1-toothed on each side, teeth irregularly denticulate at apex. Fl. and fr. Aug–Oct. $2n = 16^*$, 32^* .

• Forests, slopes, pastures; 1600–3300 m. SE Anhui (Huang Shan), Gansu, NW Hubei, Shaanxi, Sichuan.

30b. Allium plurifoliatum var. *zhegushanense* J. M. Xu in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 285. 1980.

鹧鸪韭 zhe gu jiu

Inner filaments subulate, entire at base. Fl. and fr. Jul–Sep.

• Forests, slopes, pastures; 3200–3300 m. NC Sichuan (Li Xian).

31. Allium stenodon Nakai & Kitagawa, Rep. Exped. Manchoukuo Sect. 4, 1: 18. 1934.

雾灵韭 wu ling jiu

Allium plurifoliatum Rendle var. *stenodon* (Nakai & Kitagawa) J. M. Xu.

Bulbs usually clustered, cylindric, slightly thickened at base, 0.3–0.8 cm in diam.; tunic blackish brown, fibrous, sometimes subreticulate. Leaves linear, shorter than to subequaling scape, 2–3 mm wide, flat. Scape 20–50 cm, terete, covered with leaf sheaths for ca. 1/2 its length. Spathe 1-valved, persistent; beak short. Umbel hemispheric to subglobose, densely many flowered. Pedicels 1–1.5 × as long as perianth, ebracteolate. Perianth blue to purple-blue; outer segments ovate, boat-shaped, 4–5 × 2–3 mm; inner ones ovate-oblong, 4.5–5.5 × 2–3 mm. Filaments equal, 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, with 1 long tooth on each side, teeth sometimes denticulate at apex. Ovary obovoid, with concave nectaries covered by hoodlike projections at base. Style exserted. Fl. and fr. Jul–Sep.

• Forest margins, slopes, pastures; 1600–3000 m. Hebei, Henan, Nei Mongol, Shanxi.

32. Allium tuberosum Rottler ex Sprengel, Syst. Veg. 2: 38. 1825.

韭 jiu

Allium argyi H. Léveillé; *A. chinense* Maximowicz (1859), not G. Don (1827); *A. clarkei* J. D. Hooker; *A. roxburghii* Kunth; *A. sulvia* Buchanan-Hamilton ex D. Don; *A. tuberosum* Roxburgh (1832); *A. uliginosum* G. Don (1827), not Ledebour (1830); *A. yesoense* Nakai.

Bulbs clustered, cylindric; tunic dull yellow to yellowish brown, reticulate to subreticulate. Leaves linear, shorter than scape, 1.5–8 mm wide, flat, solid, margin smooth. Scape 25–60 cm, terete, usually 2-angled, covered with leaf sheaths only at base. Spathe 2- or 3-valved, persistent. Umbel hemispheric to subglobose, laxly many flowered. Pedicels subequal, 2–4 × as long as perianth, bracteolate and several covered with a common bract at base. Perianth white; segments usually with green or yellowish green midvein; outer ones oblong-ovate to oblong-lanceolate, 4–7(–8) × 1.8–3 mm; inner ones oblong-obovate, 4–7(–8) × 2.1–3.5 mm. Filaments narrowly triangular, equal, 2/3–4/5 as long as perianth segments, connate at base and adnate to perianth segments; inner ones slightly wider than outer at base. Ovary obconical-globose, minutely tuberculate, without concave nectaries at base. Fl. and fr. Jul–Sep. $2n = 16^*$, 24^* , 32^* .

Among shrubs, also widely cultivated as a vegetable; 1000–1100 m. Native in SW Shanxi (Yongji Xian); naturalized S China [tropical Asia].

Allium tuberosum is generally regarded as a cultivated species with a tetraploid chromosome number ($2n = 32$), although a wild population was recently discovered in Shanxi Province with a diploid number ($2n = 16$; Yang et al., Acta Phytotax. Sin. 36: 36–46. 1998). This species has leaves solid and perianth segments usually with a green or

yellowish green midvein, whereas its close wild relative, *A. ramosum*, differs in having leaves fistulose and perianth segments with a pale red midvein. One of us (Xu) agrees with Stearn (Herbertia 11: 238. 1946) that the name *A. tataricum* Linnaeus f. (Suppl. Pl. 196. 1782) should be regarded as a synonym of *A. ramosum*. On the other hand, Kamelin regards *A. tataricum* as a synonym of *A. tuberosum*, over which name it would have priority. He bases his opinion on two specimens (LE), labeled as *A. tataricum* and made from plants cultivated during the 1790s in the St. Petersburg Botanical Garden, and on his belief that only *A. tuberosum*, never *A. ramosum*, has been cultivated. However, Kamelin has observed that these two specimens have fistulose leaves, which suggests that they are *A. ramosum*, unless this character is not diagnostic for the two species. Xu has not seen the specimens but notes that they could be cultivated *A. ramosum* because, as noted by Stearn (loc. cit.: 229), *A. ramosum* was already in cultivation in Europe by 1750. Therefore, *A. tataricum* is here treated as a synonym of *A. ramosum*, based on Xu's opinion. The nomenclature of the two species remains unstable because, although the type of *A. tuberosum* (B) supports the current application of that name, no type has yet been designated for either *A. ramosum* or *A. tataricum*. Further studies are required in order to resolve the classification.

33. *Allium ramosum* Linnaeus, Sp. Pl. 1: 296. 1753.

野韭 ye jiu

Allium lancipetalum Y. P. Hsu; *A. odorum* Linnaeus; *A. potaninii* Regel; *A. tataricum* Linnaeus f.; *A. weichanicum* Palibin.

Bulbs clustered, subcylindric; tunic dull yellow to yellowish brown, reticulate to subreticulate. Leaves linear, shorter than scape, 1.5–8 mm wide, 3-angled, 1-keeled abaxially, fistulose, margin and angles scabrous-denticulate or smooth. Scape 25–60 cm, terete, obscurely angled, covered with leaf sheaths only at base. Spathe 1- or 2-valved. Umbel hemispheric to subglobose, many flowered. Pedicels subequal, 2–4 × as long as perianth, bracteolate and several covered with a common bract at base. Perianth white, sometimes slightly tinged with pale red; segments with pale red midvein; outer ones oblong-ovate to oblong-lanceolate, usually slightly narrower than inner, (4.5–)5.5–9(–11) × 1.5–2.9 mm; inner ones oblong-obovate, (4.5–)5.5–9(–11) × 1.8–3.1 mm. Filaments narrowly triangular, equal, 1/2–3/4 as long as perianth segments, connate at base and adnate to perianth segments; inner ones slightly wider than outer at base. Ovary obconical-globose, minutely tuberculate, without concave nectaries at base. Fl. and fr. Jun–Sep. $2n = 16^*$, 32^* .

Sunny hills, pastures; 500–2100 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Xinjiang [Kazakhstan, Mongolia, Russia].

34. *Allium oreoprasum* Schrenk, Bull. Sci. Acad. Imp. Sci. Saint-Petersbourg 10: 354. 1842.

滩地韭 tan di jiu

Bulbs clustered, narrowly ovoid-cylindric, 0.5–1 cm in diam.; tunic yellowish brown, reticulate. Leaves narrowly linear, shorter than (sometimes 1/2 as long as) scape, 1–3(–4) mm wide. Scape 11–30(–40) cm, terete, covered with leaf sheaths only at base. Spathe 1- or 2-valved, persistent. Umbel fascicled to hemispheric, few flowered. Pedicels subequal, 1.5–3 × as

long as perianth, bracteolate. Perianth pale red to white; segments with dark purple midvein, obovate-elliptic to broadly so, 4.2–7 × 2.5–4 mm, apex with a conduplicate and reflexed point; inner ones usually shorter and wider than outer. Filaments 1/2–3/4 as long as perianth segments, connate at base and adnate to perianth segments for 1.2–1.5 mm; outer ones narrowly triangular, slightly shorter than inner and ca. 1/2 as wide at base; inner ones broadly triangular. Ovary subglobose, without concave nectaries at base. Style not exerted; stigma slightly 3-cleft. Fl. and fr. Jun–Aug. $2n = 16, 48$.

Sunny slopes, stony shores of rivers; 1200–2700 m. Xinjiang, W Xizang [Afghanistan, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Uzbekistan].

35. *Allium humile* Kunth, Enum. Pl. 4: 443. 1843.

雪韭 xue jiu

Allium gowanianum Wallich ex Baker; *A. nivale* Jacquemont ex J. D. Hooker & Thomson.

Bulb solitary, cylindric; tunic brown, reticulate or subreticulate. Leaves 4–7, linear, 4–5 mm wide, flat, solid, fleshy, apex obtuse. Scape 5–15 cm, slightly compressed, covered with leaf sheaths only at base. Umbel hemispheric, many flowered. Pedicels subequal, 1.5–2 × as long as perianth. Perianth broadly exposed, white; segments with yellowish green midvein, lanceolate, 7–8(–10) × ca. 2 mm. Filaments equal, ca. 1/2 as long as perianth segments. Ovary obconical-globose. Style short; stigma slightly 3-cleft. Fl. Jun.

Slopes at high elevations; 4000–4500m. NW Xizang, NW Yunnan [India, Pakistan].

36. *Allium lineare* Linnaeus, Sp. Pl. 1: 295. 1753.

韭北 bei jiu

Bulb solitary or paired, cylindric-conical, 0.5–1.5 cm in diam.; tunic grayish brown, reticulate. Leaves linear, shorter than scape, 3–5 mm wide, flat, margin smooth. Scape 40–60 cm, terete, covered with leaf sheaths for 1/3–1/2 its length. Umbel usually globose, many flowered. Pedicels subequal, slender, bracteolate. Perianth pink-red; outer segments oblong-elliptic, slightly shorter than inner ones, 3.5–4 × ca. 2 mm; inner ones 4–5 × ca. 2 mm. Filaments 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, 1-toothed on each side. Ovary obovoid-globose, with concave nectaries at base. Style exerted; stigma punctiform. Fl. Jun. $2n = 16$.

Stony slopes, mostly in scrub; 1800–2400 m. NW Xinjiang [Kazakhstan, Mongolia, Russia].

37. *Allium schrenkii* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 3(2): 172. 1875.

单丝辉韭 dan si hui jiu

Allium bogdoicola Regel.

Bulb solitary, cylindric, 0.5–0.8 cm; tunic grayish brown, reticulate. Leaves linear, shorter than scape, 2–5 mm wide, flat,

margin smooth. Scape 20–40 cm, covered with leaf sheaths for ca. 1/3 its length. Umbel globose, many flowered. Pedicels equal, slender, bracteolate. Perianth pink or pinkish lilac; segments with purple midvein, oblong-linear, 3–4.5 mm. Filaments ca. 1.5 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones subulate from broadened base, entire. Ovary obovoid-globose, with concave nectaries at base. Style exserted; stigma punctiform. Fl. Jul. $2n = 32$.

Stony slopes in high mountains; 2400–2800 m. W Xinjiang [Kazakhstan, Mongolia, Russia].

38. *Allium amphibolum* Ledebour, Fl. Altaic. 2: 5. 1830.

直立韭 zhi li jiu

Bulbs densely clustered, cylindric-conical, 1–1.5 cm in diam.; tunic yellowish brown, reticulate. Leaves linear, shorter than scape, 3–5 mm wide, flat, margin smooth. Scape 20–30 cm, covered with leaf sheaths for 1/4–1/3 its length. Umbel hemispheric, densely many flowered. Pedicels equal, very short, bracteolate. Perianth rose lilac or purplish red; segments with dark purple midvein; outer ones lanceolate, 5–6 mm, apex usually hooded. Filaments dark red, slightly longer than perianth segments; inner ones broadened at base, with 1 short, rounded tooth on each side. Ovary subglobose, with concave nectaries at base. Style very long, exserted; stigma punctiform. Fl. Jul. $2n = 48$.

Slopes; 2500–3000 m. W Xinjiang [Kazakhstan, Mongolia, Russia].

39. *Allium strictum* Schrader, Hort. Gott. 7. 1809.

辉韭 hui jiu

Bulb solitary or paired, subcylindric, 0.5–0.8 cm in diam.; tunic grayish brown, reticulate. Leaves linear, shorter than scape, 3–5 mm wide, flat, margin scabrous-denticulate. Scape (40–)50–80 cm, terete, covered with leaf sheaths for 1/3–1/2 its length. Spathe usually persistent. Umbel globose, densely many flowered. Pedicels subequal, straight, 1–2 × as long as perianth, not slender, bracteolate. Perianth dark rose pink to pale purple-red; segments usually with dark purple midvein, elliptic, 4–5 × 2–2.3 mm, apex rounded. Filaments slightly shorter than to equaling perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, with 1 short, rounded tooth on each side, teeth very rarely with 2 rounded teeth at apex. Ovary obovoid-globose, with concave nectaries at base. Style long exserted; stigma usually subcapitate. Fl. Jun. $2n = 32^*$, 40, 48.

Stony slopes, cliffs; 400–1500 m. NW Gansu, Nei Mongol, Xinjiang (Altay Shan, Tian Shan) [Kazakhstan, Kyrgyzstan, Mongolia, Russia; Europe].

40. *Allium splendens* Willdenow ex Schultes & J. H. Schultes in Roemer & Schultes, Syst. Veg. 7: 1025. 1830.

丽韭 li jiu

Bulb solitary or paired, narrowly cylindric or cylindric-conical, 0.4–0.7 cm in diam.; tunic grayish brown, reticulate. Leaves linear or narrowly linear, shorter than scape, 1–3(–4)

mm wide, flat, margin scabrous-denticulate. Scape 20–35(–50) cm, slender, terete. Spathe persistent. Umbel hemispheric, many flowered. Pedicels subequal, ca. 2 × as long as perianth, very slender, bracteolate. Perianth pale lilac or pinkish lilac; segments with purple midvein, lanceolate to narrowly elliptic, 3.5–4 × ca. 1.5 mm, apex rounded. Filaments 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones with enlarged base wider than long, with 1 or 2 teeth on each side. Ovary subglobose, with concave nectaries at base. Style long exserted; stigma capitate. Fl. Jun. $2n = 16, 32, (40)$.

Forests, scrub, meadows, moist slopes; 100–1000 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia].

41. *Allium maackii* (Maximowicz) Prokhanov ex Komarov & Alissova-Klobukova, Key Pl. Far East. USSR 1: 366. 1931.

马克韭 ma ke jiu

Allium lineare Linnaeus var. *maackii* Maximowicz, Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans 9: 282. 1859; *A. prokhanovii* (Voroschilov) Barkalov; *A. splendens* Willdenow ex Schultes & J. H. Schultes subsp. *prokhanovii* Voroschilov.

Bulb solitary or clustered, cylindric-obovoid, to 1.5 cm wide; outer tunic yellowish brown, reticulate; inner layers leathery, ± neither lacinate nor fibrous. Leaves linear or narrowly so, shorter than scape, 2–3 mm wide, flat, margin scabrous-denticulate or smooth. Scape 20–50 cm, terete, furrowed, covered with leaf sheaths for 1/4–1/3 its length. Spathe persistent. Umbel hemispheric or globose, many flowered. Pedicels subequal, 1.5–2 × as long as perianth, bracteolate. Perianth rose pink; segments with purple midvein, oblong or oblong elliptic, 4–5 × 1.5–2 mm, apex obtuse. Filaments 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, 1-toothed on each side, teeth sometimes forked. Ovary subglobose, with concave nectaries at base. Style long exserted; stigma subglobose. Fl. Jun. $2n = 32$.

Dry slopes and cliffs; 200–500 m. Heilongjiang [Russia].

42. *Allium clathratum* Ledebour, Fl. Altaic. 2: 18. 1830.

细叶北韭 xi ye bei jiu

Bulb solitary or paired, cylindric-conical, 0.7–1 cm wide; tunic grayish brown, reticulate. Leaves usually shorter than scape, 0.5–1.5 mm wide, semiterete, margin smooth. Spathe persistent; beak very short. Umbel usually hemispheric, many flowered. Pedicels subequal, very slender, 2–3(or more) × as long as perianth, bracteolate. Perianth pink or pale pink; segments with dark red midvein, broadly linear or narrowly lanceolate, 4–5 × 1–1.5 mm, apex obtusely triangular. Filaments 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, entire or with 1 or 2 teeth on each side. Ovary subglobose, with concave nectaries at base. Style long exserted; stigma punctiform. Fl. Jun. $2n = 16, 32$.

Mostly dry slopes, cliffs; 400–2000 m. Xinjiang [Kazakhstan, Mongolia, Russia].

43. *Allium siphonanthum* J. M. Xu in F. T. Wang & Tang, Fl.

Reipubl. Popularis Sin. 14: 284. 1980.

管花韭 guan hua jiu

Bulb solitary or clustered, cylindrical, 1–1.5 cm in diam.; tunic yellowish brown, subreticulate. Leaves subequalling scape, 1.5–3 mm wide. Scape 18–60 cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel globose, densely many flowered. Pedicels subequal, shorter than perianth, ebracteolate. Perianth purple red; segments obovate-oblong, 5.5–7.8 × 1.8–3 mm, basally united into a tube 1.5–2 mm, apex obtuse, sometimes retuse; inner ones slightly longer than outer, apex obtuse, irregularly denticulate. Filaments equal, ca. 1.5 × as long as perianth segments, connate at base and adnate to perianth segments for 1.5–2 mm; outer ones subulate; inner ones 3.2–4.5 mm wide at base, entire or 1-toothed on each side. Ovary obovoid-globose, without concave nectaries at base. Style much longer than ovary, exserted. Fl. and fr. Sep–Oct.

• Slopes; ca. 2800 m. NW Yunnan.

44. *Allium flavidum* Ledebour, Fl. Altaic. 2: 7. 1830.

新疆韭 xin jiang jiu

Bulb solitary or paired, narrowly ovoid-cylindrical, 0.4–1 cm in diam.; tunic grayish brown to yellowish brown, reticulate. Leaves linear, shorter than scape, 2–5(–7) mm wide, margin scabrous-denticulate, apex obtuse. Scape 10–45 cm, terete, covered with leaf sheaths for 1/3–1/2 its length. Spathe 2-valved, persistent. Umbel globose, densely many flowered. Pedicels subequal, usually subequalling perianth (rarely ca. 2 × as long), bracteolate. Perianth white to pale yellow, lustrous; segments oblong to ovate-oblong, 4–6 × 1.2–2 mm; inner ones 1.2–1.25 × as long as outer. Filaments equal, 1.2–1.5 × as long as perianth segments, connate at base and adnate to perianth segments; inner ones with an enlarged base longer than wide, 1-toothed on each side. Ovary obovoid-globose, with concave nectaries at base. Style exserted. Fl. and fr. Jul–Aug.

Rock crevices in forests, sunny slopes. N Xinjiang [Kazakhstan, Mongolia, Russia].

45. *Allium leucocephalum* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 27(2): 123. 1854.

白头韭 bai tou jiu

Bulb solitary or paired, subcylindrical, 0.6–1.3 cm in diam.; tunic dark yellowish brown, reticulate. Leaves shorter than scape, (1–)2–5 mm wide, semiterete, fistulose, adaxially channeled, smooth. Scape 20–50(–60) cm, terete, covered with leaf sheaths for ca. 1/3 its length. Spathe 2-valved, persistent. Umbel globose, densely many flowered. Pedicels subequal, slightly less than to 1.5 × as long as perianth, bracteolate. Perianth white or slightly tinged with yellow; inner segments oblong-ovate, 3.5–5.5 × 1.4–2 mm. Filaments equal, slightly longer than to 2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, 1-toothed on each side, teeth sometimes irregularly 2–4-denticulate at apex. Ovary obovoid, with concave nectaries at base. Style exserted. Fl. and fr. Jul–Aug. $2n = 16^*$, 32.

Sandy places. Gansu, Heilongjiang, Nei Mongol [Mongolia, Russia].

46. *Allium flavovirens* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 10: 344. 1887.

阿拉善韭 a la shan jiu

Allium alaschanicum Y. Z. Zhao.

Bulb solitary or in clusters of 2 or 3, cylindrical, 0.8–2 cm in diam.; tunic yellowish brown to dark brown, lacinate or fibrous. Leaves subequalling to conspicuously longer than scape, 2–4 mm wide, adaxially channeled. Scape 15–25 cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent; beak long. Umbel hemispheric to globose, many flowered. Pedicels subequal, 1.5–2 × as long as perianth, ebracteolate. Perianth white or pale yellow; segments oblong to ovate-oblong, 4–6 × 1.7–2.5 mm; outer ones pale purple-red abaxially; inner ones slightly longer than outer. Filaments equal, 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, base longer than wide, with 1 obtuse or acute tooth on each side. Ovary subglobose, with concave nectaries at base. Style exserted. Fl. and fr. Aug–Sep.

• Rock crevices, calcareous slopes, dry places; 1800–3100 m. W Nei Mongol (Helan Shan).

47. *Allium eduardii* Stearn in Airy Shaw, Herbertia 11: 102. 1946.

贺兰韭 he lan jiu

Allium fischeri Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 3(2): 161. 1875, not Besser (1830).

Bulbs densely clustered, narrowly ovoid-cylindrical, 0.5–1 cm in diam., usually covered with a common tunic; tunic yellowish brown, reticulate. Leaves shorter than scape, ca. 1 mm wide, semiterete, adaxially channeled. Scape 11–30 cm, terete, covered with leaf sheaths only at base. Spathe 1-valved, persistent; beak ca. 3 × as long as limb. Umbel hemispheric. Pedicels subequal, 1.5–3 × as long as perianth, bracteolate. Perianth pale purple to purple; segments oblong-ovate to oblong-lanceolate, 5–6.5 × 2–2.5 mm, apex with a reflexed point; inner ones ca. 1 mm longer than outer. Filaments equal, equaling or slightly longer than perianth segments, connate at base and adnate to perianth segments for ca. 1 mm; outer ones subulate; inner ones broadened for 1/5–1/4 their length, with 1 sharp tooth on each side. Ovary subglobose, without concave nectaries at base. Style much longer than ovary, exserted. Fl. Aug. $2n = 32^*$.

Dry slopes, plains. N Hebei, SW Nei Mongol, N Ningxia, N Xinjiang [Mongolia, Russia].

48. *Allium przewalskianum* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 3(2): 164. 1875.

青甘韭 qing gan jiu

Allium jacquemontii Regel (1875), not Kunth (1843); *A. junceum* Jacquemont ex Baker (1874), not Smith (1809); *A. stoliczkae* Regel.

Bulbs clustered, narrowly ovoid-cylindric, 0.5–1 cm in diam., sometimes covered with common tunic; tunic red, rarely light brown, reticulate. Leaves shorter or slightly longer than scape, 0.5–1.5 mm wide, semiterete to terete, 4- or 5-angled. Scape 10–40 cm, terete, covered with leaf sheaths only at base. Spathe 1-valved, persistent; beak usually equaling limb. Umbel hemispheric to globose, densely many flowered. Pedicels subequal, 2–3 × as long as perianth, ebracteolate, rarely a few bracteolate. Perianth pale red to dark purple; outer segments ovate to narrowly so, 3–6 × 1.5–2.5 mm; inner ones oblong to oblong-lanceolate, 4–6.5 × 1.5–2.5 mm. Filaments equal, 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened for 1/3–1/2 their length, 1-toothed on each side. Ovary globose, without concave nectaries at base. Style much longer than ovary, exerted. Fl. and fr. Jun–Sep. $2n = 32^*$.

Scrub, dry slopes, plains, rock crevices; 2000–4800 m. Gansu, Nei Mongol, Ningxia, Qinghai, Shaanxi, Sichuan, Xinjiang, Xizang, NW Yunnan [India, Nepal, Pakistan].

49. *Allium teretifolium* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 5: 629. 1878.

新疆韭 xi jiang jiu

Allium grimmii Regel.

Bulbs usually clustered, narrowly ovoid, ca. 1 cm in diam.; tunic yellowish brown, subreticulate to reticulate. Leaves 3 or 4, shorter than to equaling scape, 0.5–1 mm wide, nearly semiterete, adaxially channeled, smooth. Scape 10–50 cm, terete, covered with leaf sheaths for 1/4–1/2 its length. Spathe 2-valved. Umbel nearly hemispheric. Pedicels unequal, 1.5–2 × as long as perianth, bracteolate. Perianth pale purple to pale red; segments subequal, 6–7(–9) × 2–2.5(–3) mm. Filaments equal, 2/3–5/6 as long as perianth segments, connate at base and adnate to perianth segments for ca. 1/5 their length; inner ones broadly triangular at base, ca. 3 × as wide as outer and gradually attenuate distally. Ovary narrowly ovoid, with small, concave nectaries at base. Style not exerted. Fl. and fr. Jul–Aug.

Dry and gravelly slopes. Xinjiang (Tian Shan) [Kazakhstan, Kyrgyzstan].

50. *Allium tekesicola* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 10: 350. 1887.

荒漠韭 huang mo jiu

Allium deserticola M. Popov.

Bulb usually solitary, rarely paired, narrowly ovoid, 0.7–1 cm in diam.; outer tunic chestnut brown or pale brown, scarios, finely subreticulate; inner layers scarios, yellowish brown. Leaves subulate to narrowly linear, shorter than scape, 0.5–1 mm wide, semiterete, adaxially channeled. Scape 20–60 cm, terete, covered with leaf sheaths for ca. 1/3 its length, smooth. Spathe 2-valved, persistent; beak 2–3 × as long as limb. Umbel laxly few flowered. Pedicels unequal, 2–7 × as long as perianth, bracteolate. Perianth pale red; segments with dark red midvein, equal, oblong-lanceolate, 6–8 × ca. 2 mm, apex acute. Filaments subequal, 2/3–3/4 as long as perianth segments, connate at base and adnate to perianth segments for

1–1.5 mm; outer ones subulate; inner ones subulate from triangular base. Ovary conical-ovoid, with very small, concave nectaries at base. Style not exerted, 2–3(–4) mm; stigma capitate, small. Fl. Jun–Jul.

Dry slopes. W Xinjiang (basin of Ili He) [Kazakhstan (middle part of basin of Ili River)].

51. *Allium mongolicum* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 3(2): 160. 1875.

蒙古韭 meng gu jiu

Bulbs densely clustered, cylindric; tunic brownish yellow, fibrous. Leaves shorter than scape, 0.5–1 mm wide, semiterete to terete. Scape 10–30 cm, terete, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbel hemispheric to globose, densely many flowered. Pedicels 1–2 × as long as perianth, ebracteolate. Perianth pale red or pale purple-red to purple-red; segments ovate-oblong, 6–9 × 3–5 mm, apex obtuse; inner ones usually slightly longer than outer. Filaments subequal, 1/2–2/3 as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones ovate for ca. 1/2 their length. Ovary obovoid-globose, without concave nectaries at base. Style not exerted. Fl. and fr. Jul–Sep. $2n = 16^*$.

Deserts, sandy places, dry slopes; 800–2800 m. Gansu, W Liaoning, Nei Mongol, N Ningxia, N Qinghai, N Shaanxi, NE Xinjiang [Kazakhstan, Mongolia, Russia].

52. *Allium caespitosum* Sievers ex Bongard & C. A. Meyer, Bull. Sci. Acad. Imp. Sci. Saint-Petersbourg 8: 341. 1841.

疏生韭 shu sheng jiu

Bulbs laxly clustered, cylindric, attached to a horizontal, elongate rhizome; tunic grayish brown, membranous, lacinate. Leaves shorter than scape, ca. 1 mm wide, semiterete. Scape 9–20 cm, terete, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbel hemispheric. Pedicels 1–1.5 × as long as perianth, ebracteolate. Perianth white, usually tinged with pink; segments elliptic to ovate, 6–7 × 3–4 mm, apex obtuse; inner ones slightly longer than outer. Filaments subequal, 2/3–3/4 as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones narrowly ovate for ca. 1/2 their length. Ovary subglobose, without concave nectaries at base. Style not exerted. Fl. and fr. Jun–Aug.

Deserts, sandy places. N Xinjiang [Kazakhstan].

53. *Allium yongdengense* J. M. Xu in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 284. 1980.

永登韭 yong deng jiu

Bulbs clustered, cylindric, 0.3–0.5 cm in diam.; tunic grayish brown, papery, subfibrous at apex. Leaves shorter than scape, 0.5–1 mm wide, semiterete. Scape 13–17 cm, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel few flowered. Pedicels subequal, ca. 2 × as long as perianth, ebracteolate. Perianth purple-red; segments ovate-oblong, 7–9 × 2.5–3 mm; inner ones slightly longer than outer. Filaments subequal, 2/3–3/4 as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner

ones broadened at base, narrowly triangular. Ovary narrowly ovoid, without concave nectaries at base. Style not exerted. Fl. and fr. Aug–Sep.

• Sunny and dry slopes. Gansu (Yongdeng Xian), E Qinghai (Ledu Xian).

54. *Allium subangulatum* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 10: 340. 1887.

紫花韭 zi hua jiu

Bulbs densely clustered, cylindrical, 0.5–1 cm in diam.; tunic yellowish brown to dark chestnut brown, subreticulate to reticulate. Leaves shorter than scape, ca. 1 mm wide, semiterete, margin scabrous-denticulate, rarely smooth. Scape 15–35 cm, terete, covered with leaf sheaths only at base. Spathe 2- or 3-valved, persistent. Umbel hemispheric, densely many flowered. Pedicels 1–1.5 × as long as perianth, bracteolate, rarely ebracteolate. Perianth purple-red to pale purple-red; segments with red midvein; outer ones ovate to narrowly so, 6–8.5 × 2.5–3 mm; inner ones oblong-ovate, slightly longer than outer ones. Filaments equal, slightly shorter than perianth segments, connate at base for 1/3–1/2 their length, adnate to perianth segments for 1/3–1/2 of connate part; outer ones subulate; inner ones broadened at base, 1-toothed on each side. Ovary ovoid, without concave nectaries at base. Style longer than ovary, exerted. Fl. and fr. Jun–Aug.

• Sunny and dry slopes. Gansu, Ningxia, Qinghai.

55. *Allium polyrhizum* Turczaninow ex Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 3(2): 162. 1875.

碱韭 jian jiu

Allium polyrhizum var. *przewalskii* Regel.

Bulbs densely clustered, cylindrical, 0.5–1 cm in diam.; tunic yellowish brown to dark chestnut brown, subreticulate to reticulate. Leaves shorter than scape, 0.3–1 mm wide, semiterete, scabrous-denticulate or rarely smooth on margin. Scape 7–30 cm, terete, covered with leaf sheaths only at base. Spathe 2- or 3-valved, persistent. Umbel hemispheric, densely many flowered. Pedicels 1–2 × as long as perianth, bracteolate or rarely ebracteolate. Perianth purple-red to pale purple-red, rarely white; segments with red midvein; outer ones ovate to narrowly so, 3–5 × 1.5–2.5 mm; inner ones oblong-ovate, 4–6 × 1.5–2 mm. Filaments equal, equaling or slightly longer than perianth segments, connate at base for 1/6–1/3 their length, adnate to perianth segments for 1/3–1/2 of connate part; outer ones subulate; inner ones broadened at base, 1-toothed on each side. Ovary ovoid, without concave nectaries at base. Style longer than ovary, exerted. Fl. and fr. Jun–Aug. $2n = 32^*$.

Sunny slopes, pastures, saline-alkaline soils, gravelly places, desert steppes; 1000–3700 m. Gansu, N Hebei, W Heilongjiang, W Jilin, N Liaoning, Nei Mongol, N Ningxia, Qinghai, N Shaanxi, N Shanxi, Xinjiang [Kazakhstan, Mongolia, Russia].

56. *Allium bidentatum* Fischer ex Prokhanov & Ikonnikov-Galitzky, Mater. Comm. Étude Republ. Mongol. Tannou-Touva 2: 83. 1929.

砂韭 sha jiu

Allium bidentatum var. *andaense* Q. S. Sun; *A. edentatum* Y. P. Hsu; *A. omiostema* Airy Shaw; *A. polyrhizum* Turczaninow ex Regel var. *potaninii* Regel.

Bulbs usually densely clustered, cylindrical, sometimes slightly thickened at base, 0.3–0.4 cm in diam.; tunic brown to grayish brown, thinly leathery, lacinate, apex sometimes fibrous. Leaves shorter than scape (usually ca. 1/2 as long), 1–1.5 mm wide, semiterete. Scape 10–30 cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel hemispheric, densely many flowered. Pedicels 1(–1.5) × as long as perianth, ebracteolate. Perianth red to pale purple-red; outer segments oblong-ovate to ovate, 4–5.5 × 1.5–2.8 mm; inner ones narrowly oblong to oblong-elliptic, 5–6.5 × 1.5–3 mm, apex subtruncate, usually irregularly denticulate. Filaments equal, slightly shorter than perianth segments, connate at base and adnate to perianth segments for 0.6–1 mm; outer ones subulate; inner ones ovate-oblong for ca. 4/5 their length, with 1 obtuse tooth on each side, rarely entire. Ovary ovoid-globose, minutely or inconspicuously tuberculate, without concave nectaries. Style not exerted. Fl. and fr. Jul–Sep. $2n = 32^*$.

Sunny slopes, pastures, meadows, saline places; 600–2000 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi, NE Xinjiang [Kazakhstan, Mongolia, Russia].

57. *Allium dentigerum* Prokhanov, Izv. Glavn. Bot. Sada SSSR 29: 563. 1930.

短齿韭 duan chi jiu

Bulbs clustered, cylindrical, slightly thickened at base, 0.3–0.6 cm in diam.; tunic grayish white, sometimes slightly tinged with red, papery, lacinate, apex sometimes fibrous. Leaves ca. 1/2 as long as scape, 0.5–1 mm wide, semiterete. Scape 15–35 cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel hemispheric to globose, densely many flowered. Pedicels subequal, 2–3 × as long as perianth, ebracteolate. Perianth purple-red; outer segments ovate, 3–3.5 × 1.8 mm; inner ones ovate-oblong, 3.8–4.2 × 1.8–2.2 mm, apex obtuse, usually irregularly denticulate. Filaments equal, slightly shorter than to equaling perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadly ovate at base, with 1 obtuse tooth on each side, rarely entire. Ovary ovoid-globose, minutely tuberculate, without concave nectaries at base. Style slightly longer than ovary, not exerted. Fl. Aug.

• Slopes, pastures, sandy soils; 1500–2500 m. Gansu, NW Shaanxi.

58. *Allium tenuissimum* Linnaeus, Sp. Pl. 1: 301. 1753.

细叶韭 xi ye jiu

Allium tenuissimum var. *nalanicum* Shan Chen.

Bulbs clustered, subcylindrical; tunic grayish violet or grayish brown to blackish brown, membranous, apex splitting; inner layers usually pinkish lilac. Leaves shorter than scape, 0.5–1 (–2) mm wide, semiterete to subterete, smooth, rarely scabrous along ribs and at margin. Scape 10–35(–50) cm, terete, finely

angled, smooth, covered with leaf sheaths for ca. 1/4 its length. Umbel hemispheric to fascicled, laxly flowered. Pedicels subequal, 1.5–3 × as long as perianth, smooth, rarely scabrous along angles, ebracteolate. Perianth white or pinkish white, rarely purple-red; segments with dark purple, fine midvein; outer ones ovate-oblong to broadly so, 2.8–4 × 1.5–2 mm, apex obtuse; inner ones obovate-oblong, 3–4.2 × 1.8–2.7 mm, apex truncate to truncate-obtuse. Filaments ca. 2/3 as long as perianth segments, connate at base and adnate to perianth segments; outer ones ± subulate; inner ones with basal ca. 2/3 broadened, ovate-orbicular, entire. Ovary subglobose, without concave nectaries at base. Style not exerted. Fl. and fr. Jul–Sep. $2n = 16^*$.

Slopes, pastures, sandy places; near sea level to 2000 m. Gansu, Hebei, Heilongjiang, Henan, N and S Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, N Xinjiang (Altay Shan), Zhejiang [Kazakhstan, Mongolia, Russia].

Allium tenuissimum differs in only a few characters from *A. elegantulum*, which was treated as a synonym of the former in FRPS.

59. *Allium elegantulum* Kitagawa in Nakai et al., Rep. Exped. Manchoukuo Sect. 4, 2: 98. 1935.

雅韭 ya jiu

Bulbs clustered, cylindric, 0.3–0.5 cm wide; tunic whitish yellow or yellowish brown to dark gray, membranous, lacinate. Leaves subulate to narrowly linear, (1–)3–4 mm wide, semiterete, margin smooth. Scape 10–16(–20) cm × (0.5–)1–1.5 mm, terete, smooth, covered with leaf sheaths only at base. Umbel hemispheric to globose, densely many flowered. Pedicels 1–1.5 × as long as perianth, ebracteolate. Perianth white to pinkish white; segments with red midvein; outer ones elliptic to ovate, ca. 3 × 1.8–2 mm; inner ones obovate, 3.5–4 × 1.8–2 mm, apex truncate, sometimes obscurely denticulate. Filaments shorter than perianth segments, connate at base; outer ones ± subulate; inner ones subulate from obovate base. Ovary subglobose. Style short; stigma punctiform. Fl. Jul–Aug.

• Sandy or stony places, cliffs. Liaoning.

60. *Allium anisopodium* Ledebour, Fl. Ross. 4: 183. 1852.

矮韭 ai jiu

Bulbs clustered, subcylindric; tunic violet-brown, or blackish brown to grayish brown, membranous, irregularly splitting, apex sometimes subfibrous. Leaves subequaling scape, 1–2(–4) mm wide, smooth or scabrous along angles. Scape (20–)30–50(–65) cm, terete, finely angled, smooth or scabrous, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbel subfascicled, laxly flowered. Pedicels unequal, especially in fruit, 1.5–3.5 cm, smooth or scabrous angled, ebracteolate. Perianth pale purple to purple-red; outer segments ovate-oblong to broadly so, 4–5 × 2–3 mm, apex obtuse; inner ones obovate-oblong, 4–5 × 2.2–3.2 mm, apex truncate to obtuse-truncate. Filaments ca. 2/3 as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate, sometimes slightly broadened at base, slightly shorter than inner; inner ones ovate-orbicular for ca. 2/3 their length, rarely with 1 small tooth on each side. Ovary ovoid-globose, without concave nectaries at base. Style not exerted. Fl. and fr. Jul–Sep.

Slopes, pastures, sandy places; near sea level to 2200 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, N Xinjiang [Kazakhstan, Korea, Mongolia, Russia].

1a. Leaves and pedicels smooth, rarely scabrous; scape smooth 60a. var. *anisopodium*

1b. Leaves, scape, and pedicels scabrous along angles 60b. var. *zimmermannianum*

60a. *Allium anisopodium* var. *anisopodium*

矮韭(原变种) ai jiu (yuan bian zhong)

Allium tchefouense Debeaux; *A. tenuissimum* Linnaeus var. *purpureum* Regel.

Leaves and pedicels smooth, rarely scabrous. Scape smooth. $2n = 16^*$, 32^* .

Slopes, pastures, sandy places; near sea level to 1300 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shandong, N Xinjiang [Kazakhstan, Korea, Mongolia, Russia].

60b. *Allium anisopodium* var. *zimmermannianum* (Gilg) F. T. Wang & Tang, Contr. Inst. Bot. Natl. Acad. Peiping 2(8): 260. 1934.

糙萆韭 cao ting jiu

Allium zimmermannianum Gilg, Bot. Jahrb. Syst. 34 (Beibl. 75): 23. 1904; *A. tenuissimum* Linnaeus f. *zimmermannianum* (Gilg) Q. S. Sun.

Leaves, scape, and pedicels scabrous along angles. Fl. and fr. Jun–Sep. $2n = 16^*$, 32^* .

• Slopes, pastures, sandy places; near sea level to 2200 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi.

61. *Allium weschniakowii* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 531. 1880.

坛丝韭 tan si jiu

Bulbs clustered, cylindric, 0.3–0.5 cm in diam.; tunic dirty gray, sometimes tinged with brown, membranous, ± entire. Leaves 3 or 4, slender, shorter than scape, 0.5–1 mm wide, semiterete, adaxially channeled. Scape 9–16 cm, slender, terete, finely angled, covered with leaf sheaths only at base. Spathe 1- or 2-valved, persistent. Umbel laxly few flowered. Pedicels subequal, 1.5–2 × as long as perianth, ebracteolate. Perianth pale red to pinkish lilac; segments with dark violet midvein; outer ones ovate-elliptic, 5–6 × 2–2.5 mm; inner ones oblong-elliptic, 6–7 × 2–2.5 mm. Filaments urceolate, 2/3–3/4 as long as perianth segments, connate for 3/4–4/5 their length, basally adnate to perianth segments; outer ones subulate, free part shorter than that of inner ones; inner ones adnate to perianth segments for nearly 1/2 their length, free part narrowly triangular or shoulder-shaped, sometimes 1-toothed on each side. Ovary ellipsoid to ovoid-globose, without concave nectaries. Style not exerted. Fl. Aug.

Dry slopes, gravelly places. NW Xinjiang [Kazakhstan, Kyrgyzstan].

62. *Allium prostratum* Treviranus, *Allii* Sp. 16. 1822.

蒙古野韭 meng gu ye jiu

Allium congestum G. Don; *A. declinatum* Willdenow; *A. deflexum* Fischer ex Schultes & J. H. Schultes; *A. fischeri* Besser ex Schultes & J. H. Schultes; *A. satoanum* Kitagawa.

Bulb solitary or paired, subcylindric, 0.5–1 cm in diam., attached to a horizontal, robust rhizome; tunic light brown, sometimes tinged with black, subleathery, apex usually entire, sometimes lacinate. Leaves shorter than scape, 0.7–1.5 mm wide, semiterete, adaxially channeled, margin scabrous. Scape 10–25 cm, terete, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbel hemispheric. Pedicels subequal, 2–3 × as long as perianth, bracteolate or ebracteolate. Perianth pale purple to purple-red; outer segments ovate, 3.2–5 × 1.8–2.9 mm; inner ones oblong to oblong-ovate, 4–5.5 × 2.2–3.2 mm, apex obtuse, distal margin and apex irregularly crenulate. Filaments equal, equaling to slightly longer than perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones narrowly triangular-subulate, 2–3 × as wide as outer ones. Ovary obovoid, minutely tuberculate, without concave nectaries at base. Style exserted. Fl. and fr. Jul–Aug.

Stony slopes, steppes. N Nei Mongol (Hulun Buir, Manzhouli Shi), N Xinjiang (Tacheng Xian, Toli Xian) [Mongolia, Russia].

63. *Allium rubens* Schrader ex Willdenow, *Enum. Pl.* 1: 360. 1809.

红花韭 hong hua jiu

Bulbs clustered, narrowly conical, 0.5–1 cm in diam., attached to a horizontal rhizome; tunic light brown, subleathery, subentire. Leaves subequaling scape, 1–1.5(–2) mm wide, adaxially channeled, margin ± scabrous. Scape 10–25 cm, terete, slightly angled, covered with leaf sheaths only at base. Spathe persistent. Umbel hemispheric to globose, few flowered. Pedicels equal, 2(–3) × as long as perianth, ebracteolate. Perianth purple-red; segments with conspicuous midvein, broadly elliptic to ovate, (4–)5 mm, apex obtuse; outer ones boat-shaped; inner ones slightly longer than outer. Filaments subulate, subequal, 1–2 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary subglobose, without concave nectaries at base. Style not exserted. Fl. and fr. Jun–Aug. $2n = 16$.

Scrub, stony slopes, steppes. NW Xinjiang (Toli Xian) [Kazakstan, Mongolia, Russia].

64. *Allium brevidentatum* F. Z. Li, *Bull. Bot. Res.*, Harbin 6(1): 170. 1986.

矮齿韭 ai chi jiu

Bulb usually solitary, cylindrical; tunic brown, pale brown inside, usually irregularly splitting at apex. Leaves linear, longer than scape, 2–3 mm wide, flat. Scape 20–30 cm, terete, finely angled near apex. Spathe 2-valved, persistent. Umbel laxly flowered. Pedicels subequal, ca. 2 × as long as perianth, ebracteolate. Perianth pale yellowish green; outer segments oblong, boat-shaped, ca. 5 mm; inner ones oblong, ca. 5.5 mm.

Filaments equal, ca. 1.5 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, 1-toothed on each side. Ovary ovoid, with concave nectaries covered by hoodlike projections at base. Style exserted, ca. 4 mm. Fl. Jul.

• Sunny slopes. C Shandong (Tai Shan).

65. *Allium taishanense* J. M. Xu in F. T. Wang & Tang, *Fl. Reipubl. Popularis Sin.* 14: 285. 1980.

泰山韭 tai shan jiu

Bulb solitary or clustered, subcylindric, ca. 0.5 cm in diam., attached to an oblique, stout rhizome; tunic grayish black, membranous, entire. Leaves broadly linear, shorter than to subequaling scape, 7–10 mm wide, attenuate at both ends, abaxially 1-angled, scabrous-denticulate along angle and margin. Scape 22–27 cm, 2-angled, scabrous-denticulate along angles, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel nearly hemispheric, many flowered. Pedicels subequal, 2–3 × as long as perianth, ebracteolate. Perianth pale red to white; segments ovate-oblong; outer ones 3.2–3.8 × 1.7–1.9 mm; inner ones 3.7–4.6 × 2.2–2.5 mm. Filaments equal, slightly longer than perianth segments, connate at base and adnate to perianth segments for ca. 0.6 mm; outer ones ca. 1/2 as wide at base as inner; inner ones with a broadened, triangular base. Ovary obovoid-globose, with concave nectaries covered by hoodlike projections at base. Style exserted. Fl. Sep.

• Slopes; 300–600 m. C Shandong (Tai Shan).

66. *Allium chiwui* F. T. Wang & Tang, *Bull. Fan Mem. Inst. Biol.* 7: 294. 1937.

冀韭 ji jiu

Bulb solitary or clustered, subcylindric, 0.7–1.3 cm in diam., attached to a horizontal, stout rhizome; tunic grayish black, sometimes tinged with purple, membranous, entire. Leaves linear, shorter than to subequaling scape, 2–5 mm wide, flat, smooth, apex obtuse. Scape 13–30 cm, terete, 2-angled, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel hemispheric, densely many flowered. Pedicels subequaling perianth, ebracteolate. Perianth white to yellow; outer segments ovate, boat-shaped, 4–6 × 2–2.5 mm; inner ones ovate-oblong, 4.5–7 × 2.2–2.9 mm. Filaments equal, equaling to slightly longer than perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones triangular. Ovary obovoid-globose, without concave nectaries at base. Style longer than ovary, exserted. Fl. Jul.

• Slopes; 2100–2500 m. WC Hebei (Huailai Xian, Xiaowutai Shan).

67. *Allium spurium* G. Don, *Mem. Wern. Nat. Hist. Soc.* 6: 59. 1827.

岩韭 yan jiu

Allium dauricum Frizen; *A. saxicola* Kitagawa.

Bulb solitary or paired, cylindrical to conical-cylindrical, 0.5–1.5 cm in diam., attached to a subterranean, normally not thick rhizome; tunic whitish gray, membranous, apex splitting.

Leaves narrowly linear, straight, shorter or longer than scape, (1.5–)2–4 mm wide, flat to convex-flat, fleshy, margin minutely scabrous, apex acute to gradually attenuate, truncate. Scape (20–)30–40 cm, terete, not angled, wingless, covered with leaf sheaths only at base. Spathe 2-valved, usually caducous, apex acuminate. Umbel laxly hemispheric, many flowered. Pedicels (2–)3–4 × as long as perianth, usually ebracteolate. Perianth whitish pink or rose pink to pink-lilac, lustrous; segments with red, fine midvein or without midvein, narrowly elliptic or oblong-elliptic, 4.5–5.5(–6) × 1.5–2 mm, apex truncate to acute; outer ones boat-shaped. Filaments subulate, subequal, slightly longer than perianth segments, connate at base and adnate to perianth segments; inner ones wider than outer. Ovary ovoid, without concave nectaries. Style exserted. Fl. Jul–Aug. $2n = 32$.

Saline meadows, steppes, sandy places, sometimes stony places and cliffs. Hebei, Heilongjiang, Jilin, Liaoning, E Nei Mongol [Mongolia, Russia].

Allium spurium, *A. spirale*, and *A. senescens* are closely related taxa, and have been united under the name *A. senescens* in treatments in other floras, e.g., FRPS and Fl. URSS.

68. *Allium spirale* Willdenow, Enum. Pl., Suppl. 17. 1814.

扭叶韭 niu ye jiu

Allium austrosibiricum Frizen; *A. burjaticum* Frizen; *A. glaucum* Schrader ex Poiret.

Bulbs clustered, conical-cylindric, 0.5–1.5 cm in diam., attached to a subterranean, horizontal rhizome; tunic grayish white to yellowish brown or pale lilac-gray, membranous or scarious, usually entire. Leaves linear, spirally tortuous, shorter than scape, 4–6 mm wide, flat, main veins and margins minutely scabrous-denticulate, rarely smooth, apex obtuse. Scape (15–)20–40 cm, terete, subangular, narrowly 2-winged beneath umbel, covered with leaf sheaths only at base. Spathe 2-valved, persistent, apex acuminate. Umbel usually hemispheric, many flowered. Pedicels 1.5–2 × as long as perianth, ebracteolate or a few with a small bracteoles. Perianth pink to pale red; segments with dark red midvein, oblong ovate, 3.5–5.5 × 2–2.5 mm, apex obtuse, sometimes with unequal, very small denticles; outer ones boat-shaped, shorter than inner. Filaments subequal, usually subequaling to slightly longer than perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones narrowly triangular. Ovary broadly ovoid, without concave nectaries. Style exserted. Fl. Jul–Aug. $2n = 16, 32$.

Dry slopes, steppes, stony and gravelly places, sands and loess. Gansu, Hebei, Heilongjiang, N Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shanxi [N Korea, Mongolia, Russia].

69. *Allium senescens* Linnaeus, Sp. Pl. 1: 299. 1753.

山韭 shan jiu

Allium baicalense Willdenow; *A. senescens* f. *albiflorum* Q. S. Sun.

Bulb solitary or paired, ovate-cylindric or conical, 1–2 cm in diam., attached to a horizontal or oblique rhizome, sometimes developed above ground; outer tunic usually blackish gray or black, scarious, entire or slightly splitting. Leaves

spirally arranged, never distichous, broadly linear, sometimes slightly falcate, shorter than scape, 7–10(–12) mm wide, flat, thick, smooth or minutely scabrous, apex obtuse. Scape (25–)30–60 cm, 2-angled or narrowly 2-winged, covered with leaf sheaths only at base. Spathe 2-valved, persistent, apex acuminate. Umbel hemispheric to globose, many flowered. Pedicels equal, 2–3 × as long as perianth, a few bracteolate. Perianth pink to pale red, later becoming whitish; segments subovate, 4–6(–7) × 2–2.5 mm, apex obtuse, sometimes minutely denticulate; outer ones boat-shaped. Filaments subequal, to 1.5 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones narrowly triangular. Ovary globose, without concave nectaries. Style long exserted. Fl. Jul–Aug. $2n = 16^*, 32^*, (40), 48$.

Forests, dry stony slopes, steppes, saline meadows, gravelly places; 500–800 m. Heilongjiang, Jilin, Liaoning, Nei Mongol, N Xinjiang [Korea, Mongolia, Russia].

70. *Allium nutans* Linnaeus, Sp. Pl. 1: 299. 1753.

齿丝山韭 chi si shan jiu

Bulb solitary or paired, narrowly cylindric to subconical, 1.5–2 cm in diam., attached to a horizontal or oblique, stout rhizome; tunic blackish, membranous, ± entire. Leaves broadly linear, subfalcate, ca. 1/2 as long as scape, 6–10(–15) mm wide, flat, thick, smooth, apex obtuse. Scape 30–60 cm, 2-angled, narrowly 2-winged, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel globose, densely many flowered. Pedicels subequal, 2–3 × as long as perianth, bracteolate. Perianth pale red to pale purple; outer segments narrowly ovate, boat-shaped, 4.5–5.5 × 1.5–2 mm; inner ones ovate, 5–6.5 × 2.2–3 mm, apex obtuse. Filaments subequal, 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base for 2.5–3 mm, 1-toothed on each side. Ovary oblong-globose, without concave nectaries at base. Style exserted. Fl. and fr. Jun–Aug. $2n = 16, 17, 24, 28, 32^*, 44, 48^*, 56, 64^*, 72^*$.

Meadows, damp places. N Xinjiang (Altay Shan) [Kazakstan, Mongolia, Russia].

71. *Allium obliquum* Linnaeus, Sp. Pl. 1: 296. 1753.

高亭韭 gao ting jiu

Bulb solitary, ovoid-cylindric, 2–3 cm in diam.; tunic pale brown to brown, hard, leathery, entire. Leaves broadly linear, shorter than scape, 5–20 mm wide, gradually attenuate toward apex. Scape 60–100 cm, terete, covered with leaf sheaths for ca. 1/2 its length. Spathe 1- or 2-valved, persistent; beak short. Umbel globose, densely many flowered. Pedicels subequal, 2–4 × as long as perianth, bracteolate. Perianth pale yellow to greenish yellow; outer segments oblong to oblong-ovate, 4–5 × 1.5–2 mm; inner ones ovate, 4.5–5.5 × 2–2.5 mm. Filaments subulate, equal, ca. 1.5 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary ovoid, with concave nectaries covered by hoodlike projections at base. Style exserted. Fl. and fr. Jun–Jul. $2n = 16$.

Forests, meadows. NW Xinjiang [Kazakstan, Kyrgyzstan, Mon-

golia, Russia; E Europe].

72. *Allium hymenorhizum* Ledebour, Fl. Altaic. 2: 12. 1830.

北疆韭 bei jiang jiu

Bulb solitary or clustered, subcylindric, ca. 1.5 cm in diam.; tunic red-brown, lustrous, leathery, splitting. Leaves linear, shorter than scape, 2–6 mm wide, flat, smooth. Scape 30–90 cm, terete, covered with leaf sheaths for ca. 1/2 its length. Spathe 1-valved, persistent or deciduous. Umbel hemispheric to globose, densely many flowered. Pedicels subequal, 1.5–2 × as long as perianth, ebracteolate. Perianth pale red to purple-red; outer segments lanceolate to elliptic-lanceolate, 4–4.5 × 1.1–1.2 mm; inner ones narrowly oblong-elliptic, 4.6–5.5 × 1.3–1.6 mm. Filaments subulate, 1.25–1.5 × as long as perianth segments, connate at base and adnate to perianth segments; inner ones entire or 1-toothed on each side at base. Ovary obovoid to subglobose, with concave nectaries at base. Style exserted. Fl. Aug.

Meadows, dry pastures, high plains, mountain slopes; 1100–2700 m. N and W Xinjiang [Kazakstan, Kyrgyzstan, Mongolia, Russia, Tajikistan].

- 1a. Inner filaments entire 72a. var. *hymenorhizum*
- 1b. Inner filaments 1-toothed on each side at base 72b. var. *dentatum*

72a. *Allium hymenorhizum* var. *hymenorhizum*

北疆韭(原变种) bei jiang jiu (yuan bian zhong)

Allium macrorrhizum Boissier (1854), not *A. macrorrhizon* Regel (1875).

Inner filaments entire. Fl. Aug.

Meadows, high plains, mountain slopes; 1100–2700 m. N Xinjiang [Kazakstan, Kyrgyzstan, Mongolia, Russia, Tajikistan].

72b. *Allium hymenorhizum* var. *dentatum* J. M. Xu in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 285. 1980.

旱生韭 han sheng jiu

Inner filaments 1-toothed on each side at base. Fl. Aug.

• Dry pastures, plains; 1100–1700 m. N and W Xinjiang (Fuyun Xian, Zhaosu Xian).

73. *Allium kaschianum* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 10: 338. 1887.

草地韭 cao di jiu

Bulbs clustered, cylindric, 0.5–1(–1.5) cm in diam.; tunic brown, thinly leathery, usually lacinate. Leaves narrowly linear, slightly shorter to longer than scape, 1–1.5(–3) mm wide, scabrous-denticulate at margin. Scape 15–40 cm, terete, covered with leaf sheaths for 1/4–1/2 its length. Spathe 1- or 2-valved, persistent. Umbel hemispheric to globose, usually densely many flowered. Pedicels subequal, shorter than to equaling perianth, ebracteolate. Perianth pale purple; segments narrowly oblong to narrowly obovate-oblong, 3–5 × 1–1.8 mm, apex obtuse or retuse; inner ones slightly longer than outer. Filaments equal, subulate, ca. 1.5 × as long as perianth seg-

ments, connate at base and adnate to perianth segments. Ovary globose, without concave nectaries at base. Style much longer than ovary, exserted. Fl. and fr. Jul–Sep.

Meadows, gravelly plains, slopes; 2400–3000 m. NW Xinjiang [Kazakstan, Kyrgyzstan].

74. *Allium carolinianum* Redouté, Liliac. 2: t. 101. 1804.

镰叶韭 lian ye jiu

Allium aitchisonii Baker (1882), not Regel (1879); *A. obtusifolium* Klotzsch; *A. platyspathum* Schrenk var. *falcatum* Regel; *A. platystylum* Regel; *A. polyphyllum* Karelín & Kirilov; *A. thomsonii* Baker.

Bulbs usually paired, ovoid to ovoid-cylindric, 1–2.5 cm in diam.; tunic brown to yellowish brown, leathery, apex separated, usually fibrous. Leaves broadly linear, usually falcate, shorter than scape, (3–)5–15 mm wide, flat, smooth, apex obtuse. Scape 20–40(–60) cm, terete, covered with leaf sheaths for ca. 1/2 its length. Spathe 2-valved, persistent. Umbel globose, densely many flowered. Pedicels subequal, slightly shorter than to 2 × as long as perianth, bracteolate or ebracteolate. Perianth pale red to purple-red or white; segments oblong to narrowly so, (4.5–)6–8(–9.4) × 1.5–3 mm, apex obtuse, sometimes retuse; inner ones subequaling to slightly longer than outer. Filaments subulate, slightly shorter than to 2 × as long as perianth segments, connate at base and adnate to perianth segments for ca. 1 mm; inner ones wider than outer at base. Ovary subglobose, with concave nectaries at base. Style exserted. Fl. and fr. Jun–Sep. 2n = 32.

Gravelly or stony slopes; 3000–5000 m. Xinjiang, N and W Xizang [Afghanistan, ?Bhutan, India, Kazakstan, Kyrgyzstan, W Nepal, Pakistan, Tajikistan, Uzbekistan].

75. *Allium blandum* Wallich, Pl. Asiat. Rar. 3: 38. 1832.

白韭 bai jiu

Bulb usually solitary, rarely paired, narrowly ovoid, 1.5–2 cm in diam.; tunic brown, leathery, usually entire. Leaves broadly linear, shorter than scape, (5–)7–10 mm wide, flat, smooth, apex obtuse or gradually attenuate to obtuse tip. Scape 25–30 cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, membranous, persistent; beak very short. Umbel globose, densely many flowered. Pedicels subequal, usually subequaling perianth, ebracteolate or a few bracteolate. Perianth pinkish red; segments oblong, 5.5–7 mm, apex obtuse. Filaments subulate, equal, ca. 2 × as long as perianth segments, not connate but slightly adnate to base of perianth segments; inner ones not broadened at base. Ovary subglobose, with concave nectaries at base. Style exserted. Fl. and fr. Jul–Aug.

Moist slopes in high mountains; 3500–5000 m. NW Xinjiang [Afghanistan, India, Pakistan, Tajikistan].

76. *Allium phariense* Rendle, J. Bot. 44: 42. 1906.

帕里韭 pa li jiu

Bulb solitary or in clusters of 2 or 3, narrowly ovoid, 0.7–1.5 cm in diam.; tunic grayish black, membranous or papery, entire or apex separated. Leaves linear, falcate, equaling to slightly longer than scape, rarely shorter, 2–5(–7) mm wide, flat.

Scape usually nodding distally, 6–15 cm, terete, covered with leaf sheaths only at base. Spathe 1- or 2-valved, persistent. Umbel globose, densely many flowered. Pedicels subequal, 1.5–2 × as long as perianth, ebracteolate. Perianth white; segments with purple midvein when dried, narrowly ovate to obovate-oblong, 4.5–6 × 2–2.5 mm; inner ones sometimes slightly longer and narrower than outer, apex obtuse, sometimes slightly retuse. Filaments subulate, equal, 1.25–1.5 as long as perianth segments, connate at base and adnate to perianth segments for ca. 1 mm. Ovary subglobose, without concave nectaries at base. Style exerted. Fl. and fr. Jul–Aug.

Meadows, gravelly slopes; 4400–5200 m. NW Sichuan (Dêgê Xian), S Xizang [Bhutan].

77. *Allium platyspathum* Schrenk, Enum. Pl. Nov. 1: 7. 1841.

宽苞韭 kuan bao jiu

Bulb solitary or rarely paired, cylindrical to ovoid-cylindrical, 1–2 cm in diam.; tunic blackish gray to black, thinly papery, decaying quickly; inner layers grayish lilac or light pinkish white, membranous. Leaves broadly linear, shorter to slightly longer than scape, 2–17 mm wide, flat, apex obtuse or gradually acute. Scape 10–60(–100) cm, terete, covered with leaf sheaths only at base or for 1/3–1/2 its length. Spathe 2-valved, persistent; beak very short. Umbel hemispheric to globose, densely many flowered. Pedicels subequal, equaling to 2 × as long as perianth, ebracteolate. Perianth pink or pinkish lilac; segments lanceolate to linear-lanceolate, 6–8 × 1.5–2 mm; inner ones slightly longer than outer. Filaments 1–1.5 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary subglobose, with concave nectaries at base. Style exerted. Fl. and fr. Jun–Aug. *2n* = 16.

Forest margins, subalpine or alpine meadows, stony slopes, river shores; 1900–3700 m. Xinjiang [Afghanistan, Kazakstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Uzbekistan].

- 1a. Scape to 25 cm, covered with leaf sheaths only at base; leaves 2–7 mm wide; perianth pinkish lilac, segments (5–)6–8 mm 77a. subsp. *platyspathum*
- 1b. Scape (35–)40–70(–100) cm, covered with leaf sheaths for 1/3–1/2 its length; leaves 10–17 mm wide; perianth rose pink, segments 7–8 mm 77b. subsp. *amblyophyllum*

77a. *Allium platyspathum* subsp. *platyspathum*

宽苞韭(原亚种) kuan bao jiu (yuan ya zhong)

Leaves 2–7 mm wide. Scape to 25 cm, covered with leaf sheaths only at base. Perianth pinkish lilac; segments (5–)6–8 mm. Fl. Jul–Aug.

Alpine meadows, stony slopes; 2700–3700 m. Xinjiang [Afghanistan, Kazakstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Uzbekistan].

77b. *Allium platyspathum* subsp. *amblyophyllum* (Karelin & Kirilov) Frizen in Malyshev & Peschkova, Fl. Sibir. 4: 81. 1987.

钝叶韭 dun ye jiu

Allium amblyophyllum Karelin & Kirilov, Bull. Soc. Imp.

Naturalistes Moscou 15: 510. 1842; *A. alataviense* Regel.

Leaves 10–17 mm wide. Scape (35–)40–70(–100) cm, covered with leaf sheaths for 1/3–1/2 its length. Perianth rose pink; segments 7–8 mm. Fl. Jun–Jul.

Forest margins, subalpine meadows, river shores; 1900–2500 m. Xinjiang [Kazakstan, Kyrgyzstan, Mongolia, Russia].

78. *Allium rude* J. M. Xu in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 286. 1980.

野黄韭 ye huang jiu

Bulb solitary, cylindrical, sometimes narrowly ovoid-cylindrical, 0.5–1(–1.5) cm in diam.; tunic brown to pale brown, thinly leathery, splitting. Leaves linear, sometimes slightly falcate, shorter than to subequaling scape, 3–10 mm wide, flat. Scape 20–70 cm, terete, covered with leaf sheaths only at base. Spathe 2- or 3-valved, persistent. Umbel globose, densely many flowered. Pedicels 1–1.5 × as long as perianth, ebracteolate. Perianth pale yellow to greenish yellow; segments oblong-elliptic to oblong-ovate, 5–6 × 2–2.5(–3) mm; inner ones sometimes slightly longer than outer. Filaments subulate, equal, 1.25–1.35 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary ovoid to ovoid-globose, with concave nectaries covered by short, hoodlike projections at base. Style exerted. Fl. and fr. Jul–Sep.

• Damp slopes, meadows; 2700–5000 m. S Gansu, SE Qinghai, W Sichuan, E Xizang.

79. *Allium chrysocephalum* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 10: 335. 1887.

折被韭 zhe bei jiu

Bulb solitary, cylindrical, sometimes thickened at base, 0.5–1 cm in diam.; tunic pale brown to brown, thinly leathery, apex lacinate. Leaves linear to broadly so, slightly falcate, usually ca. 1/2 as long as or rarely subequaling scape, 3–10 mm wide, flat. Scape 5–25 cm, terete, covered with leaf sheaths only at base. Spathe 2- or 3-valved, persistent. Umbel hemispheric to globose, densely many flowered. Pedicels subequaling to slightly longer than perianth, ebracteolate. Perianth bright yellow; outer segments oblong-ovate, boat-shaped, 5.5–6.5 × 2.2–3 mm; inner ones oblong-lanceolate, 7–8 × 2–2.7 mm, apex recurved. Filaments subulate, ca. 2/3 as long as inner perianth segments, connate at base and adnate to perianth segments for ca. 1 mm. Ovary ovoid to ovoid-globose, with concave nectaries at base. Style not exerted. Fl. and fr. Jul–Sep.

• Damp slopes, meadows; 3400–4800 m. Gansu, Qinghai, NW Sichuan.

80. *Allium herderianum* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 10: 324. 1887.

金头韭 jin tou jiu

Bulb solitary, ovoid-globose to ovoid, 1–1.5 cm in diam.; tunic grayish brown, thinly leathery, apex splitting or lacinate. Leaves subequaling scape, 2–4 mm wide. Scape (12–)20–40 cm, terete, covered with leaf sheaths only at base. Spathe 2- or 3-valved, persistent. Umbel hemispheric to globose, densely

many flowered. Pedicels subequal, equaling to slightly longer than perianth, ebracteolate. Perianth pale to bright yellow; outer segments oblong-ovate, boat-shaped, 5–6 × 2.5–3 mm; inner ones oblong-lanceolate, 7–8 × 2–2.5 mm, apex recurved. Filaments subulate, 1/2–2/3 as long as inner perianth segments, connate at base and adnate to perianth segments for ca. 1 mm. Ovary ovoid, with concave nectaries at base. Style not exerted. Fl. and fr. Jul–Sep.

• Sunny slopes, dry plains; 2900–3900 m. Gansu, Qinghai.

81. *Allium saxatile* Marschall von Bieberstein, Tabl. Prov. Mer. Casp. 114. 1798.

长喙韭 chang hui jiu

Allium caucasicum Marschall von Bieberstein; *A. dshungaricum* Vvedensky; *A. globosum* Marschall von Bieberstein ex Redouté; *A. gmelinianum* Misczenko ex Grossheim; *A. stevenii* Ledebour.

Bulbs usually clustered, ovoid-cylindric, 0.7–1.5 cm in diam.; tunic brown to red-brown, leathery, entire or splitting. Leaves shorter than scape, 0.5–1.5 mm wide, semiterete, adaxially channeled, smooth, sometimes scabrous-denticulate along angles. Scape 20–60 cm, terete, solid, smooth, covered with leaf sheaths for ca. 1/3 its length; outermost leaf sheath usually scabrous. Spathe 1- or 2-valved, persistent; beak ca. 2 × as long as limb, sometimes to 6 cm. Umbel globose, densely many flowered. Pedicels subequal, 1.5–2(–4) × as long as perianth, elongate in fruit, bracteolate. Perianth purple-red to pale red, rarely white; segments with darker midvein, oblong-ovate, 4–5 × 2–2.5 mm, apex shortly pointed; inner ones slightly longer than outer. Filaments subulate, equal, 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary subglobose, with concave nectaries at base. Style exerted. Fl. and fr. Jul–Sep. $2n = 16, 32$.

Dry slopes; 1100–3100 m. Xinjiang (Altay Shan, Tarbagatay Shan, Tian Shan) [Kazakhstan, Russia; C Europe].

82. *Allium kurssanovii* M. Popov, Bjull. Moskovsk. Obshch. Isp. Prir., Otd. Biol., 47: 85. 1938.

条叶长喙韭 tiao ye chang hui jiu

Allium pseudoglobosum M. Popov ex Gamajunova.

Bulbs clustered, cylindric to cylindric-ovoid, very long, 10–15 × 2–3 cm; tunic dark brown, hard, leathery, entire or splitting. Leaves linear, slightly shorter or longer than scape, 3–4 mm wide, flat, margin smooth, rarely scabrous. Scape 50–70(–90) cm, terete, smooth, covered with leaf sheaths for ca. 1/2 its length. Spathe 2-valved, persistent; beak ca. 2 × as long as limb. Umbel globose, 2–3 cm in diam., many flowered. Pedicels equal, to 2 × as long as perianth, bracteolate. Perianth pink-lilac to dark violet-red; segments with dark purple midvein, oblong-ovate, 3.5–4 mm, apex acute; inner ones ovate, apex truncate. Filaments subulate, 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary conical-subglobose. Style exerted.

Stony slopes, cliffs; 2200–2700 m. W Xinjiang (Tian Shan) [Kazakhstan, Kyrgyzstan].

83. *Allium caricoides* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 532. 1880.

石生韭 shi sheng jiu

Allium hoetzerei Regel.

Bulbs clustered, cylindric, 0.5–1 cm in diam.; tunic brown, leathery, apex entire or laciniate. Leaves 3 or 4, subequaling scape, 0.5–1(–1.5) mm wide, semiterete or subterete, adaxially channeled, margin ciliate-denticulate or scabrous-denticulate. Scape 5–20 cm, slender, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel hemispheric, densely flowered. Pedicels subequal, 0.5–1 × as long as perianth, bracteolate. Perianth pale red to pale purple; segments oblong to ovate, 3.5–5.8 × 1.5–2.5 mm, apex usually shortly pointed; inner ones slightly longer than outer. Filaments subulate, equal, 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary obovoid to subglobose, with concave nectaries covered by hoodlike projections at base. Style exerted. Fl. and fr. Jul–Aug.

Gravelly slopes, rock crevices; 1800–3300 m. Xinjiang (Tian Shan) [Kazakhstan, Kyrgyzstan].

84. *Allium petraeum* Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 15: 512. 1842.

石坡韭 shi po jiu

Bulbs clustered, narrowly conical to subcylindric, 0.8–1.5 cm in diam.; tunic grayish or yellowish white, thinly leathery to subpapery, splitting; inner layers pinkish lilac. Leaves slightly shorter than scape, 0.5–1 mm wide, semiterete, adaxially channeled, usually smooth. Scape (20–)30–50 cm, terete, smooth or scabrous, covered with leaf sheaths for 1/4–1/3 its length. Spathe persistent; beak 2–4 × as long as limb. Umbel globose, densely many flowered. Pedicels equal, ca. 1.5 × as long as perianth, bracteolate. Perianth pale to lemon yellow; segments with green or greenish pink midvein, oblong-ovate, ca. 4 mm, apex acute; inner ones slightly longer than outer. Filaments subulate, equal, ca. 1.5 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary subglobose, with small, concave nectaries at base. Style exerted. Fl. Jul. $2n = 16$.

Stony slopes, cliffs. NW Xinjiang [Kazakhstan].

85. *Allium tianschanicum* Ruprecht, Mém. Acad. Imp. Sci. Saint Pétersbourg, sér. 7, 14(4): 33. 1869.

天山韭 tian shan jiu

Allium globosum Marschall von Bieberstein ex Redouté var. *albidum* Regel; *A. hymenorhizum* Ledebour var. *tianschanicum* (Ruprecht) Regel; *A. macrorrhizon* Regel (1875), not *A. macrorrhizum* Boissier (1854).

Bulbs clustered, cylindric-conical to subcylindric, (0.8–)1–2 cm in diam.; tunic brown, thinly leathery, splitting. Leaves narrowly linear, usually shorter than scape, 1–1.5 mm wide, adaxially channeled, margin ciliate-denticulate. Scape 15–25 cm, terete, covered with leaf sheaths only at base. Spathe persistent; beak equaling limb. Umbel hemispheric to subglobose, usually densely many flowered. Pedicels equal,

slightly shorter to slightly longer than perianth, bracteolate. Perianth pale yellow or white and becoming red; segments ovate, 5–6 mm, apex obtuse; outer ones sometimes retuse at apex; inner ones ca. $1.2 \times$ as long as outer. Filaments subulate, equal, $1.25\text{--}1.5$ as long as perianth segments, connate at base and adnate to perianth segments. Ovary subglobose, with small, concave nectaries at base. Style exerted. Fl. and fr. Jul–Sep. $2n = 16$.

Scrub in subalpine zone, meadows. W Xinjiang [Kazakstan, Kyrgyzstan, Tajikistan].

86. *Allium megalobulbon* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 526. 1880.

大鳞韭 da lin jiu

Bulbs paired or clustered, cylindric, very long, to $10 \times 1\text{--}1.5$ cm; tunic yellowish brown, thinly leathery to papery, splitting; inner layers pinkish white. Leaves subulate to linear, $1\text{--}2$ mm wide, semiterete to flat, margin scabrous-denticulate. Scape $25\text{--}35$ ($\text{--}40$) cm, terete, covered with leaf sheaths for ca. $1/4$ its length. Spathe thinly leathery; beak small. Umbel globose, densely many flowered. Pedicels subequal, shorter than perianth, bracteolate. Perianth rose pink, becoming whitish when dried; segments with red midvein, lanceolate, $5\text{--}6 \times 1.5\text{--}2$ mm, apex acute. Filaments ca. $1/2$ as long as perianth segments, base slightly broadened, connate and adnate to perianth segments, free part subulate. Ovary conical-ovoid, with concave nectaries at base. Style short, not exerted. Fl. Jul.

• Stony slopes. W Xinjiang (Borohoro Shan, Tian Shan).

87. *Allium pevtzovii* Prokhanov, Izv. Glavn. Bot. Sada SSSR 29: 561. 1930.

昆仑韭 kun lun jiu

Bulbs clustered, cylindric; tunic brown, thinly leathery, \pm entire. Leaves linear, equaling to slightly longer than scape, $2\text{--}3$ mm wide, subfistulose. Scape $20\text{--}25$ cm, terete, fistulose, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbel hemispheric, densely many flowered. Pedicels subequal, slightly shorter than to equaling perianth, ebracteolate. Perianth pale red, lustrous; segments linear-lanceolate, $6\text{--}8 \times 1\text{--}2$ mm, apex acuminate with a reflexed point. Filaments equal, ca. $2/3$ as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones ovate at base, 1-toothed on each side. Ovary with concave nectaries at base. Style not exerted. Fl. and fr. Jun–Jul.

• Slopes; $1300\text{--}1400$ m. SW Xinjiang (Kunlun Shan, Yecheng Xian).

88. *Allium korolkowii* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 3(2): 158. 1875.

褐皮韭 he pi jiu

Allium moschatum Linnaeus var. *brevipedunculatum* Regel; *A. moschatum* var. *dubium* Regel; *A. oliganthum* Karelin & Kirilov var. *elongatum* Karelin & Kirilov.

Bulb solitary or clustered, ovoid, $0.5\text{--}1$ cm in diam.; tunic brown, sometimes lustrous, leathery, prominently reticulate veined, apex fibrous or subreticulate. Leaves $2\text{--}4$, much shorter

than scape, ca. 0.5 mm wide, semiterete, adaxially channeled, smooth or scabrous along ribs. Scape $10\text{--}30$ cm, terete, covered with leaf sheaths for ca. $1/3$ its length. Spathe 2-valved, persistent; beak $1/3\text{--}1/2$ as long as limb. Umbel nearly hemispheric, few flowered. Pedicels unequal, especially in fruit, $2\text{--}3 \times$ as long as perianth, bracteolate. Perianth white to pinkish white or pale red; segments with purple midvein, oblong-lanceolate, equal, $5\text{--}6.5 \times 1.2\text{--}1.8$ mm, apex shortly pointed. Filaments equal, $1/2\text{--}2/3 \times$ as long as perianth segments, connate at base and adnate to perianth segments for $1/4\text{--}1/3$ their length; outer ones triangular; inner ones ca. $2 \times$ as wide as outer at base and abruptly subulate distally. Ovary ovoid, with concave nectaries covered by hoodlike projections at base. Style not exerted. Fl. and fr. Jul–Aug.

Dry slopes, basins, river shores; $1500\text{--}2500$ m. Xinjiang (Tian Shan) [Kazakstan, Kyrgyzstan].

89. *Allium setifolium* Schrenk, Enum. Pl. Nov. 1: 6. 1841.

丝叶韭 si ye jiu

Bulbs clustered, narrowly ovoid to ovoid-cylindric, $0.5\text{--}1$ cm in diam.; tunic usually 1-valved, pale brown, leathery, entire or splitting, apex lacinate. Leaves 2 or 3, hairlike, shorter than to subequaling scape, $0.2\text{--}0.3$ mm wide. Scape $5\text{--}10$ cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent; beak very short. Umbel laxly few flowered. Pedicels subequal, $1\text{--}2 \times$ as long as perianth, bracteolate. Perianth pale red to red; segments with purple midvein, lanceolate to oblong-lanceolate, $5\text{--}7 \times 1.2\text{--}1.6$ mm, apex obtuse. Filaments subequal, ca. $2/3$ as long as perianth segments, connate at base and adnate to perianth segments for $1/3\text{--}1/2$ their length, base triangular, free part subulate; inner ones wider than outer. Ovary ellipsoid-globose, with concave nectaries covered by hoodlike projections at base. Style not exerted. Fl. and fr. Jun–Aug. $2n = 16$.

Calcareous slopes, deserts; $400\text{--}1000$ m. NW Xinjiang [Kazakstan, Kyrgyzstan, Mongolia].

90. *Allium subtilissimum* Ledebour, Fl. Altaic 2: 22. 1830.

蜜囊韭 mi nang jiu

Bulbs clustered, narrowly ovoid-cylindric to narrowly conical, $0.5\text{--}0.6$ ($\text{--}1$) cm in diam.; tunic grayish brown or gray, slightly tinged with red, membranous to thinly scarious, entire or splitting at apex. Leaves $3\text{--}5$, usually shorter than scape, ca. 0.5 mm wide, slender, subterete, adaxially channeled. Scape $5\text{--}20$ cm, terete, covered with leaf sheaths for ca. $1/4$ its length. Spathe 2-valved, persistent; beak equaling limb. Umbel laxly few flowered. Pedicels subequal, $2\text{--}3$ ($\text{--}4$) \times as long as perianth, bracteolate. Perianth pale red to pale purple-red; segments with purple midvein; outer ones ovate-elliptic, boat-shaped, $3\text{--}4.5 \times 1.2\text{--}1.8$ mm, apex shortly pointed; inner ones oblong-elliptic, $3.8\text{--}5 \times 1.5\text{--}2.1$ mm, apex obtuse or shortly pointed. Filaments equal, slightly longer than perianth segments, rarely slightly shorter, connate at base and adnate to perianth segments. Ovary subglobose, with longitudinally convex nectaries along septa; nectary pit at ovary base open. Style exerted. Fl. Jul–Aug. $2n = 16$.

Dry stony slopes, cliffs, gravelly saline places along rivers; 700–1500 m. SW Nei Mongol (Longshou Shan), NW Xinjiang [Kazakhstan, Mongolia, Russia].

91. *Allium longistylum* Baker, J. Bot. 12: 294. 1874.

长柱韭 *chang zhu jiu*

Allium hopeiense Nakai; *A. jeholense* Franchet.

Bulbs usually clustered, cylindrical, 0.4–0.8 cm in diam.; tunic red-brown, lustrous, scarious to subleathery, lacinate. Leaves subequaling to slightly longer than scape, 2–3 mm wide, adaxially channeled. Scape (10–)30–50 cm, terete, covered with leaf sheaths only at base. Spathe 3-valved. Umbel globose, many flowered or sometimes few flowered. Pedicels 1–3 × as long as perianth, bracteolate. Perianth red to purple-red; outer segments oblong, 3.5–4.5 × 1.8–2.3 mm; inner ones ovate, 4–5 × 2–2.5 mm. Filaments subulate, equal, ca. 2 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary obovoid, with concave nectaries covered by hood-like projections at base. Style exserted. Fl. and fr. Aug–Sep.

• Slopes, plains; 1500–3000 m. Hebei, Nei Mongol (Daqing Shan), Shanxi.

92. *Allium alabasicum* Y. Z. Zhao, Acta Sci. Nat. Univ. Intra-mongol. 23: 555. 1992.

鄂尔多斯韭 *e er duo si jiu*

Bulbs clustered, cylindrical; tunic brown, fibrous. Leaves conspicuously longer than scape, ca. 0.3 mm wide, semiterete or terete. Scape 3–5 cm, ± terete, usually 2-angled, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbel usually 4- or 5-flowered. Pedicels subequal, 1.5–2 × as long as perianth, ebracteolate. Perianth purple-red; segments ovate-oblong, 3–3.5 × ca. 2 mm, apex obtuse; inner ones slightly longer than outer. Filaments subequaling perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones triangular-ovate for ca. 1/4 their length. Ovary ovoid-globose, with concave nectaries covered by hoodlike projections at base. Style not exserted. Fl. Aug.

• Dry slopes. Nei Mongol (Arbas Shan).

93. *Allium condensatum* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 27(2): 121. 1854.

黄花韭 *huang hua jiu*

Bulb usually solitary, rarely paired, narrowly ovoid-cylindrical to subcylindrical, 1–2(–2.5) cm in diam.; tunic red-brown, lustrous, thinly leathery, lacinate. Leaves shorter than scape, 1–2.5 mm wide, terete to semiterete, fistulose, adaxially channeled. Scape 30–80 cm, terete, solid, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel globose, densely many flowered. Pedicels subequal, 2–4 × as long as perianth, ebracteolate. Perianth pale yellow to white; segments ovate-oblong, 4–5 × 1.8–2.2 mm; inner ones slightly longer. Filaments subulate, equal, 1/4–1/2 as long as perianth segments, connate at base and adnate to perianth segments. Ovary obovoid, with concave nectaries covered by hoodlike projections at

base. Style exserted. Fl. and fr. Jul–Sep. $2n = 16^*$.

Slopes, meadows; near sea level to 2000 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shandong, Shanxi [Korea, Mongolia, Russia].

94. *Allium xichuanense* J. M. Xu in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 285. 1980.

西川韭 *xi chuan jiu*

Bulb solitary, ovoid or narrowly so to ovoid-cylindrical, 0.8–1.2 cm in diam.; tunic pale brown to brown, thinly leathery, splitting. Leaves equaling to slightly longer than scape, 1.5–4 mm wide, semiterete to semiterete-angled, fistulose. Scape (10–)20–40 cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel globose, densely many flowered. Pedicels equal, 1–1.5 × as long as perianth, ebracteolate. Perianth pale yellow to greenish yellow; segments oblong-elliptic to oblong-ovate, 5–6 × 2–2.5(–3) mm; inner ones sometimes slightly longer than outer. Filaments equal, equaling to 1.3 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary ovoid-globose, with concave nectaries covered by short, hoodlike projections at base. Style exserted. Fl. and fr. Aug–Oct.

• Slopes, meadows; 3100–4400 m. W Sichuan, NW Yunnan.

95. *Allium chrysanthum* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 3(2): 91. 1875.

野葱 *ye cong*

Bulb cylindrical to narrowly ovoid-cylindrical, 0.5–1(–1.5) cm in diam.; tunic red-brown to brown, thinly leathery, usually lacinate. Leaves shorter than scape, 1.5–4 mm wide, terete, fistulose. Scape 20–50 cm, terete, fistulose, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel globose, densely many flowered. Pedicels subequal, slightly shorter than to 1.5 × as long as perianth, ebracteolate. Perianth yellow to pale yellow; segments ovate-oblong, 5–6.5 × 2–3 mm; inner ones slightly longer than outer. Filaments subulate, equal, 1.3–2 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary obovoid, without concave nectaries at base. Style exserted. Fl. and fr. Jul–Sep. $2n = 16^*$.

• Slopes, plains; 2000–4500 m. Gansu, W Hubei, E Qinghai, S Shaanxi, Sichuan, SE Xizang, NW Yunnan.

96. *Allium altaicum* Pallas, Reise Russ. Reich. 2: 737. 1773.

阿尔泰葱 *a er tai cong*

Allium ceratophyllum Besser ex Schultes & J. H. Schultes; *A. sapidissimum* Pallas ex Schultes & J. H. Schultes.

Bulb solitary, ovoid-cylindrical, 2–4 cm in diam.; tunic red-brown, thinly leathery or hard and leathery, entire or outer layer splitting. Leaves 1/3–1/2 as long as scape, 0.5–2 cm wide, terete, fistulose. Scape 40–100 cm, terete, fistulose, covered with leaf sheaths for 1/4–1/2 its length. Spathe 2-valved, persistent. Umbel globose, densely many flowered. Pedicels subequal, slightly shorter than to 1.5(–2) × as long as perianth, stout, ebracteolate. Perianth white tinged with yellow; outer segments ovate 6–9 × 2.8–4 mm, apex acute or acuminate; inner ones

ovate-oblong, equaling or slightly longer than outer. Filaments subulate, equal, 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary obovoid, with narrow, concave nectaries at base. Style exserted. Fl. and fr. Aug–Sep. 2n = 16*.

Slopes, plains. W Heilongjiang, Nei Mongol, N Xinjiang [Kazakhstan, Mongolia, Russia].

97. *Allium fistulosum* Linnaeus, Sp. Pl. 1: 301. 1753.

葱 cong

Bulb solitary or clustered, cylindrical, rarely ovoid-cylindrical, 1–2(–4.5) cm in diam.; tunic white, rarely pale red-brown, membranous to thinly leathery, entire. Leaves subequaling scape, 0.5–1.5 cm wide. Scape 30–50(–100) cm, terete, fistulose, covered with leaf sheaths for ca. 1/3 its length. Spathe 2-valved, persistent. Umbel globose, many flowered. Pedicels subequal, slender, 1–3 × as long as perianth, ebracteolate. Perianth white; segments ovate, 6–8.5 × 2.5–3 mm, apex acuminate, with a reflexed point; inner ones slightly longer than outer. Filaments equal, 1.5–2 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary obovoid, with inconspicuous nectaries at base. Style exserted. Fl. and fr. Apr–Aug. 2n = 16*.

Cultivated as a vegetable since ancient times [possibly native to W China, but no wild plants have been collected; widely cultivated elsewhere].

98. *Allium cepa* Linnaeus, Sp. Pl. 1: 300. 1753.

洋葱 yang cong

Bulb solitary or clustered, applanate-globose to cylindrical-ovoid; tunic purple-red, brown-red, pale brown-red, or yellow to pale yellow, papery to thinly leathery, entire. Leaves shorter than scape, 0.5–2 cm wide, terete, fistulose. Scape developed or not, if developed then to 1 m, terete, conspicuously inflated below middle, fistulose, covered with leaf sheaths only at base. Spathe 2- or 3-valved, persistent. Umbel globose, densely many flowered or with bulblets and a few flowers. Pedicels equal, ca. 5 × as long as perianth, bracteolate. Perianth chalk white or white; segments with green or pale red midvein, oblong-ovate, 4–5 × ca. 2 mm. Filaments equal, slightly longer than perianth segments, connate at base for ca. 1/5 their length, adnate to perianth segments for 1/2 of connate part; outer ones subulate; inner ones broadened at base, 1-toothed on each side. Ovary subglobose, with concave nectaries covered by hoodlike projections at base. Style slightly exserted. Fl. and fr. May–Jul. 2n = 16*, 32.

Cultivated as a vegetable. Throughout China [widely cultivated elsewhere].

- 1a. Bulbs clustered; scape not developed (plants propagated by bulbs) 98c. var. *aggregatum*
- 1b. Bulb solitary; scape developed (plants propagated by seeds or bulblets).
 - 2a. Umbel without bulblets; perianth chalk white, segments with green midvein 98a. var. *cepa*
 - 2b. Umbel with bulblets; perianth white, segments with pale red midvein

..... 98b. var. *proliferum*

98a. *Allium cepa* var. *cepa*

洋葱(原变种) yang cong (yuan bian zhong)

Bulb solitary, applanate globose to subglobose. Scape developed. Umbel without bulblets. Perianth chalk white; segments with green midvein. Fl. and fr. May–Jul. 2n = 16*, 32.

Cultivated as a vegetable. Throughout China [widely cultivated elsewhere].

98b. *Allium cepa* var. *proliferum* (Moench) Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 3(2): 93. 1875.

楼子葱 lou zi cong

Cepa prolifera Moench, Methodus, 244. 1794; *Allium proliferum* (Moench) Schrader ex Willdenow.

Bulb solitary, ovoid to oblong-ovoid. Scape developed. Umbel with many bulblets and few flowers, bulblets leafing on umbel. Perianth white; segments with pale red midvein.

Cultivated as a vegetable. Gansu, Hebei, Henan, Ningxia, Shaanxi, Sichuan [widely cultivated elsewhere].

The Chinese name 红葱 (hong cong) was given to this variety in FRPS. However, this name was also used for *Eleutherine plicata* Herbert in the Iridaceae.

98c. *Allium cepa* var. *aggregatum* G. Don, Mem. Wern. Nat. Hist. Soc. 6: 27. 1827.

火葱 huo cong

Bulbs clustered, narrowly ovoid or cylindrical-ovoid. Scape not developed (plants propagated by bulbs). 2n = 16.

Cultivated as a vegetable. Anhui, Fujian, Guangdong, Guangxi, Hainan, Henan, Hubei, Hunan, Jiangxi, Zhejiang [widely cultivated elsewhere].

The name *Allium ascalonicum* Linnaeus (Fl. Palaest. 17. 1756) has been persistently applied to this variety, although the type of *A. ascalonicum* belongs to a SW Asian species currently known as *A. hierochuntinum* Boissier (1882). *Allium ascalonicum* could be rejected to prevent the displacement of *A. hierochuntinum* for the SW Asian species, or it could be conserved with a conserved type to permit its traditional usage as well as to protect *A. hierochuntinum*. Article 57 of the ICBN would prevent any nomenclatural disruption for the time being.

99. *Allium cepiforme* G. Don, Mem. Wern. Nat. Hist. Soc. 6: 31. 1827

香葱 xiang cong

Allium ascalonicum Linnaeus var. *chinense* Kunth.

Bulb ovoid-globose to ovoid; tunic red-brown to yellowish brown, scarious, entire. Leaves deep green, narrower than those of *Allium cepa* and *A. fistulosum*, terete, fistulose. Scape usually not developed (plants propagated by bulbs), if developed then fistulose, inflated. Spathe 2- or 3(or 4)-valved. Umbel globose. Pedicels slender, longer than perianth. Perianth white; segments with green midvein, oblong, apex obtuse, sometimes with reflexed point. Filaments subulate, subequal, ca. 2 × as

long as perianth segments. $2n = 16$.

Cultivated. Mostly in E China, also Xinjiang [widely cultivated elsewhere].

Allium cepiforme originated in cultivation, probably as a result of hybridization between *A. cepa* and *A. fistulosum*.

100. *Allium galanthum* Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 15: 508. 1842.

实葶葱 shi ting cong

Allium pseudocepa Schrenk.

Bulbs clustered, cylindrical, slightly inflated at base, 1.5–3 cm in diam.; tunic brown-red, lustrous, thinly leathery, entire. Leaves 1/2–2/3 as long as scape, 3–10 mm wide, terete, fistulose. Scape (20–)30–60 cm, terete, solid, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel globose, densely many flowered. Pedicels equal, 2–4 × as long as perianth, bracteolate. Perianth white; segments oblong to ovate-oblong, 3.2–5 × 1.8–2.2 mm; outer ones slightly shorter than or equaling inner. Filaments slightly longer than perianth segments, rarely slightly shorter, connate at base for 1–1.3 mm, adnate to perianth segments for ca. 1/2 of connate part; outer ones subulate; inner ones broadened at base, 1-toothed on each side, rarely teeth inconspicuous. Ovary conical, with concave nectaries covered by hoodlike projections at base. Style not exerted. Fl. and fr. Aug–Oct. $2n = 16$.

Dry stony and gravelly slopes, cliffs, valleys; 500–1500 m. N Xinjiang [Kazakstan, Mongolia, Russia].

101. *Allium semenovii* Regel in Regel & Herder, Bull. Soc. Imp. Naturalistes Moscou 41(1): 449. 1868.

管丝葱 guan si cong

Allium tristylum Regel.

Bulb solitary or clustered, cylindrical, 0.5–1.5 cm in diam.; tunic dirty brown to dark gray, fibrous, usually subreticulate. Leaves broadly linear, often falcate, usually longer than scape, rarely shorter, 5–15 mm wide, often plicate. Scape 8–25(–50) cm, terete, covered with leaf sheaths for ca. 1/3 its length. Spathe 2-valved, persistent. Umbel ovoid-globose to globose, densely many flowered. Pedicels unequal; outer ones much shorter than perianth; inner ones subequaling or slightly longer than perianth, ebracteolate. Perianth yellow, becoming red to purple-red; segments lanceolate to ovate-lanceolate, 10–17 × 3–5 mm, margin sometimes irregularly denticulate, apex acuminate; inner ones slightly shorter than outer. Filaments 1/4–1/3 as long as perianth segments, connate for 3/5–4/5 their length, adnate to perianth segments for 1/3–1/2 of connate part; inner ones broadened at base, 1-toothed on each side. Ovary subglobose, with concave nectaries covered by hoodlike projections at base. Style shorter than ovary; stigma 3-cleft. Fl. and fr. May–Aug.

Forest margins, damp slopes, meadows; 2000–3000 m. Xinjiang (Tian Shan) [Kazakstan, Kyrgyzstan].

The specific epithet was misspelled as “*semenori*” in the protologue.

102. *Allium atosanguineum* Schrenk, Bull. Sci. Acad. Imp.

Sci. Saint-Petersbourg 10: 355. 1842.

蓝苞葱 lan bao cong

Bulb solitary or clustered, cylindrical, 0.5–1 cm in diam.; tunic grayish brown, lacinate, slightly fibrous. Leaves shorter than to subequaling scape, 2–4 mm wide, terete, fistulose. Scape 7–60 cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, blue, persistent. Umbel globose, densely many flowered. Pedicels unequal; outer ones usually shorter than perianth; inner ones usually longer than perianth, ebracteolate. Perianth purple-red, minutely black dotted, and later becoming yellowish white to grayish pink, or else whitish yellow to pink with yellowish base and later becoming yellowish white, or else brass yellow to copper red, lustrous, and later becoming pale yellow with pinkish base and apex; segments oblong-obovate, oblong, or oblong-lanceolate, 7–16 × 3–4 mm, margin sometimes minutely denticulate, apex rounded, subacute, or attenuate; inner ones slightly shorter than or rarely equaling outer. Filaments 5.5–8 mm, shorter than perianth segments, connate into a tube for 1/3–3/4 their length, adnate to perianth segments for 1/2–2/3 of connate part; outer ones subulate; inner ones triangular or shoulder-shaped at base. Ovary obovoid, base usually constricted into a short stipe, with concave nectaries. Style 3.5–7 mm; stigma entire or 3-cleft. Fl. and fr. Jun–Sep. $2n = 16$, 32.

Meadows, high mountain bogs, streamsides, moist places; 2400–5400 m. Gansu, Qinghai, W Sichuan, Xinjiang, E and NW Xizang, NW Yunnan [Afghanistan, India, Kazakstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Uzbekistan].

- 1a. Perianth purple-red, minutely black dotted, later becoming yellowish white to grayish pink 102a. var. *atosanguineum*
- 1b. Perianth whitish yellow to pink with yellowish base and later becoming yellowish white, or brass yellow to copper red, lustrous, and later becoming pale yellow with pinkish base and apex.
 - 2a. Perianth whitish yellow to pink with yellowish base, later becoming yellowish white, segments attenuate at apex 102b. var. *fedschenkoanum*
 - 2b. Perianth brass yellow to copper red, lustrous, later becoming pale yellow with pinkish base and apex, segments rounded at apex 102c. var. *tibeticum*

102a. *Allium atosanguineum* var. *atosanguineum*

蓝苞葱(原变种) lan bao cong (yuan bian zhong)

Allium monadelphum Turczaninow ex Karelin & Kirilov.

Perianth purple-red, minutely black dotted, later becoming yellowish white to grayish pink; segments oblong-obovate, oblong, or oblong-lanceolate, 7–9 mm, apex subacute, never attenuate. Fl. Jun. $2n = 16$.

Meadows, streamsides; 2500–3000 m. Qinghai, W Sichuan, Xinjiang (Tarbagatay Shan, Tian Shan) [NE Afghanistan, Kazakstan, Kyrgyzstan, Mongolia, Russia, Tajikistan].

102b. *Allium atosanguineum* var. *fedschenkoanum* (Regel) G. Zhu & Turland, Novon 10: 181. 2000.

费葱 fei cong

Allium fedschenkoanum Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 3(2): 82. 1875; *A. fedschenkoanum* var. *elatum* Regel; *A. kaufmannii* Regel; *A. monadelphum* var. *fedschenkoanum* (Regel) Regel; *A. monadelphum* var. *kaufmannii* (Regel) Regel.

Perianth whitish yellow to pink with yellowish base, later becoming yellowish white; segments oblong-lanceolate, 10–15 mm, margin sometimes minutely denticulate, apex attenuate. Fl. Jun–Jul. $2n = 16$.

Meadows, high mountain bogs, streamsides; 2400–3500 m. Xinjiang (Tian Shan), NW Xizang [Afghanistan, India, Kazakstan, Kyrgyzstan, Pakistan, Tajikistan, Uzbekistan].

102c. *Allium atrosanguineum* var. *tibeticum* (Regel) G. Zhu & Turland, Novon 10: 182. 2000.

藏葱 zang cong

Allium monadelphum var. *tibeticum* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 10: 311. 1887; *A. chalcophengos* Airy Shaw.

Perianth brass yellow to copper red, lustrous, later becoming pale yellow with pinkish base and apex; segments oblong-obovate, 10–16 mm, apex rounded. Fl. Jul–Aug.

• Meadows, moist places; 3500–5400 m. Gansu, Qinghai, W Sichuan, E Xizang, NW Yunnan.

103. *Allium schoenoprasum* Linnaeus, Sp. Pl. 1: 301. 1753.

北葱 bei cong

Bulbs usually clustered, ovoid-cylindric, 0.5–1 cm in diam.; tunic grayish brown or tinged with yellow, papery, lacinate, sometimes fibrous at apex. Leaves 1 or 2, slightly shorter than scape, 2–6 mm wide, terete, fistulose, smooth or scabrous-denticulate. Scape 10–40(–60) cm, terete, covered with leaf sheaths for 1/3–1/2 its length, smooth or scabrous-denticulate. Spathe 2-valved, purple-red, persistent. Umbel subglobose, densely many flowered. Pedicels usually unequal, shorter than perianth, ebracteolate. Perianth purple-red to pale red; segments lanceolate or oblong-lanceolate to oblong, equal, 7–11(–17) × 3–4 mm, apex acute or acuminate. Filaments 1/3–1/2(–2/3) as long as perianth segments, connate at base and adnate to perianth segments for 1–1.5 mm; inner ones with triangular base, ca. 1/2 as wide as outer. Ovary subglobose, with concave nectaries at base. Style not exerted. Fl. and fr. Jul–Sep.

Meadows, valleys, damp slopes, along streams; 2000–3000 m. Xinjiang [India, Japan, Kazakstan, Korea, Mongolia, Pakistan, Russia; SW Asia, Europe, North America].

- 1a. Leaves, leaf sheaths, and scape smooth 103a. var. *schoenoprasum*
- 1b. Leaves, leaf sheaths, and scape scabrous-denticulate along angles 103b. var. *scaberrimum*

103a. *Allium schoenoprasum* var. *schoenoprasum*

北葱(原变种) bei cong (yuan bian zhong)

Allium raddeanum Regel; *Allium sibiricum* Linnaeus.

Leaves, leaf sheaths, and scape smooth. Fl. and fr. Jul–Sep. $2n = 16, 24, 32$.

Meadows, valleys, damp slopes; 2000–3000 m. N Xinjiang (Altay Shan) [India, Japan, Kazakstan, Korea, Mongolia, Pakistan, Russia; SW Asia, Europe, North America].

103b. *Allium schoenoprasum* var. *scaberrimum* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 3(2): 80. 1875.

糙葶北葱 cao ting bei cong

Allium karelinii Poljakov; *A. scabrellum* Boissier & Buhse.

Leaves, leaf sheaths, and scape scabrous-denticulate along angles. Fl. Aug.

Meadows, along streams; 2000–2500 m. Xinjiang (Altay Shan, Tarbagatay Shan, Tian Shan) [Kazakstan, Mongolia, Russia].

104. *Allium oliganthum* Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 14: 856. 1841.

少花葱 shao hua cong

Allium stenophyllum Schrenk.

Bulbs clustered, ovoid, ca. 1 cm in diam.; tunic light brown or violet-brown, membranous to scarious, ± splitting into fibers. Leaves 1 or 2, shorter than scape, 1–2 mm wide, semiterete, adaxially channeled. Scape 8–15(–35) cm, terete, covered with leaf sheaths for 1/3–1/2 its length. Spathe persistent; beak short. Umbel hemispheric to globose, many flowered. Pedicels subequal, 2–3 × as long as perianth, ebracteolate. Perianth pink; segments with darker midvein, oblong, 5–6 × 1–1.5 mm, apex acute. Filaments subequal, slightly shorter than perianth segments, connate at base and adnate to perianth segments. Style slightly exerted. Fl. and fr. Jun–Jul.

Saline meadows, lake shores, along rivers; near sea level to 2000 m. N Xinjiang [Kazakstan, Mongolia, Russia].

105. *Allium maximowiczii* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 3(2): 153. 1875.

马葱 ma cong

Allium schoenoprasum Linnaeus var. *orientale* Regel.

Bulb usually solitary or paired, rarely clustered, tunic gray or yellowish brown, papery, subentire. Leaves 1 or 2, shorter than scape, semiterete to terete, fistulose, smooth. Scape 20–40(–70) cm, covered with leaf sheaths for 1/3–1/2 its length, smooth. Spathe 2-valved, persistent; beak short. Umbel hemispheric, densely many flowered. Pedicels 2–3 × as long as perianth, ebracteolate. Perianth rose pink or dark pink; segments with red, fine midvein, oblong-lanceolate, 5–7 mm, apex acute. Filaments subequal, slightly shorter than or equaling perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones narrowly triangular, ca. 2 × as wide as outer ones at base. Ovary globose. Style exerted. Fl. Jul. $2n = 16$.

Meadows, riversides; 100–500 m. Heilongjiang, Jilin, Nei Mongol [Japan, Korea, Mongolia, Russia].

106. *Allium ledebourianum* Schultes & J. H. Schultes in

Roemer & Schultes, Syst. Veg. 7: 1029. 1830.

硬皮葱 ying pi cong

Allium uliginosum Ledebour, Fl. Altaic. 2: 16. 1830, not G. Don (1827).

Bulbs clustered, narrowly ovoid-cylindric, 0.8–2 cm in diam.; tunic grayish violet to grayish black, membranous to scarious, ± entire, quickly withered. Leaves 1 or 2, shorter than scape, 5–7(–10) mm wide, terete, fistulose. Scape 70–80(–100) cm, terete, covered with leaf sheaths for 1/3–1/2 its length. Spathe 2-valved, persistent. Umbel hemispheric, densely many flowered. Pedicels subequal, 1.5–3 × as long as perianth, ebracteolate. Perianth pale purple; segments ovate-lanceolate to lanceolate, equal, 6–8(–10) × 1.5–2 mm; inner ones with purple midvein, sometimes slightly longer than outer ones, apex acute, shortly pointed. Filaments subequal, longer than perianth segments, connate at base and adnate to perianth segments for ca. 1 mm; outer ones subulate; inner ones narrowly triangular, ca. 2 × as wide as outer ones at base; anthers purple-red. Ovary ovoid-globose, with concave nectaries at base. Style exserted. Fl. and fr. Jun–Sep. $2n = 16$.

Mountains, moist meadows, river banks, gravelly and sandy places; 100–1800 m. Heilongjiang, Jilin, Liaoning, Nei Mongol, N Xinjiang (Altay Shan) [Kazakstan, Mongolia, Russia].

107. *Allium grisellum* J. M. Xu in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 286. 1980.

灰皮薤 hui pi xie

Bulbs clustered, narrowly ovoid, 0.7–1 cm in diam.; tunic black-gray, papery, apex fibrous. Leaves subequaling scape, 1–1.5 mm wide, adaxially channeled. Scape 11–20 cm, terete, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbel few flowered. Pedicels equal, slightly longer than perianth, ebracteolate. Perianth white, slightly tinged with red; segments with purple midvein, oblong, 5.5–6 × ca. 2 mm, apex with a short, slightly reflexed point. Filaments equal, 2/3–3/4 as long as perianth segments, connate and adnate to perianth segments for ca. 1 mm, base broadly triangular, free part subulate; inner ones 1/2 as wide as outer. Ovary ovoid, without concave nectaries at base, apex slightly constricted. Style not exserted. Fl. Jun.

• Meadows; ca. 300 m. C Xinjiang (Toksun Xian).

108. *Allium chinense* G. Don, Mem. Wern. Nat. Hist. Soc. 6: 83. 1827.

头 jiao tou

Allium bakeri Regel; *A. bodinieri* H. Léveillé & Vaniot; *A. martini* H. Léveillé & Vaniot; *Caloscordum exsertum* Lindley.

Bulbs clustered, narrowly ovoid, (0.5–)1–1.5(–2) cm in diam.; tunic white, sometimes tinged with red, membranous, entire. Leaves subequaling scape, 1–3 mm wide, 3–5-angled, fistulose. Scape lateral, 20–40 cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel nearly hemispheric, laxly flowered. Pedicels subequal, 2–4 × as long as perianth, bracteolate. Perianth pale purple to dull purple; seg-

ments broadly elliptic to suborbicular, 4–6 × 3–4 mm; inner ones slightly longer than outer. Filaments equal, ca. 1.5 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, 1-toothed on each side. Ovary obovoid-globose, with concave nectaries covered by hoodlike projections at base. Style exserted. Fl. and fr. Oct–Nov. $2n = 24^*$, 32^* .

• Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangxi, Zhejiang.

Cultivated as a vegetable in tropical and subtropical China.

109. *Allium yanchiense* J. M. Xu in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 286. 1980.

白花薤 bai hua xie

Bulb solitary or clustered, narrowly ovoid, 1–2 cm in diam.; tunic dirty gray, papery, apex fibrous. Leaves shorter than scape, 1–2 mm wide, semiterete, fistulose, smooth or minutely scabrous-denticulate along angles. Scape terminal, 20–40 cm, terete, smooth or minutely scabrous-denticulate, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel globose, densely many flowered. Pedicels 1–2 × as long as perianth, bracteolate. Perianth white to pale red, sometimes greenish; segments usually with pale red midvein; outer ones oblong-ovate, 4–5.2 × 1.8–2.7 mm, apex obtuse; inner ones oblong to ovate-oblong, 4–6 × 2–2.9 mm, apex obtuse or retuse, sometimes irregularly denticulate. Filaments subulate, equal, 1/5–1/2 as long as perianth segments, connate at base and adnate to perianth segments. Ovary ovoid-globose, with concave nectaries covered by hoodlike or sometimes tongue-shaped projections at base. Style exserted. Fl. and fr. Aug–Sep.

• Shady and damp slopes, valleys; 1300–2000 m. Gansu, WC Hebei (Xiaowutai Shan), W Nei Mongol (Helan Shan), E and N Ningxia (Helan Shan, Yanchi Xian), Qinghai (Jigzhi Xian), N Shaanxi (Jingbian Xian), W Shanxi (Wuzhai Xian, Zhongyang Xian).

110. *Allium sacculiferum* Maximowicz, Mém. Acad. Imp. Sci. St.-Petersbourg Divers Savans 9: 281. 1859.

朝鲜薤 chao xian xie

Allium komarovianum Vvedensky; *A. pseudojaponicum* Makino; *A. yuchuanii* Y. Z. Zhao & J. Y. Chao.

Bulb solitary or often paired, cylindric or ovoid-cylindric, 0.7–1.5(–2) cm in diam.; outer tunic dark brown to brownish black, thinly leathery, split into fibers and subreticulate, rarely subentire. Leaves 3–5(–7), linear, shorter than scape, (2–)3–4(–5) mm wide, rarely subfistulose near base, keeled to nearly 3-angled, margin smooth, apex subattenuate. Scape 30–60(–70) cm, terete, covered with leaf sheaths for 1/4–1/2 its length. Spathe 1- or 2-valved, persistent; beak ca. 1/2 as long as limb. Umbel globose, densely many flowered. Pedicels 1.5–3 × as long as perianth, bracteolate. Perianth lilac-pink to red-violet; segments with dark red or purple midvein; outer ones elliptic, boat-shaped, 4–4.5 × ca. 2 mm, apex obtuse; inner ones elliptic, 4.5–5(–5.5) × 2–2.5 mm, apex truncate. Filaments equal, ca. 1.5 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary obovoid-globose. Style long exserted. Fl. Aug–Sep. $2n = 16$.

Meadows, riversides, lakesides; 100–500 m. Heilongjiang, Jilin,

Liaoning, NE Nei Mongol [N Japan, Korea, Russia].

111. *Allium thunbergii* G. Don, Mem. Wern. Nat. Hist. Soc. 6: 84. 1827.

球序薤 qiu xu xie

Allium odorum Thunberg, Fl. Jap. 132. 1784, not Linnaeus (1767); *A. bakeri* Regel var. *morrisonense* (Hayata) Tang S. Liu & S. S. Ying; *A. japonicum* Regel; *A. morrisonense* Hayata; *A. taquetii* H. Léveillé.

Bulb solitary, rarely paired, ovoid to ovoid-cylindric, 1–2 cm in diam.; outer tunic whitish black-brown to dirty black, membranous to scarious or subpapery, apex sometimes lacinate to fibrous. Leaves linear, longer than scape, 2–4 mm wide, 3-angled, subfistulose, margin smooth, apex attenuate. Scape 25–40(–50) cm, covered with leaf sheaths for 1/4–1/3 its length. Spathe 1- or 2-valved, persistent; beak short. Umbel subfascicled to globose, laxly many flowered. Pedicels subequal, 3–4 × as long as perianth, bracteolate. Perianth red to purple; segments with dark midvein, ovate-elliptic, 5–6 × 2.5–3.5 mm, apex obtuse; outer ones boat-shaped, shorter than inner. Filaments subulate, ca. 1.5 × as long as perianth segments, connate at base and adnate to perianth segments; inner ones sometimes with 1 very small tooth on each side. Ovary subglobose. Style long exserted. Fl Aug–Oct. $2n = 16^*$, 32.

Forest margins, slopes, pastures; near sea level to 1300 m. Hebei, Heilongjiang, Henan, E Hubei, Jiangsu, Jilin, Liaoning, E Nei Mongol, S Shaanxi, Shandong, Shanxi, Taiwan [Japan, Korea].

112. *Allium songpanicum* J. M. Xu in F. T. Wang & Tang, Fl. Reipubl. Popularis Sin. 14: 286. 1980.

松潘薤 song pan xie

Bulb solitary or clustered, ovoid to narrowly so, 0.5–1.5 cm in diam.; tunic dirty brown, papery, apex fibrous. Leaves narrowly linear, slightly longer than scape, 1.5–3 mm wide. Scape 12–20 cm, slender, terete, finely angled, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel few flowered. Pedicels unequal, 3–5 × as long as perianth, ebracteolate. Perianth purple-red; segments subequal; outer ones ovate-oblong, 4–4.5 × 1.9–2.5 mm; inner ones ovate to broadly so, 4–4.5 × 2.3–2.9 mm. Filaments equal, ca. 2 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, 1-toothed on each side, teeth 2.2–2.5 mm, irregularly denticulate at apex. Ovary obovoid, with concave nectaries covered by hoodlike projections at base. Style exserted. Fl. and fr. Oct–Nov.

• Forest, scrub; 1600–1700 m. N Sichuan (Nanping Xian, Songpan Xian).

113. *Allium juldusicola* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 523. 1880.

尤尔都斯薤 you er du si xie

Bulb solitary, ovoid, 1.5 cm in diam.; tunic delicately reticulate. Leaves narrowly linear, flat, solid, margin scabrous-denticulate. Scape 20–30 cm, terete, smooth, covered with leaf sheaths only at base. Spathe 1-valved; beak short. Umbel glo-

bose, densely many flowered. Pedicels subequaling perianth, bracteolate. Perianth white; segments oblong-lanceolate, 3–4 × ca. 1.5 mm, apex subacute. Filaments linear-subulate, slightly shorter or longer than perianth segments, connate at base and adnate to perianth segments. Ovary applanate-globose, without concave nectaries at base. Style very short, not exserted. Fr. Sep.

• High plains, steppes. W Xinjiang (Youerduisi).

Only fruiting type material has been seen by the present authors.

114. *Allium tanguticum* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 10: 317. 1887.

唐古薤 tang gu xie

Bulb solitary, ovoid to ovoid-globose, 1–1.5 cm in diam.; tunic grayish brown to grayish yellow, papery, usually fibrous at apex. Leaves linear, shorter than scape, 1–3(–4) mm wide, flat, adaxially channeled, scabrous-denticulate along angles. Scape 15–40 cm or more, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel hemispheric, densely many flowered. Pedicels subequal, 2–3 × as long as perianth, bracteolate. Perianth purple to purple-red; segments narrowly lanceolate to ovate-lanceolate, (3–)4–5 × 1–1.8 mm, apex acuminate. Filaments equal, 1.5(–2) × as long as perianth segments, connate at base and adnate to perianth segments; inner ones narrowly triangular at base, distinctly wider than outer. Ovary subglobose, with concave nectaries at base. Style slightly exserted. Fl. and fr. Jul–Sep. $2n = 32^*$, 48*.

• Dry slopes, sandy places, plains; 2000–3500 m. Gansu, Qinghai, Xizang (Lholong Xian).

115. *Allium eusperma* Airy Shaw, Notes Roy. Bot. Gard. Edinburgh 16: 137. 1931.

真籽薤 zhen zi xie

Bulb solitary, ovoid-globose, 1–2 cm in diam.; tunic yellow-brown to grayish brown, usually tinged with red, membranous to papery, entire or fibrous at apex. Leaves 3/4 as long as to slightly longer than scape, (0.5–)1.5–3 mm wide, semi-terete, fistulose, smooth. Scape 20–50 cm, terete, covered with leaf sheaths for ca. 1/2 its length. Spathe 2-valved, persistent. Umbel hemispheric to globose, densely many flowered. Pedicels subequal, 2–3 × as long as perianth, ebracteolate, rarely a few bracteolate. Perianth pink to pale purple-red; segments ovate-oblong to ovate-lanceolate, 4–5 × 1–1.5 mm. Filaments equal, 1.3–1.5 × as long as perianth segments, connate at base and adnate to perianth segments; inner ones slightly longer than outer, base narrowly triangular, sometimes with 1 short tooth on each side. Ovary subglobose, with concave nectaries at base. Style exserted. Fl. and fr. Aug–Sep.

• Forest margins, slopes; 2000–2800 m. W Sichuan (Sêrxü Xian, Xiangcheng Xian), NW Yunnan (Dêqên Xian).

116. *Allium maowenense* J. M. Xu in J. M. Xu et al., Acta Phytotax. Sin. 32: 356. 1994.

茂汶薤 mao wen xie

Bulb solitary or clustered, ovoid to narrowly so, 1–2 cm in

diam.; tunic pale brown, thinly leathery, apex subfibrous. Leaves shorter than scape, 2–5 mm wide, semiterete, fistulose, adaxially channeled, smooth. Scape 16–30(–60) cm, terete, covered with leaf sheaths only at base. Spathe 1-valved, deciduous. Umbel globose, densely many flowered. Pedicels equal, ca. 2 × as long as perianth, ebracteolate. Perianth white; segments with greenish or pale red midvein; outer ones narrowly ovate, boat-shaped, 3–5 × 1.5–2 mm; inner ones ovate, 4–5.5 × 2–3 mm. Filaments subulate, equal, ca. 2 × as long as perianth segments, connate at base and adnate to perianth segments. Ovary green, subglobose, with concave nectaries covered by short, hoodlike projections at base. Style exserted; stigma punctiform. Fl. and fr. Sep–Nov. $2n = 16^*$.

• Dry slopes; 1100–1500 m. NC Sichuan (Mao Xian, Wenchuan Xian).

117. *Allium sabulosum* Steven ex Bunge in Goebel, Reise Steppen Russl. 2: 311. 1838.

沙地薤 sha di xie

Bulb solitary, cylindrical ovoid to ovoid, 1.5–2 cm in diam., with pale brown, sometimes yellowish brown, irregularly tuberculate-pitted bulbs; tunic grayish to pale brown, leathery, with parallel veins, usually splitting along veins. Leaves shorter than scape, 1–2 mm wide, semiterete, fistulose, adaxially channelled, smooth, rarely scabrous-denticulate. Scape 20–60 cm, stout, fistulose, covered with leaf sheaths for ca. 1/4 its length. Spathe quickly deciduous; beak long. Umbel hemispheric to globose, densely many flowered. Pedicels 3–5 × as long as perianth, bracteolate. Perianth greenish; segments with green midvein in fruit, elliptic, equal, ca. 3 mm; outer ones boat-shaped; inner ones retuse at apex. Filaments subulate, equal, slightly longer than perianth segments, connate at base and adnate to perianth segments. Ovary globose, with very small nectaries. Style exserted. Fl. and fr. May–Jun. $2n = 16$.

Sandy places. W Xinjiang (Huocheng Xian) [Kazakstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan].

118. *Allium delicatulum* Sievers ex Schultes & J. H. Schultes in Roemer & Schultes, Syst. Veg. 7: 1133. 1830.

迷人薤 mi ren xie

Allium dolonkarense Regel; *A. willdenowii* Kunth.

Bulb solitary, ovoid-globose, 0.8–1.5 cm in diam., sometimes with yellowish white, smooth bulbs; tunic gray to nearly black, membranous to papery. Leaves 2 or 3, shorter than scape, 0.5–1.5 mm wide, semiterete, adaxially channeled, smooth, rarely scabrous-denticulate. Scape 15–25 cm, terete, covered with leaf sheaths for 1/3–1/2 its length. Spathe 2-valved, persistent; beak short or long, rarely to 3 × as long as limb. Umbel fascicled to subglobose, few or many flowered. Pedicels subequal, 2–3(–4) × as long as perianth, bracteolate, rarely ebracteolate. Perianth white to red; segments with purple-red midvein, lanceolate to ovate-lanceolate, equal, (3–)4–6 × 1.5–2 mm, apex obtuse to subacute; inner ones somewhat wider than outer. Filaments triangular-subulate, 3/4 as long as to subequaling perianth segments, connate at base and adnate to perianth segments for ca. 1/5 their length; inner ones ca. 1.5 ×

as wide as outer at base. Ovary ovoid-globose, minutely tuberculate. Style short, but elongate after anthesis, scarcely exserted; stigma punctiform. Fl. and fr. Jun–Jul.

Pastures, dry slopes, deserts, sands and saline places. N Xinjiang [Kazakstan, Russia].

119. *Allium glomeratum* Prokhanov, Izv. Glavn. Bot. Sada SSSR 29: 560. 1930.

头花薤 tou hua xie

Bulb solitary, ovoid-globose, 0.8–1.5(–2) cm in diam.; tunic gray to grayish yellow, membranous to papery, subterete to slightly fibrous. Leaves 2 or 3, narrowly linear, shorter than scape, 0.5–1.5 mm wide, adaxially channeled, scabrous-denticulate along angles. Scape 6–30 cm, terete, covered with leaf sheaths for ca. 1/3 its length. Spathe 2-valved, persistent; beak short. Umbel hemispheric to globose, densely many flowered. Pedicels subequal, equaling to slightly longer than perianth, bracteolate. Perianth pale purple; segments ovate-lanceolate, 4–6 × 1.5–2 mm, apex acute; inner ones slightly narrower than outer. Filaments equal, slightly shorter than to subequaling perianth segments, connate and adnate to perianth segments, base narrowly triangular, free part subulate. Ovary globose, without concave nectaries at base. Style exserted. Fl. and fr. Jul–Aug.

Slopes, valleys; 1500–3000 m. Xinjiang (Kunlun Shan, Tian Shan) [Kyrgyzstan].

120. *Allium pallasii* Murray, Novi Comment. Soc. Regiae Sci. Gott. 6: 32. 1775.

小山薤 xiao shan xie

Allium albertii Regel; *A. caricifolium* Karelin & Kirilov; *A. lepidum* Ledebour; *A. semiretschensianum* Regel; *A. tenue* G. Don.

Bulb solitary, ovoid-globose to subglobose, 0.7–1.5(–2) cm in diam.; tunic grayish white to pinkish white, membranous, transparent, with parallel veins, entire. Leaves 3–5, shorter than scape, 0.5–1.5(–2.5) mm wide, semiterete, adaxially channeled. Scape 15–30 cm, terete, covered with leaf sheaths for 1/4–1/2 its length. Spathe 2-valved, persistent. Umbel hemispheric to globose, laxly or densely many flowered. Pedicels subequal, 2–4 × as long as perianth, ebracteolate or a few bracteolate. Perianth pale red to pale purple; segments lanceolate to oblong lanceolate, equal, 2–4 × 0.8–1.8 mm; inner ones usually narrower than outer. Filaments 1–1.5 × as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, sometimes 1-toothed on each side. Ovary subglobose, minutely tuberculate, with concave nectaries at base. Style slightly exserted; stigma globose. Fl. and fr. Apr–Jul. $2n = 16$.

Deserts, dry slopes; 600–2300 m. N Xinjiang (Altay Shan, Tarbagatay Shan) [Kazakstan, Mongolia, Russia].

One of us (Kamelin) believes that plants with bracteolate pedicels represent another species, *Allium semiretschensianum* Regel (Trudy Imp. S.-Peterburgsk. Bot. Sada 5: 630. 1878), and limits *A. pallasii* to plants with ebracteolate pedicels. *Allium albertii* Regel (loc. cit.: 632) was described from plants collected on sands in W Xinjiang between Huocheng Xian and Ili He, and is regarded by Kamelin as an uncertain

species, similar to *A. semiretschensianum*, but only 20–30 cm high, with a membranous and finely reticulate-veined tunic, and ebracteolate pedicels. Xu believes that both *A. albertii* and *A. semiretschensianum* are synonymous with *A. pallasii*, and notes that other species exhibit both bracteolate and ebracteolate pedicels, e.g., *A. easperma* and *A. sairamense*.

121. *Allium macrostemon* Bunge, Enum. Pl. China Bor. 65. 1833.

薤白 xie bai

Allium chanetii H. Léveillé; *A. grayi* Regel; *A. grayi* var. *chanetii* (H. Léveillé) H. Léveillé; *A. iatasei* H. Léveillé; *A. nereidum* Hance; *A. nipponicum* Franchet & Savatier; *A. ouen-sanense* Nakai; *A. uratense* Franchet.

Bulb solitary, subglobose, 0.7–1.5(–2) cm in diam., usually with bulbels at base; tunic blackish, papery or membranous, entire. Leaves shorter than scape, 2–5 mm wide, semiterete or 3-angled-semiterete, abaxially strongly 1-angled, fistulose, adaxially channeled. Scape 30–70 cm, terete, covered with leaf sheaths for 1/4–1/3 its length. Spathe 2-valved, persistent. Umbel hemispheric to globose, densely many flowered, bearing bulblets and flowers or bulblets only. Pedicels subequal, 3–5 × as long as perianth, bracteolate. Perianth pale purple to pale red; segments oblong-ovate to oblong-lanceolate, equal, 4–5.5 × 1.2–2 mm; inner ones usually shorter than outer. Filaments equal, 1/2 as long as to slightly shorter than perianth segments, connate and adnate to perianth segments, base triangular; inner ones ca. 1/2 as wide as outer at base. Ovary subglobose, with concave nectaries covered by hoodlike projections at base. Style exserted. Fl. and fr. May–Jul. $2n = 16, 24, 32^*, 40^*, 48$.

Hills, slopes, valleys, plains; near sea level to 1600 m (to 3000 m in Xizang and Yunnan). Throughout China except Hainan, Qinghai, and Xinjiang [Japan, Korea, Mongolia, Russia (Far East)].

122. *Allium caeruleum* Pallas, Reise Russ. Reich. 2: 737. 1773.

棱叶薤 leng ye xie

Allium azureum Ledebour; *A. coerulescens* G. Don; *A. viviparum* Karelin & Kirilov.

Bulb solitary, subglobose, 1–2 cm in diam., usually bearing bulbels at base; tunic dull gray, papery, entire. Leaves linear, twisted when dried, shorter than scape, (1–)2–5 mm wide, fistulose, abaxially angled, smooth or scabrous-denticulate along angles. Scape 25–35 cm, terete, smooth or scabrous-denticulate along angles, covered with leaf sheaths for ca. 1/3 its length. Spathe 2-valved, persistent. Umbel hemispheric to globose, densely many flowered, sometimes with bulblets or with bulblets only. Pedicels subequal, 2–6 × as long as perianth, bracteolate. Perianth azure; segments oblong to oblong-lanceolate, equal, 3–5 × 0.8–1.8 mm; inner ones narrower than outer. Filaments equal, slightly shorter to slightly longer than perianth segments, connate and adnate to perianth segments, base triangular; inner ones 1.5–2 × as wide as outer, sometimes 1-toothed on each side at base. Ovary subglobose, with concave nectaries covered by hoodlike projections at base. Style exserted. Fl. and fr. Jun–Aug. $2n = 16$.

Dry slopes, plains; 1100–2300 m. Xinjiang (Altay Shan, Tian

Shan) [Kazakstan, Kyrgyzstan, Russia, Tajikistan, Uzbekistan].

123. *Allium caesium* Schrenk, Bull. Cl. Phys.-Math. Acad. Imp. Sci. Saint-Petersbourg 2: 113. 1844.

知母薤 zhi mu xie

Allium renardii Regel; *A. urceolatum* Regel.

Bulb solitary, ovoid-globose, 1–1.5 cm in diam., with grayish brown or violet bulbels at base; tunic gray, subleathery to papery. Leaves 2 or 3, slightly shorter to slightly longer than scape, 1–3 mm wide, semiterete, sometimes fistulose, adaxially channeled, scabrous-denticulate, rarely subsmooth. Scape 15–65 cm, scabrous-denticulate or rarely subsmooth, covered with leaf sheaths for 1/4–1/2 its length. Spathe persistent. Umbel hemispheric to globose, densely many flowered, sometimes with a few bulblets, never with bulblets only. Pedicels equal, 2–3(–5) × as long as perianth, bracteolate. Perianth azure, rarely white; segments with darker midvein, oblong to oblong-lanceolate, equal, 4–6 mm, apex subobtusate; inner ones slightly wider than outer. Filaments 3/4 as long as to equaling perianth segments, connate at base and adnate to perianth segments; outer ones narrowly triangular; inner ones broadened for ca. 2/3 their length, to 2 × as wide as outer ones, with 1 obtuse tooth on each side. Style slightly exserted. Fl. and fr. May–Jun. $2n = 16, 32$.

Deserts, dry pastures; 700–2000 m. N and W Xinjiang [Kazakstan, Kyrgyzstan, Tajikistan, Uzbekistan].

124. *Allium schoenoprasoides* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 5: 630. 1878.

类北薤 lei bei xie

Bulb solitary, broadly ovoid to subglobose, 0.8–1.5 cm in diam.; tunic purple-black to black, membranous, entire. Leaves 2 or 3, shorter than scape, 1–3 mm wide, semiterete, sometimes fistulose, adaxially channeled. Scape 10–15(–20) cm, terete, covered with leaf sheaths for 1/3–1/2 its length. Spathe deciduous. Umbel globose, densely many flowered. Pedicels subequal, shorter than to subequaling perianth, ebracteolate. Perianth purple-red; segments oblong-lanceolate to oblong-ovate, 4.5–8 × 2–3 mm, apex obtuse or attenuate. Filaments equal, 1/3–1/2 as long as perianth segments, connate at base and adnate to perianth segments for ca. 1 mm; outer ones subulate; inner ones with basal 2/3–3/4 broadened, ovate-oblong, with 1 small tooth on each side. Ovary ovoid-globose, without concave nectaries at base. Style not exserted. Fl. and fr. Jul–Aug. $2n = 16$.

Slopes, pastures; 2700–3000 m. Xinjiang (Tian Shan) [Kazakstan, Kyrgyzstan, Tajikistan].

125. *Allium sairamense* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 6: 520. 1880.

赛里木薤 sai li mu xie

Bulb solitary, subglobose, 1–1.5 cm in diam.; tunic whitish lilac to brownish violet, membranous, entire. Leaves 2, usually shorter than scape, 1–3 mm wide, semiterete, solid, margin minutely scabrous-denticulate. Scape (15–)25–40 cm, terete, covered with leaf sheaths for ca. 1/3 its length. Spathe 2-valved; beak very short. Umbel hemispheric to globose, many flowered.

Pedicels shorter than or subequaling perianth, ebracteolate or a few bracteolate. Perianth pale purple to purple-red, lustrous; segments elliptic-lanceolate, 6–7 mm, apex acute. Filaments ca. 1/3 as long as perianth segments, connate at base and adnate to perianth segments; outer ones narrowly triangular; inner ones wider than outer, entire. Ovary applanate-globose, without concave nectaries. Style short, not exerted. Fl. Jun–Jul.

Slopes in *Picea* forests, meadows, subalpine to alpine slopes; 2400–3400 m. W Xinjiang (Tian Shan) [Kazakhstan (basin of Ili River)].

126. *Allium jacquemontii* Kunth, Enum. Pl. 4: 399. 1843.

高原薤 gao yuan xie

Bulb solitary, ovoid, ca. 1 cm in diam.; tunic lilac-brown to brown-black, scariosus. Leaves 2(or 3), 0.7–1.5 mm wide, semiterete, fistulose, margin glabrous. Scape (15–)25–40 cm, slender, terete. Spathe 2-valved, persistent; beak very short. Umbel hemispheric, many flowered. Pedicels ca. 3 × as long as perianth, ebracteolate. Perianth pale red to pale purple; segments with darker midvein, elliptic-lanceolate, 4.5–5 × 2–2.5 mm, apex acute. Filaments triangular, 1/2–2/3 as long as perianth segments, connate at base and adnate to perianth segments, entire; inner ones 1.5–2 × as wide as outer. Ovary globose, without concave nectaries. Style not exerted. Fl. Jul.

High plateaus, gravelly places; 4200–4600 m. SW Xinjiang (upper reaches of Karakax He), S and W Xizang (Gar Zangbo, Raka Zangbo, Rutog Xian) [India, Pakistan].

127. *Allium porrum* Linnaeus, Sp. Pl. 1: 295. 1753.

韭葱 jiu cong

Bulb solitary, cylindrical ovoid to subglobose, sometimes bearing bulbels; tunic white, membranous, entire. Leaves broadly linear to linear-lanceolate, shorter than scape, 1–5 cm wide or more, slightly conduplicate, abaxially keeled. Scape 60–80 cm or more, terete, covered with leaf sheaths for ca. 1/2 its length. Spathe 1-valved, deciduous; beak long. Umbel globose, densely many flowered. Pedicels subequal, several times as long as perianth, bracteolate. Perianth white to pale purple; segments with green midvein, suboblong, 4.5–5 × 2–2.3 mm, apex acute; outer ones denticulate along midvein abaxially. Filaments slightly longer than perianth segments, connate at base and adnate to perianth segments; outer ones narrowly triangular to linear-triangular, margin denticulate toward base; inner ones oblong, as wide as perianth segments for ca. 2/3 their length, 1-toothed on each side, teeth with apex elongated into a twisted, filiform cusp much longer than anther-bearing cusp. Ovary ovoid-globose, with transversely convex nectaries near middle of septa. Style exerted. Fl. and fr. May–Jul. $2n = 32$.

Cultivated as a vegetable [native to SW Asia and Europe; also widely cultivated].

128. *Allium sativum* Linnaeus, Sp. Pl. 1: 296. 1753.

蒜 suan

Allium pekinense Prokhanov.

Bulb solitary, globose to applanate-globose, usually consisting of several bulbels covered with a common tunic; tunic white to purple, membranous, entire. Leaves broadly linear to linear-lanceolate, shorter than scape, to 2.5 cm wide, apex acu-

minate. Scape 25–50 cm, terete, covered with leaf sheaths for ca. 1/2 its length. Spathe deciduous; beak 7–20 cm. Umbel with many bulblets and few flowers. Pedicels slender, longer than perianth; bracteoles ovate, rather large, membranous, apex acute. Perianth usually pale red; outer segments ovate-lanceolate, ca. 4 × 1.4 mm; inner ones ovate, ca. 3 × 1.4 mm. Filaments shorter than perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones broadened at base, 1-toothed on each side, teeth with apex filiform and longer than perianth segments. Ovary globose. Style not exerted. Fl. Jul. $2n = 16^*$, 48.

Cultivated as a vegetable [native to Asia; also widely cultivated].

129. *Allium oreophilum* C. A. Meyer, Verzeichn. Pfl. Cauc. 37. 1831.

高地蒜 gao di suan

Allium ostrowskianum Regel; *A. platystemon* Karelin & Kirilov.

Bulb solitary, ovoid-globose, 1.5–2 cm in diam.; tunic grayish, papery. Leaves 2, linear, longer than scape, 4–6(–8) mm wide, margin scabrous. Scape (5–)15–20 cm, terete, covered with leaf sheaths only at base. Spathe 2- or 3-valved, sometimes reddish, scariosus, apex acuminate. Umbel subglobose, laxly 10–15-flowered. Pedicels equaling or a few longer than perianth, rarely shorter, ebracteolate. Perianth red, cupular; segments with dark midvein, broadly elliptic, 8–11 × 4–4.5 mm, apex obtuse or gradually attenuate, not acute. Filaments unequal, ca. 1/2 as long as perianth segments, connate and adnate to perianth segments for ca. 1/2 their length; inner ones ± lanceolate-ovate, wider than outer ones. Ovary ovoid, without concave nectaries. Style short; stigma 3-cleft. Fl. Jul–Aug. $2n = 14, 16$.

Gravelly slopes; 2500–3000 m. N and W Xinjiang (Altay Shan, Tian Shan) [Afghanistan, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Uzbekistan; SW Asia].

130. *Allium tulipifolium* Ledebour, Fl. Altaic. 2: 9. 1830.

郁金香 yu jin ye suan

Bulb ovoid-globose, 1.5–2 cm in diam.; outer tunic gray, quickly lost; inner layers milk white, subpapery, entire. Leaves 2 or 3, glaucous, broadly linear, much shorter than scape, 1–1.5(–2) cm wide, margin dark green or whitish red, papillose-denticulate, apex gradually attenuate. Scape 20–30(–40) cm, terete, covered with leaf sheaths only at base. Spathe 2(or 3)-valved, lacinate, partly persistent, apex acuminate. Umbel hemispheric, many flowered. Pedicels ca. 3 × as long than perianth, ebracteolate. Perianth stellate, recurved and withered after anthesis, white; segments with green or purple-violet, fine midvein, narrowly elliptic, 4.5–5 × 1.5–2 mm, apex subacute. Filaments subequaling perianth segments, connate and adnate to perianth segments, base broadened; inner ones nearly 2 × as wide as outer. Ovary ovoid, without concave nectaries at base; ovules 4–6 per locule. Fl. May. $2n = 16$.

Scrub, slopes, steppes; 600–1000 m. NW Xinjiang [Kazakhstan, Russia].

In FRPS, a broad species concept was adopted, with *Allium tulipifolium* and *A. roborowskianum* treated as synonyms of *A. decipiens*

Fischer ex Schultes & J. H. Schultes, under which name all specimens in Chinese herbaria are filed. In the present account, a narrow species concept is adopted, with *A. tulipifolium* and *A. roborowskianum* treated separately from *A. decipiens*, which was described from Ukraine and does not occur in China.

131. *Allium roborowskianum* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 10: 359. 1887.

新疆蒜 xin jiang suan

Allium sinkiangense F. T. Wang & Y. C. Tang.

Bulb solitary, subglobose, 1.5–2.5 cm in diam., tunic whitish gray to grayish black, quickly lost; inner layers milk white, papery, entire. Leaves (1 or)2, linear, shorter than scape, 7–15 mm wide, margin minutely scabrous-denticulate or smooth, apex acute. Scape 30–50 cm, terete, covered with leaf sheaths only at base. Spathe 2- or 3-valved, partly persistent, apex acuminate. Umbel hemispheric, many flowered. Pedicels 1.5–2 × as long as perianth, ebracteolate. Perianth recurved or erect after anthesis, white or whitish lilac to lilac-pink, persistent; segments with green or purple midvein, ovate-elliptic to elliptic, 4–5 × 1.5–2 mm, apex obtuse. Filaments 2/3 as long as to slightly shorter than perianth segments, connate at base and adnate to perianth segments; outer ones narrowly triangular from broadened base; inner ones triangular from higher, broadly triangular-ovate base. Ovary obovoid-globose, densely papillose, without concave nectaries at base; ovules ca. 4 per locule. Fl. May.

Forests on shady slopes, sands, sandy mud; 1000–1300 m. W Xinjiang (Huocheng Xian) [Mongolia].

132. *Allium robustum* Karelin & Kirilov, Bull. Soc. Imp. Naturalistes Moscou 14: 753 [“853”]. 1841.

健蒜 jian suan

Allium robustum var. *alpestre* Karelin & Kirilov.

Bulb solitary, subglobose, 1–2 cm in diam.; tunic blackish, papery, quickly lost; inner layers yellowish white. Leaves 2–4, linear, much shorter than scape, 2–10 mm wide, smooth. Scape 40–60 cm, terete, slightly ribbed, covered with leaf sheaths only at base. Spathe 2/3 as long as to slightly shorter than umbel, apex shortly acuminate. Umbel hemispheric to subglobose, densely many flowered. Pedicels equal, 1.5–2(–3) × as long as perianth, ebracteolate. Perianth stellately spreading or rotate, recurved and twisted after anthesis, red to purple-red; segments with dark purple midvein, linear-lanceolate to obovate-oblancoate, 5–5.5 × ca. 2 mm, apex subobtusate. Filaments equaling perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones with triangular base, ca. 2 × as wide as outer ones. Ovary applanate-globose, minutely tuberculate, with small, concave nectaries at base; ovules 4 or more per locule. Fl. and fr. May–Jun.

Scrub, steppes, stony and dry slopes; 600–1000 m. N Xinjiang (Qinghe Xian, Tacheng Xian) [E Kazakhstan].

133. *Allium fetisowii* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 5: 631. 1878.

多籽蒜 duo zi suan

Allium simile Regel; *A. tschimganicum* B. Fedtschenko.

Bulb solitary, globose, 1–2.5 cm in diam.; tunic grayish black, papery, splitting at apex. Leaves broadly linear, much shorter than scape, 2–15 mm wide. Scape 30–70 cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent. Umbel hemispheric to globose, densely many flowered. Pedicels subequal, 2–3 × as long as perianth, ebracteolate. Perianth stellately spreading, recurved and twisted after anthesis, purple-red; segments linear to linear-lanceolate, (4–)5–7 × 1–1.2 mm, without strong midvein. Filaments equal, 3/4–4/5 as long as perianth segments, connate at base and adnate to perianth segments; outer ones subulate; inner ones with broadened part subsquare and with 1 or 2 teeth on each side, rarely triangular and entire. Ovary subglobose, minutely tuberculate, with cracklike nectaries at base; ovules 4–6 per locule. Fl. and fr. Apr–Jun. $2n = 16$.

Among shrubs in meadows, exposed places. W Xinjiang (Xinjiang Xian) [Kyrgyzstan, Tajikistan].

One of us (Kamelin) believes that plants with basally entire inner filaments represent a new, as yet undescribed species; however, further study is required to ascertain their true status.

134. *Allium winklerianum* Regel, Trudy Imp. S.-Peterburgsk. Bot. Sada 8: 661. 1884.

伊犁蒜 yi li suan

Bulb globose, 0.75–2 cm in diam.; tunic blackish gray, usually papery. Leaves (1 or)2–4, broadly linear, shorter than scape, (5–)10–25 mm wide, margin smooth or scabrous-denticulate, apex acute. Scape subterranean, 15–40 cm, terete, covered with leaf sheaths only at base. Spathe 2-valved, persistent; beak short. Umbel hemispheric, densely many flowered. Pedicels equal, ca. 1.5 × as long as perianth, ebracteolate. Perianth pinkish lilac to red-lilac, faded after anthesis, campanulate; segments without strong midvein, linear-oblong, 7–10(–15) × 2.5–3 mm, apex rounded. Filaments ca. 1/2 as long as perianth segments, connate for 1/2–2/3 their length and adnate to perianth segments, apex triangular; inner ones wider than outer. Ovary ovoid, without concave nectaries; ovules 4 or more per locule. Style short. Fl. May–Jun. $2n = 16$.

Forests, scrub, moist slopes; 1000–2500 m. W Xinjiang (basin of Ili He) [C Afghanistan, Kyrgyzstan, Tajikistan].

135. *Allium tubiflorum* Rendle, J. Bot. 44: 44. 1906.

合被韭 he bei jiu

Caloscordum tubiflorum (Rendle) Traub.

Plants without onionlike or garliclike odor. Bulb solitary, ovoid-globose to subglobose, 1–2 cm in diam.; tunic grayish black, membranous, entire. Leaves equaling to longer than scape, 1–3 mm wide, terete to subterete, fistulose, scabrous-denticulate along angles. Scape 15–30(–40) cm, terete, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbel few flowered. Pedicels unequal, 0.8–4(–7) cm, bracteolate. Perianth stellately spreading, red to purple; segments ovate-oblong, 5–7(–8) × 1.5–2(–2.4) mm, connate at base into a ca. 2 mm tube, apex obtuse or acute; inner ones equaling or slightly longer than outer. Filaments subulate, ca. 1/2 as long as perianth segments, connate at base and adnate to perianth segments for ca. 2 mm. Ovary conical, without concave

nectaries at base; ovules (3 or)4(–6) per locule. Stigma 3-cleft. Fl. and fr. Jul–Oct. $2n = 16^*$, 32^* .

• Shrubby areas, slopes, rock crevices; near sea level to 2000 m. Gansu, Hebei, Henan, Hubei, Shaanxi, Shanxi, NE Sichuan.

136. *Allium inutile* Makino, Bot. Mag. (Tokyo) 12: 104. 1898.

齿棱茎合被韭 chi leng jing he bei jiu

Caloscordum inutile (Makino) Okuyama & Kitagawa.

Plants without onionlike or garliclike odor. Bulb solitary, ovoid or obovoid to subglobose, 1.1–1.3 cm in diam.; tunic pale brown, membranous, longitudinally veined. Leaves to 30 cm, semiterete, midvein raised abaxially. Scape 18–28 cm \times 1–1.5 mm, terete, ribbed, covered with 3–5 leaf sheaths at base; ribs with short, thick, triangular teeth. Spathe 1-valved, pale brown, 9–12 mm, membranous, longitudinally striate when dry, persistent. Umbel 4–7-flowered. Pedicels unequal, 1.5–4 cm, thickened in fruit, with short teeth along ribs. Perianth stellately spreading, white; segments linear-oblong, 5–7 mm, 1-veined, connate at base into a 1–1.5 mm tube. Filaments 2–2.5 mm, connate to middle and adnate to perianth segments, entire. Ovary flattened globose; ovules 3 or 4 per locule. Style 1–1.5 mm; stigma (2 or)3-lobed.

Forests. Anhui (Chu Xian) [Japan].

137. *Allium neriniflorum* (Herbert) G. Don in Loudon, Encycl. Pl., ed. 1855, 1342. 1855.

长梗合被韭 chang geng he bei jiu

Caloscordum neriniflorum Herbert, Edward's Bot. Reg. 30 (Misc. Matter): 67. 1844; *Nothoscordum neriniflorum* (Herbert) Benth & J. D. Hooker; *N. neriniflorum* var. *albiflorum* Kitagawa.

Bulb solitary, ovoid-globose to subglobose, 1–2 cm in diam.; tunic grayish black, membranous, entire. Leaves equaling to longer than scape, 1–3 mm wide, terete to subterete, fistulose, scabrous-denticulate along angles. Scape (15–)20–50 cm, terete, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbel few flowered. Pedicels unequal, (4.5–)7–11 cm, bracteolate. Perianth stellately spreading, red to purple, rarely white; segments ovate-oblong or narrowly ovate to obovate-oblong, 7–10 \times 2–3.2 mm, connate at base into a 2–3 mm tube, apex obtuse or with a point; inner ones usually longer and wider than outer. Filaments subulate, ca. 1/2 as long as perianth segments, connate at base and adnate to perianth segments for 2–3 mm. Ovary conical-globose, without concave nectaries at base; ovules (5 or)6(–8) per locule. Stigma 3-cleft. Fl. and fr. Jul–Aug. $2n = 16^*$.

Slopes, damp places, meadows, sandy places on coasts; near sea level to 2000 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol [Mongolia, Russia (Far East)].

138. *Allium monanthum* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg 31: 109. 1886.

单花薤 dan hua xie

Allium monanthum var. *floribundum* Z. J. Zhong & X. T. Huang.

Plants dioecious. Bulb solitary, globose, 0.5–1 cm in diam.; tunic yellowish brown, sometimes tinged with red, entire or apex finely reticulate. Leaves 1 or 2, broadly linear, 1.5–2 \times as long as scape, 3–8 mm wide, adaxially flat, abaxially convex, nearly semicircular in cross section, thick, attenuate at both ends. Scape 5–10 cm, slender, terete, covered with leaf sheaths only at base. Spathe 1-valved, persistent. Umbel 2–4(or 5)-flowered in male plants, 1-flowered in female plants. Pedicels subequaling perianth. Perianth white or pale red to dark red. Male flowers: pedicels nearly as thick as scape; perianth segments narrowly oblong or oblong to ovate-oblong, ca. 4 \times 1.4–2(–2.4) mm, apex obtuse, inner ones narrower than outer; filaments narrowly triangular, equaling perianth segments, connate at base and adnate to perianth segments, inner ones wider than outer at base; ovules absent or rarely 1 locule with 1 sterile ovule. Female flowers: pedicels thicker than scape, dilated at apex; perianth segments ovate to ovate-lanceolate, 4–5 \times 1.2–2 mm, apex acute, inner ones narrower than outer; stamens sterile; ovary ellipsoid-globose, without concave nectaries at base; stigma 3-cleft. Fl. May. $2n = 16$, 32.

Forests, slopes. Hebei, Heilongjiang, Jilin, Liaoning [Japan, Korea, Russia (Far East)].

