

## Identification key to *Allium* species in North America

Source: MCNEAL JR., DALE W., & JACOBSEN, T. D. 2002. *Allium* Linnaeus. Pages 224–275 of: FLORA OF NORTH AMERICA EDITORIAL COMMITTEE (ed), *Flora of North America North of Mexico*, vol. 26. New York and Oxford: Oxford University Press.

1. Leaf blade flat, channeled, or  $\pm$  terete, never more than 30 mm wide, (never petiolate).
2. Flowering pedicels mostly or completely replaced by bulbils.
  3. Outer bulb coats persisting as fibrous reticulum; leaf sheaths not extending more than 1/4 scape; spathe bract beakless or beak much shorter than base.
    4. Ovary, when present, crestless; spathe bracts 3–7-veined; east of 103rd meridian ..... *A. canadense*
    4. Ovary, when present, obscurely crested with 6, low, central processes; spathe bracts 1-veined; west of 105th meridian ..... *A. geyeri*
  3. Outer bulb coats membranous, if with fibers these not forming reticulum; leaf sheaths extending to midscape or above; spathe bract with beak equaling or longer than base.
    5. Spathe bract 1, caducous.
      6. Bulbs 1–2 cm diam.; leaf blade 2–4 mm diam., cylindric or filiform, not carinate, hollow below middle ..... *A. vineale*
      6. Bulbs (1.5–)3–8 cm diam.; leaf blade 5–20 mm wide, flat, carinate, solid ..... *A. sativum* var. *sativum*
    5. Spathe bracts 2–5, persistent.
      7. Spathe bracts 2–5, 4–9-veined, beak to 20 cm ..... *A. oleraceum*
      7. Spathe bracts 3–5, 2–3-veined, beak to 10 cm ..... *A. ampeloprasum*
2. Flowering pedicels floriferous, bulbils almost unknown.
  8. Outer bulb coats persisting as fibrous reticulum.
    9. Ovary usually crestless; if obscurely crested, with 3 or 6 processes; east of 103rd meridian.
      10. Spathe bracts usually 1-veined.
        11. Spaces between bulb coat fibers filled in proximal 1/2 bulb; tepals white, pink, or red, rarely greenish yellow; central plains from N Mexico to Nebraska ..... *A. drummondii*
        11. Spaces between bulb coat fibers open; tepals yellow; W Texas ..... *A. coryi*
      10. Spathe bracts 3–7-veined.
        12. Umbel compact; pedicels much shorter than flowers ..... *A. schoenoprasum*
        12. Umbel loose; pedicels longer than flowers.
          13. Flowers substellate to urceolate-campanulate, ultimately withering somewhat and exposing capsule; reticula of bulbs finely or only moderately coarsely meshed.
            14. Bulbs 1–3, narrowly cylindric, attached to  $\pm$  horizontal primary rhizome, often missing or not visible on herbarium specimens; leaf blade carinate; cells of seed coat smooth, shiny; occasional introduction ..... *A. tuberosum*
            14. Bulbs 1–4+, ovoid, not attached to rhizome; leaf blades not carinate, channeled; cells of seed coat each with minute, central papilla; native east of 103rd meridian ..... *A. canadense*
          13. Flowers urceolate, permanently investing capsule; reticula of bulbs usually very coarsely meshed.
            15. Flowering bulbs with cluster of stalked, basal bulbels; cells of innermost bulb coats contorted, with sinuous walls; extreme S Texas ..... *A. runyonii*
            15. Flowering bulbs without basal bulbels; cells of innermost bulb coats vertically elongate, without sinuous walls; W Texas and E New Mexico to C South Dakota ..... *A. perdulce*
      9. Ovary usually crested with 3 or 6 processes; if crestless, from west of 105th meridian.
        16. Ovary and capsule conspicuously crested with 6 contorted or horizontally spreading,  $\pm$  lateral processes; tepals widely spreading to reflexed, SE United States.

- 17. Spathe bracts usually 5–7-veined; ovary crests conspicuously contorted; tepals spreading to reflexed..... *A. cuthbertii*
- 17. Spathe bracts 1-veined; ovary crests flattened, horizontally spreading, not contorted; tepals widely spreading..... *A. speculae*
- 16. Ovary crested with 6 ± erect, often obscure central processes; tepals erect to widely spreading; W North America.
- 18. Leaves 3+ per scape; cells of seed coat each with minute, central papilla.
  - 19. Bulbs often short-rhizomatous basally; spathe bracts 3–5-veined; ovary conspicuously crested with 6 flattened, lacerate central processes; tepals spreading or reflexed, withering in fruit, not investing capsule ..... *A. plummerae*
  - 19. Bulbs not short-rhizomatous; spathe bracts usually 1-veined; ovary obscurely crested with 6 rounded central processes; tepals erect, not withering in fruit, permanently investing capsule.
  - 20. Leaf blade flat, ± falcate, usually 3–6 mm wide; Box Elder County, Utah ..... *A. passeyi*
  - 20. Leaf blade channeled, ± straight, usually less than 5 mm wide; widespread, N Great Plains and W North America..... *A. geyeri*
- 18. Leaves usually 2 per scape; cells of seed coat ± smooth, with or without central papillae.
  - 21. Spathe bracts 3–5-veined; tepals becoming papery in fruit, midrib scarcely thickened, not investing capsule; ovary usually conspicuously crested with 6 flattened central processes, often to 2 mm ..... *A. macropetalum*
  - 21. Spathe bracts 1-veined; tepals becoming callous-keeled, permanently investing capsule; ovary inconspicuously crested with 6 rounded central processes, to 1 mm.
  - 22. Leaf blade flat, ± falcate, usually 3–6 mm wide; cells of seed coat with minute central papilla; Box Elder County, Utah ..... *A. passeyi*
  - 22. Leaf blade semiterete, channeled, ± straight, usually 1–3(–5) mm wide; cells of seed coat smooth; N Great Plains and W North America ..... *A. textile*
- 8. Outer bulb coats membranous to chartaceous, with or without distinct cellular markings (reticulation); without fibers or with some parallel fibers.
  - 23. Scape fistulose, 3–25 mm diam., not flattened and winged; leaves 2–10, blade flat and solid, or fistulose.
  - 24. Leaf blade flat, solid.
    - 25. Leaves not or scarcely sheathing base of scape ..... *A. nigrum*
    - 25. Leaves sheathing 1/3–1/2 scape..... *A. ampeloprasum*
  - 24. Leaf blade fistulose.
    - 26. Bulbs 1–3, to 10 cm diam., ± globose, not rhizomatous; leaf blade semicircular in cross section; occasional escape from cultivation..... *A. cepa*
    - 26. Bulbs 1–2, 5 cm diam., cylindric, clustered on short rhizome (this often missing or not visible on herbarium specimens); leaf blade circular in cross section; native or introduced.
    - 27. Flowers 8–18 mm; tepals lilac to pale purple; native or introduced..... *A. schoenoprasum*
    - 27. Flowers 6–9 mm; tepals pale yellowish white; introduced ..... *A. fistulosum*
- 23. Scape solid, exceeding 5 mm wide only if flattened and winged; leaves 1–several, leaf blade solid.
  - 28. Leaves (3–)5–40 mm wide, basal sheaths extending 1/3–1/2 scape.
    - 29. Filaments unappendaged; leaf blade terete to semiterete; bulbels, if present, light brown ..... *A. paniculatum*
    - 29. Inner filaments appendaged with prominent tooth on each side of anther; leaf blade flat, channeled; bulbels very dark purple ..... *A. rotundum*
  - 28. Leaves 1–25 mm wide, basal sheaths never extending much above soil level.
    - 30. Bulbs oblong, elongate, or ovoid, clustered on stout, primary rhizome, or short-rhizomatous; bulb coats membranous or chartaceous, finely striate with narrow, vertically elongate cells.
    - 31. Bulbs on stout, iris-like rhizome; ovary crestless.

32. Tepals elliptic, apex obtuse; stamens  $\pm$  equaling tepals; EC Arizona and adjacent New Mexico, and Santa Catalina Mountains, S Arizona ... *A. gooddingii*
32. Tepals narrowly lanceolate to lanceolate, apex acuminate; stamens much shorter than tepals or definitely exserted; widespread in W North America, not occurring in Arizona.
33. Stamens and style exserted; stigma capitate; Cascades and Sierras E to NE Nevada, E Oregon, W Idaho ..... *A. validum*
33. Stamens and style ca. 1/2 tepals; stigma 3-lobed; Rocky Mountains from C Montana and NE Idaho to Wyoming, NE Utah, Colorado, and New Mexico ..... *A. brevistylum*
31. Bulbs short-rhizomatous at base, rhizome not stout and iris-like; ovary strongly crested with 6 processes.
34. Stamens and styles included; outer bulb coats  $\pm$  reddish brown, inner coats deep red to white; ovary crested with 6 short, rounded, densely papillose processes ..... *A. haematochiton*
34. Stamens and styles exserted; outer bulb coats gray or brown, inner coats white to pink or reddish; ovary crested with 6 flattened,  $\pm$  triangular processes, margins entire or toothed.
35. Flowers campanulate; tepals  $\pm$  erect; scape nodding ..... *A. cernuum*
35. Flowers stellate; tepals spreading; scape erect, or, if nodding at anthesis, becoming erect ..... *A. stellatum*
30. Bulbs ovoid to subglobose, not clustered on stout, primary rhizome; rhizomes, if present, secondary, arising from bulbs,  $\pm$  slender, terminated by new bulbs; bulb coats without reticulation or with  $\pm$  isodiametric or transversely elongate cells that are sometimes intricately contorted.
36. Leaf 1 per scape; leaf blade terete; ovary prominently crested with 6  $\pm$  triangular processes.
37. Stigma unlobed or minutely 3-lobed, lobes  $\pm$  stout, erect or spreading.
38. Scape 18–60 cm; flowers 5–9 mm; tepals unequal, inner whorl 1/4–1/3 longer than outer, margins entire or irregular to erose; stamens exserted ..... *A. sanbornii*
38. Scape less than 25 cm; flowers 7–20 mm; tepals  $\pm$  equal, margins entire; stamens included.
39. Outer bulb coat reticulate with  $\pm$  elongate, contorted meshes ..... *A. nevadense*
39. Outer bulb coat lacking reticulation, or meshes very indistinct, square or polygonal.
40. Pedicels slender, longer than flowers; flowers 8–12 mm .. *A. atrorubens*
40. Pedicels stout, generally shorter than flowers; flowers 12–20 mm.
41. Tepals lanceolate to lance-linear, apex acute; lacking stalked, basal increase bulbs; rocky, sandy desert slopes, S California to W Arizona ..... *A. parishii*
41. Tepals lance-linear to lanceolate, apex long-acuminate; with 1–2 stalked basal increase bulbs; alpine ridges and talus, S California mountains ..... *A. monticola*
37. Stigma distinctly 3-lobed, lobes often slender and recurved.
42. Stamens equaling tepals or exserted.
43. Tepals unequal, inner 1/3–1/2 longer than outer ..... *A. sanbornii*
43. Tepals  $\pm$  equal ..... *A. howellii*
42. Stamens included.
44. Tepal (at least inner whorl) margins denticulate to erose.
45. Scape 25–40 cm ..... *A. jepsonii*
45. Scape 5–20 cm.
46. Outer bulb coats reddish brown; tepals erect,  $\pm$  straight at tip; inner whorl margins denticulate ..... *A. denticulatum*
46. Outer bulb coats brown to gray; tepals erect,  $\pm$  spreading-reflexed at tip; inner whorl margins denticulate to erose ..... *A. abramsii*
44. Tepal margins all  $\pm$  entire.

- 47. Margins of ovarian crest processes entire or notched at tip, outer margins sometimes irregular but never dentate or laciniate.
- 48. Flowers 10–18 mm; tepals maroon or deep reddish purple.
  - 49. Tepals deep reddish purple, all reflexed at tip; Mount Hamilton Range, C California ..... *A. sharsmithiae*
  - 49. Tepals maroon, outer curled back at tip, inner reflexed; Spanish Needle Peak, S Sierra Nevada, and Horse Canyon, Tehachapi Mountains, California ..... *A. shevockii*
- 48. Flowers 6–9 mm; tepals white to pink, darkening in age.
  - 50. Inflorescence loose; pedicels flexuous in fruit; tepals lanceolate to lance-ovate, apex acuminate ..... *A. parryi*
  - 50. Inflorescence compact; pedicels straight; tepals ovate to nearly round, apex obtuse (rarely acute) to shallowly emarginate ...  
..... *A. munzii*
- 47. Margins of ovarian crest processes dentate to laciniate.
  - 51. Tepals deep reddish purple, erect, usually conspicuously recurved at tip ..... *A. fimbriatum*
  - 51. Tepals white or flushed to pale lavender with darker midveins, spreading or erect, not conspicuously recurved at tip.
    - 52. Flowers usually 6–12 mm ..... *A. fimbriatum*
    - 52. Flowers usually 6–8(–10) mm.
      - 53. Scape 25–50 cm; tepals spreading from base; serpentine soil, Rawhide Hill and Red Hills, foothills of Sierra Nevada, C California..... *A. tuolumnense*
      - 53. Scape 7–20(–30) cm; tepals erect; serpentine clay soils, S Coast Ranges and W Transverse Ranges, California .....  
..... *A. diabolense*
- 36. Leaves usually 2 or more, if 1, blade flattened or broadly channeled; ovary crestless or variously crested.
- 54. Bulbs generally with numerous increase bulbs, these much smaller than parent bulb, enclosed by bulb coats, in basal cluster or on threadlike rhizomes to 10 cm.
  - 55. Ovary crestless or obscurely crested with 3 low central processes.
    - 56. Larger bulbs each with cluster of bulbels surrounding roots; S Texas ..... *A. elmendorfi*
    - 56. Larger bulbs each with cluster of small, basal bulbels on one side; NE Oregon and WC Idaho..... *A. madidum*
- 55. Ovary prominently crested with 6 triangular central processes, margins finely papillose or denticulate.
  - 57. Leaves usually beginning to wither from tip by anthesis; tepals rigid (not papery), ± shiny in fruit, strongly involute at tip, carinate .....  
..... *A. campanulatum*
  - 57. Leaves usually green at anthesis; tepals papery (not rigid and shiny) in fruit, not strongly involute, not carinate.
    - 58. Tepals ovate to elliptic, apex acute to acuminate; foothills of Sierra Nevada, N, C California..... *A. membranaceum*
    - 58. Tepals lanceolate, apex acuminate; Sierra Nevada, California, and intermountain region N to Oregon, Idaho..... *A. bisceptrum*
- 54. Increase bulbs absent or 1–4, ± equaling parent bulbs, enclosed by parental bulb coats, never appearing as basal cluster, not rhizomatous or rhizomes 2+ mm thick (not threadlike).
- 59. Leaf blade channeled to subterete, if flat, not falcate.
  - 60. Bulb coats lacking reticulation or reticulum delicate, very obscure under hand lens.
    - 61. Bulbs ovoid to subglobose; rhizomes absent, renewal bulbs formed within coats of parent bulb; native or introduced.
    - 62. Scape terete throughout, 1–3 mm diam.; leaf blade 1–3 mm wide; native to W Texas to SE Arizona..... *A. kunthii*

62. Scape triquetrous, 2-edged or slightly winged proximally, if terete only proximally so, 1–10 mm wide; introduced in California and Oregon near the Pacific coast.
63. Umbel erect,  $\pm$  hemispheric; flowers  $\pm$  erect; tepals broadly elliptic, apex obtuse . . . . . ***A. neapolitanum***
63. Umbel lax,  $\pm$  1-sided; flowers pendent; tepals lanceolate, apex acute . . . . . ***A. triquetrum***
61. Bulbs oblique or oblique-ovoid, renewal bulbs borne terminally on rhizomes outside coats of parent bulbs; native.
64. Rhizomes conspicuous, 2 cm or more, including renewal bulbs.
65. Rhizomes smooth, parent bulb disappearing by anthesis except for still-functional roots and bulb coat; leaf blade broadly concave-convex or  $\pm$  flattened, carinate; tepals obovate to ovate, apex acute to obtuse or emarginate; Coast Ranges, California, Oregon . . . . . ***A. unifolium***
65. Rhizomes scaly, sometimes absent, often missing in herbarium specimens, parent bulb persisting after anthesis; leaf blade flat, not carinate; tepals lanceolate to oblong, apex acute to acuminate; trans-Pecos Texas to SE Arizona . . . . . ***A. rhizomatum***
64. Rhizomes inconspicuous, 2 cm or less, including renewal bulb.
66. Tepals erect, red-purple, rarely pure white, at least inner tepal margins serrulate; NW California, SW Oregon . . . . . ***A. bolanderi***
66. Tepals  $\pm$  spreading, white to pale pink, margins entire; W Texas to SE Arizona . . . . . ***A. kunthii***
60. Bulb coats obviously reticulate with prominent meshes under hand lens.
67. Cells of outer bulb coat square or polygonal.
68. Ovary with 6 prominent, flat,  $\pm$  triangular crest processes . . . . . ***A. bigelovii***
68. Ovary with 3 or 6 minute, rounded crest processes, or crest obscure.
69. Flowers 4–9 mm; tepals erect or spreading from base, margins entire . . . . . ***A. lacunosum***
69. Flowers 8–16 mm; tepals spreading at tip, inner tepal margins denticulate.
70. Bulb forming 1–3 renewal bulbs borne terminally on rhizomes outside coats of parent bulb; parent bulb disappearing by anthesis except for still-functional roots and shriveled bulb coats; near Weller Butte, Blue Mountains, SE Washington . . . . . ***A. dictuon***
70. Bulbs not forming rhizomes, renewal bulbs formed within coats of parent bulb; widespread W of Rocky Mountains . . . . . ***A. acuminatum***
67. Cells of bulb coat transversely elongate, V-shaped, arranged in  $\pm$  vertical rows, forming herringbone pattern, or  $\pm$  contorted.
71. Cells of bulb coat in wavy, transverse rows, forming indistinct herringbone pattern or  $\pm$  contorted; tepals spreading,  $\pm$  equal.
72. Scape (3–)5–15(–17) cm; umbel persistent; tepals erect, not connivent over capsule in fruit . . . . . ***A. hickmanii***
72. Scape 15–60 cm; umbel shattering, each flower with its pedicel falling as unit; tepals connivent over capsule in fruit.
73. Ovary crested with 6  $\pm$  rectangular lateral processes; umbel compact; pedicel 0.7–2 times perianth . . . . . ***A. amplexens***
73. Ovary crestless or crested with 3 minute, 2-lobed central processes; umbel loose; pedicel 1.5–4 times perianth.
74. Leaf blade to 10 mm wide, channeled or flattened, carinate; inner bulb coats white; tepals becoming papery (not hyaline) after anthesis . . . . . ***A. praecox***

74. Leaf blade 1–3 mm wide, channeled or subterete, not carinate; inner bulb coats light yellow or white; tepals becoming hyaline (not papery) after anthesis . . . . . *A. hyalinum*
71. Cells of bulb coat in sharply serrate, transverse rows, forming distinct herringbone pattern; tepals erect, inner shorter, narrower.
75. Tepals connivent over capsule in fruit, not rigid; umbel shattering in fruit, each flower with its pedicel falling as a unit . *A. serra*
75. Tepals not connivent over capsule, rigid in fruit; umbel persistent.
76. Leaves 3–6, blade arcuate to tortuous; umbel compact; pedicels 5–20 mm; sea cliffs, N, C California . . . . . *A. dichlamydeum*
76. Leaves 2–3, blade straight to arcuate; umbel loose; pedicels 10–40 mm; not on sea cliffs, California Floristic Province, extending south in coastal ranges.
77. Inner tepal margins denticulate, crisped . . . . . *A. crispum*
77. Inner tepal margins entire to denticulate, never crisped . . . . . *A. peninsulare*
59. Leaf blade flat or broadly channeled, if flat,  $\pm$  falcate.
78. Scape and leaves persisting after seeds mature or on pressing, or only tardily deciduous.
79. Stamens much shorter than tepals.
80. Bulb coat cellular-reticulate with elongate,  $\pm$  obscure, intricately contorted cells (resembling *Allium madidum*, but never with cluster of basal bulbels) . . . . . *A. fibrillum*
80. Bulb coat cellular-reticulate with  $\pm$  narrowly hexagonal, transversely elongate cells . . . . . *A. brandegeei*
79. Stamens equaling tepals or exerted.
81. Scape expanded proximal to inflorescence; leaf blade (2–)5–8 mm wide . . . . . *A. columbianum*
81. Scape thickest immediately proximal to inflorescence; leaf blade 1–5(–15) mm wide.
82. Scape constricted just proximal to inflorescence, then expanded; leaf blade 1–3(–5) mm wide. . . . . *A. constrictum*
82. Scape not expanded proximal to inflorescence; leaf blade 2–5(–15) mm wide.
83. Leaf blade usually more than 5 mm wide, flat; umbel 25–50-flowered; spathe bracts 3 . . . . . *A. douglasii*
83. Leaf blade 2–3 mm wide, flat to channeled; umbel 10–30-flowered; spathe bracts 2.
84. Bulb coat with quadrate to polygonal reticulations; leaf blade  $\pm$  equaling scape . . . . . *A. nevii*
84. Bulb coat without reticulations or with 2–3 rows of  $\pm$  quadrate cells just distal to roots; leaf blade exceeding scape . . . . . *A. macrum*
78. Scape and leaves forming abscission layer at soil surface and deciduous when seeds mature, also frequently breaking at soil surface after pressing.
85. Outer bulb coats cellular-reticulate throughout (often obscurely so in *A. aaseae* and *A. simillimum*).
86. Bulb coats obscurely cellular-reticulate with  $\pm$  contorted cells; tepal margins denticulate to erose.
87. Tepals white with greenish or reddish veins, sometimes flushed pink; anthers purple or mottled purple and white; pollen white or gray . . . . . *A. simillimum*
87. Tepals bright pink, rarely white; anthers yellow; pollen yellow . . . . . *A. aaseae*
86. Bulb coats  $\pm$  prominently cellular-reticulate; tepal margins entire.

- 88. Bulb coats reticulate, cells irregularly arranged,  $\pm$  polygonal, rectangular, or transversely elongate,  $\pm$  curved.
- 89. Cells of bulb coat irregularly arranged,  $\pm$  transversely elongate, curved; Tuolumne County, C California ..... *A. tribracteatum*
- 89. Cells of bulb coat irregularly arranged or in  $\pm$  regular vertical rows, polygonal or  $\pm$  rectangular; Sierra Nevada, California, and Nevada ..... *A. obtusum*
- 88. Bulb coats reticulate, cells arranged in  $\pm$  regular vertical rows, narrowly hexagonal to rectangular, transversely elongate.
- 90. Tepals linear-lanceolate ..... *A. anceps*
- 90. Tepals oblanceolate to ovate.
- 91. Scape 3–10 cm; pedicel  $\pm$  equaling perianth ... *A. punctum*
- 91. Scape 15–20 cm; pedicel 2–3 times perianth ... *A. lemmonii*
- 85. Outer bulb coats not cellular-reticulate or with 2–3 rows of cells just distal to roots.
- 92. Scape terete or  $\pm$  compressed, not winged.
- 93. Stamens well included.
- 94. Stamens  $\pm$  equaling tepals or exerted.
- 95. Leaf blade strongly falcate; umbel mostly 5–10-flowered ..... *A. parvum*
- 95. Leaf blade linear or weakly falcate; umbel 20–30-flowered ..... *A. cratericola*
- 94. Leaves 2 per scape.
- 96. Leaf 1 per scape.
- 97. Leaf blade  $\pm$  equaling to 2 times scape; WC Idaho ..  
..... *A. tolmiei*
- 97. Leaf blade much longer than scape; C Sierra Nevada, California ..... *A. yosemitense*
- 96. Filaments papillose proximally ..... *A. hoffmanii*
- 93. Filaments smooth proximally ..... *A. burlewii*
- 92. Scape flattened, 2-edged or usually winged distally.
- 98. Bulbs oblique or oblique-ovoid, renewal bulbs borne terminally on rhizomes outside coats of parent bulb; parent bulb disappearing by anthesis except for still-functional roots and shriveled bulb coat.
- 99. Pedicel  $\pm$  equaling perianth; ovary obscurely 3-crested; barren, bald summits W of Cascade Mountains from Vancouver Island to SW Oregon, also at Jefferson Park, Oregon, and in Wenatchee Mountains, C Washington ..... *A. crenulatum*
- 99. Pedicel 2–3 times perianth; ovary prominently 6-crested; mountains and scablands E of Cascade Mountains, Oregon ..... *A. tolmiei*
- 98. Bulbs ovoid to subglobose, rhizomes absent, renewal bulbs formed within coats of parent bulb; parent bulbs persistent.
- 100. Tepals narrowly lanceolate, apex long-acuminate; stamens exerted ..... *A. platycaule*
- 100. Tepals lanceolate to ovate or elliptic, apex obtuse to acuminate; stamens included.
- 101. Flowers 9–15 mm; tepal apex long-acuminate, inner margins usually denticulate ..... *A. falcifolium*
- 101. Flowers 6–10(–12) mm; tepal apex obtuse to acute, or  $\pm$  involute in age and appearing acuminate, inner margins denticulate or not.
- 102. Inner bulb coats usually pink or red; inner tepal margins sometimes  $\pm$  denticulate; Siskiyou Mountains of NW California and SW Oregon ..... *A. siskiyouense*

- 102. Inner bulb coats white; inner tepal margins entire; W United States, E of Sierra-Cascade axis.
- 103. Tepals becoming rigid (not papery), carinate in fruit.
  - 104. Tepals lanceolate, apex acute to acuminate,  $\pm$  erect in fruit, involute at tip; ovary obscurely to prominently crested with 3 or 6 processes ..... *A. tolmiei*
  - 104. Tepals elliptic-oblong, apex obtuse, not involute at tip, connivent over ovary in fruit; ovary crestless or obscurely crested ..... *A. scilloides*
- 103. Tepals becoming papery (not rigid), not carinate in fruit.
  - 105. Ovary distinctly crested with 3 or 6 low processes; sand and gravel deposits, along Columbia River from Ferry County, NE Washington, to mouth of John Day River, NC Oregon ..... *A. robinsonii*
  - 105. Ovary obscurely crested with 3 low, rounded processes; rocky, clay slopes and talus, E Oregon, Idaho, to C California, N Nevada, NW Utah .. *A. parvum*
- 1. Leaf blade flat, 15–90 mm wide, (tapering to base or distinctly petiolate).
  - 106. Leaves ephemeral, usually absent at anthesis; E North America ..... *A. tricoccum*
  - 106. Leaves present at anthesis; Attu and Unalaska islands, Alaska ..... *A. victoralis*