

or less reduced; wings of the fruit averaging narrower than in *C. purpurascens*, the lateral ones mostly 1–2 (3) mm wide.

In sandy or clay soil, in the foothills and valleys, often with *Artemisia* or *Atriplex*, tolerant of alkali, 1500–2000 m; Canyonlands and Uinta Basin sections of Utah, ne. to s. Wyo., e. to Colo., and s. to ne. Ariz. (Navajo Co.), N.M., and w. Texas; overlapping the range of *C. purpurascens* in the Uinta Basin and Canyonlands, but apparently distinct. Apr. May.

### 31. *Cymopterus purpurascens* (A. Gray) M. E. Jones

*Cymopterus montanus* var. *purpurascens* A. Gray in Ives, Rep. Colorado R. 4: 15. 1861. *C. purpurascens* (A. Gray) M. E. Jones, Zool. 4: 277. 1893. *Phelopterus purpurascens* (A. Gray) J. M. Coulter & Rose, Contr. U.S. Natl. Herb. 7: 168. 1900. (*J. S. Newberry* s.n., Oryabe, N.M. [now in Navajo Co., Ariz.]; holotype at GH!)

*C. utahensis* M. E. Jones, Proc. Calif. Acad. Sci. II, 5: 684. 1895. *Phelopterus utahensis* (M. E. Jones) Wooton & Standl., Contr. U.S. Natl. Herb. 16: 158. 1913. (M. E. Jones 5098, top of grade above Pagumpa, Ariz., is the first of three collections cited; original material at POM!, where labeled var. *monocephalus* in Jones' hand.)

*C. utahensis* var. *monocephalus* M. E. Jones, Proc. Calif. Acad. Sci. II, 5: 685. 1895. (M. E. Jones s.n., Terminus, Utah, 6 May 1890; holotype at POM!)

Basin white-cup spring-parsley.

Glabrous perennial with a stout, fleshy-thickened taproot and subterranean, simple or sometimes 2- or 3-headed crown, each crown giving rise to 1 or more short to evident pseudoscapes with a rosette of leaves at the surface of the ground; peduncles 1 to several, 3–10 cm long at maturity; leaves somewhat fleshy, gray-green or blue-green, appearing glaucous, the blade from equaling or a little shorter to sometimes evidently longer than the petiole, mostly 2–6 cm long, evidently longer than wide, varying to about as wide as long, ovate to elliptic-oblong in outline, rather openly 2–3 times pinnately dissected, the primary or at least the secondary pinnae tending to have a more or less expanded midstrip; primary umbel with several short rays up to 1.5 (reputedly to 2.5) cm long at maturity, the dense fruiting umbel lying on the ground; involucle of a few irregularly developed, scarious, whitish or somewhat anthocyanic, often basally connate bracts, or the involucle reduced and virtually obsolete, the involucel of several prominent, broadly elliptic or elliptic-obovate, distally broadly rounded bracts 5–10 mm long, these tending to be connate toward the base, striately multinerved, the body tending to be chlorophyllous as well as anthocyanic; flowers purplish, short-pedicellate (1 mm) or virtually sessile at anthesis, the pedicels scarcely elongating in fruit; carpophore wanting; fruit 10–16 mm long, broadly multiwinged, the wings commonly 4–7 mm wide, plane or a little wavy, the oil-tubes 3–9 in the intervals, 5–12 on the commissure.

Sandy to limy, sometimes rocky soil at lower elev., often with *Larrea*, or sometimes with sagebrush, up to 1800 m; s. Calif. to w. Texas and n. Mex., n. to s. Utah (notably Kane and Washington cos.). Mar. Apr.

Open places in the valleys and foothills, commonly with sagebrush, 1300–2300 m; se. and sc. Idaho (Bannock and Twin Falls cos.) in and w. of the Wasatch region (s. to Sevier and Beaver cos.), but also in the Uinta Basin and Canyonlands, even as far e. as Blanding, Mar.–May.

A few plants from Sevier, Piute, and Millard cos. appear to be intermediate toward *C. multinervatus*.

### 32. *Cymopterus multinervatus* (J. M. Coulter & Rose) Tidestr.

*Phelopterus multinervatus* J. M. Coulter & Rose, Contr. U.S. Natl. Herb. 7: 169. 1900. *Cymopterus multinervatus* (J. M. Coulter & Rose) Tidestr., Proc. Biol. Soc. Wash. 48: 41. 1935. (*J. G. Lemmon* & *S. A. P. Lemmon* 80-111, Peach Springs, Ariz., May 1884; holotype at US!)

Striate spring-parsley.

Glabrous perennial with a stout, fleshy-thickened taproot and deep-seated to sometimes superficial root-crown, accordingly with or without a pseudoscape; peduncles usually several, mostly 7–15 cm long at maturity, lax; leaves all basal (or clustered on the pseudoscape), forming a spreading rosette on the surface of the ground, somewhat fleshy, gray-green, appearing glaucous, the blade from equaling or a little shorter to sometimes a little longer than the petiole, mostly 3–8 cm long, evidently longer than wide to about as wide as long, triangular-ovate in outline, rather openly 2–3 times pinnately dissected, the basal pair of pinnae the largest, the primary or at least the secondary pinnae tending to have a more or less expanded midstrip; primary umbel with several short rays up to 1.5 (reputedly to 2.5) cm long at maturity, the dense fruiting umbel lying on the ground; involucle of a few irregularly developed, scarious, whitish or somewhat anthocyanic, often basally connate bracts, or the involucle reduced and virtually obsolete, the involucel of several prominent, broadly elliptic or elliptic-obovate, distally broadly rounded bracts 5–10 mm long, these tending to be connate toward the base, striately multinerved, the body tending to be chlorophyllous as well as anthocyanic; flowers purplish, short-pedicellate (1 mm) or virtually sessile at anthesis, the pedicels scarcely elongating in fruit; carpophore wanting; fruit 10–16 mm long, broadly multiwinged, the wings commonly 4–7 mm wide, plane or a little wavy, the oil-tubes 3–9 in the intervals, 5–12 on the commissure.

Sandy to limy, sometimes rocky soil at lower elev., often with *Larrea*, or sometimes with sagebrush, up to 1800 m; s. Calif. to w. Texas and n. Mex., n. to s. Utah (notably Kane and Washington cos.). Mar. Apr.

### 25. LOMATIUM Raf.

Taprooted perennial herbs, the root sometimes short and tuberous-thickened, sometimes more elongate and cylindric or moniliform, sometimes woody and surmounted by a branching caudex; leaves in most species mostly or all basal (but with some notable exceptions), pinnately to ternately or in part quinately compound to dissected, the ultimate segments varying from large and leaflet-like to more often small and more or less confluent; inflorescence of compound umbels; involucle wanting or inconspicuous, the involucel of evident to inconspicuous bractlets, or less often wanting; flowers mostly yellow or (less often) white, sometimes purple; calyx teeth minute or obsolete, or in a few species (notably some of the *Cynomarathrum* group) fairly well developed; stylopodium scarcely developed, sometimes visible in fresh flowers, but generally obscure or wanting in dried specimens or in fruit; carpophore bifid to the base; fruit narrowly oblong to orbicular or obovate.

glabrous to hairy or granular-roughened, dorsally flattened (parallel to the commissure) and with more or less well developed marginal wings that are typically thin but sometimes coky-thickened, the dorsal ribs evident to obsolete, often raised, but only very narrowly (if at all) winged, the oil-tubes solitary to several in the intervals, 2 to several on the commissure, sometimes obscure.

A genus of about 70 species of w. and c. N. Amer. (Name from the Greek *loma*, a border, referring to the winged fruit.) The taxonomy of *Lomatium* is notoriously difficult. Some of the more widespread species, in particular, are highly variable and have been unduly divided, but when broadly conceived they are mostly fairly well defined. I have never seen a *Lomatium* in the field that I took to be a hybrid. The greater problem comes from the fact that the different species present so many combinations of characters that a satisfactory key is more than ordinarily difficult to devise. Fruits are often necessary for accurate identification, and sometimes flowers are needed as well. The flowers of several species soon fade from yellow to white in the herbarium, causing further confusion.

A number of species of *Lomatium* have thickened roots that were used as food by the Indians. These species are collectively known as biscuit-roots. The Indian names for some of them have found their way into the botanical literature and are here retained.

#### References:

- Mathias, M. E. 27 Dec 1937 (on the title page); Feb 1938 (on the cover). A revision of the genus *Lomatium*. Ann. Missouri Bot. Gard. 25: 225-297.  
 Schlessman, M. A. 1984. Systematics of tuberous lomatiums (Umbelliferae). Syst. Bot. Monogr. 4: 1-55.  
 Theobald, W. L. 1966. The *Lomatium dasyarpum-mohavense-feniculaceum* complex (Umbelliferae). Brittonia 18: 1-18.

- 1 Ultimate segments of the leaves relatively broad, mostly 5-40 (60) mm wide, often forming definite leaflets.
- 2 Involucel wanting; herbage glabrous . . . . . 28. *L. nudicaule*
- 2 Involucel of evident slender bractlets; stems and peduncles (and often also the leaves) finely spreading-hirtellous, varying to rarely glabrous . . . . . 27. *L. triternatum*
- 1 Ultimate segments of the leaves smaller, not more than about 5 mm wide, in most species not forming definite leaflets.
- 3 Wings of the fruit narrow (up to about 1 mm wide) and coky-thickened; very robust plants, mostly 5-15 (20) dm tall at maturity, with the leaves ternate-pinnately dissected into numerous small segments up to about 1 (2) cm long; involucel well developed (*Leptotaenia*) . . . . . 1. *L. dissectum*
- 3 Wings of the fruit variously narrow or broad, but not coky-thickened; mostly less robust plants, rarely more than 5 dm tall except in large forms of *L. ambiguum* and *L. triternatum*, the former without an involucel, the latter with relatively few and large ultimate leaf segments mostly 1-10 (20) cm long.
- 4 Taproot surmounted by a branching, multicapitital caudex, with numerous tufts of basal leaves, persistent old leaf bases, and several or many stems or scapes (*Cynomarathrum*).
- 5 Leaves mostly only once pinnatifid, or some of them subpinnatifid or entire.
- 6 Plants of rush-like habit, the leaves with few (1-7) much elongate segments; fruit 6-8.5 mm wide; local from Emery and e. Sevier cos. to Garfield Co., Utah . . . . . 5. *L. junceum*
- 6 Plants not rush-like, the leaves with either shorter or more numerous segments; fruit up to about 5 mm wide.
- 7 Rays of the umbel mostly (1.5) 2-4 cm long in fruit; var. *alpinum* of . . . . . 2. *L. graveolens*
- 7 Rays of the umbel up to about 1.5 cm long in fruit.
- 8 Plants very dwarf, the leaves and scapes usually not more than about 5 cm long; leaf segments mostly 2-10 mm long and 1-2 mm wide; fruit 4-7 mm long; local in Garfield, Kane, and Iron cos., Utah . . . . . 3. *L. minimum*
- 8 Plants larger, most or all of the leaves and scapes more than 6 cm long, the leaves up to 18 cm long, the scapes up to 25 cm long in fruit; leaf segments mostly 5-40 mm long and 2-7 (10) mm wide; fruit 8-10 mm long; local in Grand and San Juan cos., Utah, and adjacent Colo. . . . . 4. *L. latilobum*
- 5 Leaves mostly bipinnatifid or subtripinnatifid (or in part ternate).
- 9 Leaf segments very slender, up to about 0.5 mm wide, typically very numerous (several hundred to a thousand or more), but less numerous in var. *depauperatum* . . . . . 9. *L. grayi*
- 9 Leaf segments wider, mostly 0.5-2 mm wide, not so numerous as in *L. grayi*.
- 10 Herbage finely spreading-hirtellous or hirtellous-puberulent.
- 11 Leaf segments relatively large, the longer ones mostly 1-3 cm long; local in se. Oregon and adjacent Nev. and Idaho . . . . . 6. *L. packardiae*
- 11 Leaf segments much smaller, mostly 1-3 mm long; widespread . . . . . 10. *L. foeniculaceum*
- 10 Herbage glabrous or scabrous, not spreading-hirtellous or hirtellous-puberulent.
- 12 Pedicels elongate, mostly 8-17 mm long at maturity; wings of the fruit nearly or fully as wide as the body or even wider . . . . . 8. *L. parryi*
- 12 Pedicels shorter, or wings of the fruit evidently narrower than the body, or the plants often differing from *L. parryi* in both of these features.
- 13 Leaf segments short, up to about 5 mm long; local in sw. Utah and adjacent Ariz. and Nev. . . . . 7. *L. scabrum*
- 13 Leaf segments elongate, many of them well over 5 mm long (typically 1-7 cm); fairly widespread in the mts. of our range . . . . . 2. *L. graveolens*

- 4 Taproot (or tuberous-thickened root) surmounted by a simple or sometimes few-branched crown or short caudex, the stems or scapes solitary or few, the old leaf bases in most species not conspicuously persistent.
- 14 Herbage evidently puberulent or spreading-hirtellous.
- 15 Pedicels very short, only 1–2 (3) mm long at maturity; fruit narrow (2–3 mm wide) and elongate, very narrowly or scarcely winged; occasional forms of ... 24. *L. leptocarpum*
- 15 Pedicels longer, or fruit broader and more winged, the plants often differing from the former group in all of these features.
- 16 Flowers white, or sometimes ochroleucous.
- 17 Bractlets of the involucel villous-puberulent, not markedly scarious-margined; fruit (7) 10–20 (28) mm long, (1.8) 2–5 times as long as wide ..... 12. *L. macrocarpum*
- 17 Bractlets of the involucel glabrous or very finely hirtellous, evidently scarious-margined (or largely scarious); fruit mostly 6–10 mm long, usually less than twice as long as wide.
- 18 Leaves with relatively few and very unequal ultimate segments, the larger segments 1 cm long or more; var. *parishi* of ..... 13. *L. nevadense*
- 18 Leaves with numerous, not very unequal ultimate segments all generally well under 1 cm long.
- 19 Leaves pinnately dissected, the basal pair of pinnae the largest, but mostly sessile or short-stalked, the stalk seldom over 1 cm long; widespread in the w. and s. portions of our range, but not in the area of *L. juniperinum* ..... 13. *L. nevadense*
- 19 Leaves distinctly ternate-pinnately dissected, the basal pair of pinnae not only evidently the largest but also conspicuously stalked, the stalk in well developed leaves mostly 1–3 (4) cm long; ne. and c. Utah and adjacent sw. Wyo. and nw. Colo., s. in Utah to n. Grand, Carbon, n. Sanpete, and e. Juab (Mt. Nebo) cos. ..... 14. *L. juniperinum*
- 16 Flowers yellow.
- 20 Leaf segments elongate, most or all of them 1–10 cm long, or even longer; common and widespread species ..... 27. *L. triternatum*
- 20 Leaf segments shorter, rarely any of them as much as 1 cm long.
- 21 Ovaries and fruits evidently (and usually densely) short-hairy.
- 22 Bractlets of the involucel evidently puberulent or spreading-hirtellous.
- 23 Petioles mostly shorter than the blades; widespread in our range ..... 10. *L. foeniculaceum*
- 23 Petioles equaling or mostly longer than the blades; southwestern species, barely entering our range ..... 11. *L. mohavense*
- 22 Bractlets of the involucel glabrous or nearly so; rare forms of .... 15. *L. austiniæ*
- 21 Ovaries and fruits glabrous or nearly so.
- 24 Leaf segments blunt; petioles not so conspicuously dilated as in the next species; w. Nev. and adjacent Calif. ..... 15. *L. austiniæ*
- 24 Leaf segments acute or apiculate; petioles short and conspicuously dilated for their whole length (or nearly so); sw. Wyo. and ne. Utah ..... 14. *L. juniperinum*
- 14 Herbage glabrous or sometimes scabrous, but not puberulent or spreading-hirtellous.
- 25 Involucel wanting; fruit narrowly winged, the wings generally well under 1 mm wide; pedicels 4–13 mm long at maturity ..... 26. *L. ambiguum*
- 25 Involucel present; other characters various, but seldom combined as in *L. ambiguum*.
- 26 Bractlets of the involucel notably wide and conspicuous, broadly oblanceolate to broadly ovate or elliptic; pedicels very short, commonly only 1–3 mm long at maturity ..... 23. *L. couesii*
- 26 Bractlets of the involucel narrower, mostly linear or lanceolate, or if nearly as wide as in *L. couesii*, then the fruiting pedicels more than 3 mm long.
- 27 Fruit narrow and elongate, 6–13 mm long, 2–3 (5) mm wide, very narrowly or scarcely winged, on very short pedicels only 1–2 (3) mm long.
- 28 Leaves very finely dissected, the numerous filiform segments mostly 2–7 mm long and about 0.5 mm wide or less; n. Utah, se. Idaho, and sw. Wyo. ..... 25. *L. bicolor*
- 28 Leaves less dissected, the larger segments mostly (5) 10–50 mm long and 1 mm wide or wider; not of Utah, se. Idaho, or sw. Wyo. .... 24. *L. leptocarpum*
- 27 Fruit broader and often more broadly winged, or the pedicels more than 3 mm long, the plants often differing from the previous group in all of these respects.

- 29 Ultimate segments of the leaves relatively few and large, most or all of them more than 1 cm long ..... 27. *L. triternatum*
- 29 Ultimate segments of the leaves relatively numerous and small, rarely any of them as much as 1 cm long.
- 30 Root more or less elongate, slender to rather stout, but not tuberous-thickened.
- 31 Leaf segments very narrow (about 0.5 mm wide or less) and typically very numerous, several hundred to a thousand or more (fewer but still very narrow in var. *depauperatum*); common and widespread in our range ..... 9. *L. grayi*
- 31 Leaf segments wider (the larger ones generally 1 mm wide or more) and less numerous; plants (except *L. juniperinum*) of the nw. part of our range.
- 32 Leaves bright green, not glaucous.
- 33 Plants inconspicuously or scarcely caulescent; leaf segments acute or apiculate; mts. of Utah ..... 14. *L. juniperinum*
- 33 Plants distinctly caulescent; leaf segments commonly blunt; e. Oregon and adjacent Idaho to nw. Nev. and ne. Calif. ....
- ..... 16. *L. vaginatum*
- 32 Leaves blue-glaucous or grayish.
- 34 Ultimate segments of the leaves blunt or rounded; fruit 5–10 mm long ..... 17. *L. donnellii*
- 34 Ultimate segments of the leaves sharply acute or acuminate; fruit 12–15 mm long ..... 18. *L. peckianum*
- 30 Root short and tuberous-thickened; plants mainly of the nw. part of our range.
- 35 Flowers yellow (sometimes aging white in *L. roseanum*); fruit only very narrowly winged.
- 36 Plants acaulescent, the peduncles (scapes) short, at maturity about 1 dm long and curved to the ground ..... 20. *L. hendersonii*
- 36 Plants larger and somewhat caulescent, mostly well over 1 dm tall ..... 19. *L. roseanum*
- 35 Flowers white with purple anthers; fruit evidently winged.
- 37 Pedicels well developed, mostly 4–15 mm long at maturity; fruit mostly 6–10 mm long ..... 21. *L. canbyi*
- 37 Pedicels very short, seldom as much as 3 mm long at maturity; fruit mostly 5–7 mm long ..... 22. *L. gormanii*

### 1. *Lomatium dissectum* (Nutt.) Mathias & Constance

*Leptotaenia dissecta* Nutt. in Torr. & A. Gray, Fl. N. Amer. 1: 630. 1840. *Ferula dissecta* (Nutt.) A. Gray, Proc. Amer. Acad. Arts 7: 348. 1868. *Lomatium dissectum* (Nutt.) Mathias & Constance, Bull. Torrey Bot. Club 69: 246. 1942. (*T. Nuttall s.n.*, plains of the Oregon, near the confluence of the Wahlamet; holotype at BM!)

*Leptotaenia multifida* Nutt. in Torr. & A. Gray, Fl. N. Amer. 1: 630. 1840. *Ferula multifida* (Nutt.) A. Gray, Proc. Amer. Acad. Arts 7: 348. 1868. *Leptotaenia dissecta* var. *multifida* (Nutt.) Jeps., Madroño 1: 145. 1923. *Lomatium dissectum* var. *multifidum* (Nutt.) Mathias & Constance, Bull. Torrey Bot. Club 69: 246. 1942. (*T. Nuttall s.n.*, plains of the Oregon, east of Wallawalla, and in the Blue Mts.; holotype at BM!)

*Leptotaenia eatoni* J. M. Coulter & Rose, Rev. N. Amer. Umbell. 52. 1888. *Leptotaenia multifida* var. *eatoni* (J. M. Coulter & Rose) M. E. Jones, Contr. W. Bot. 12: 40. 1908. *Lomatium dissectum* var. *eatoni* (J. M. Coulter & Rose) Cronquist, Univ. Wash. Publ. Biol. 17(3): 551. 1961. (*D. C. Eaton* 147, Utah.)

Giant lomatium.

Robust perennial from an often very large, woody taproot that may be surmounted by a branching caudex, mostly 5–15 (20) dm tall at maturity; stems several, stout, glabrous, usually ascending rather than strictly erect; leaves large, basal and cauline, the lower

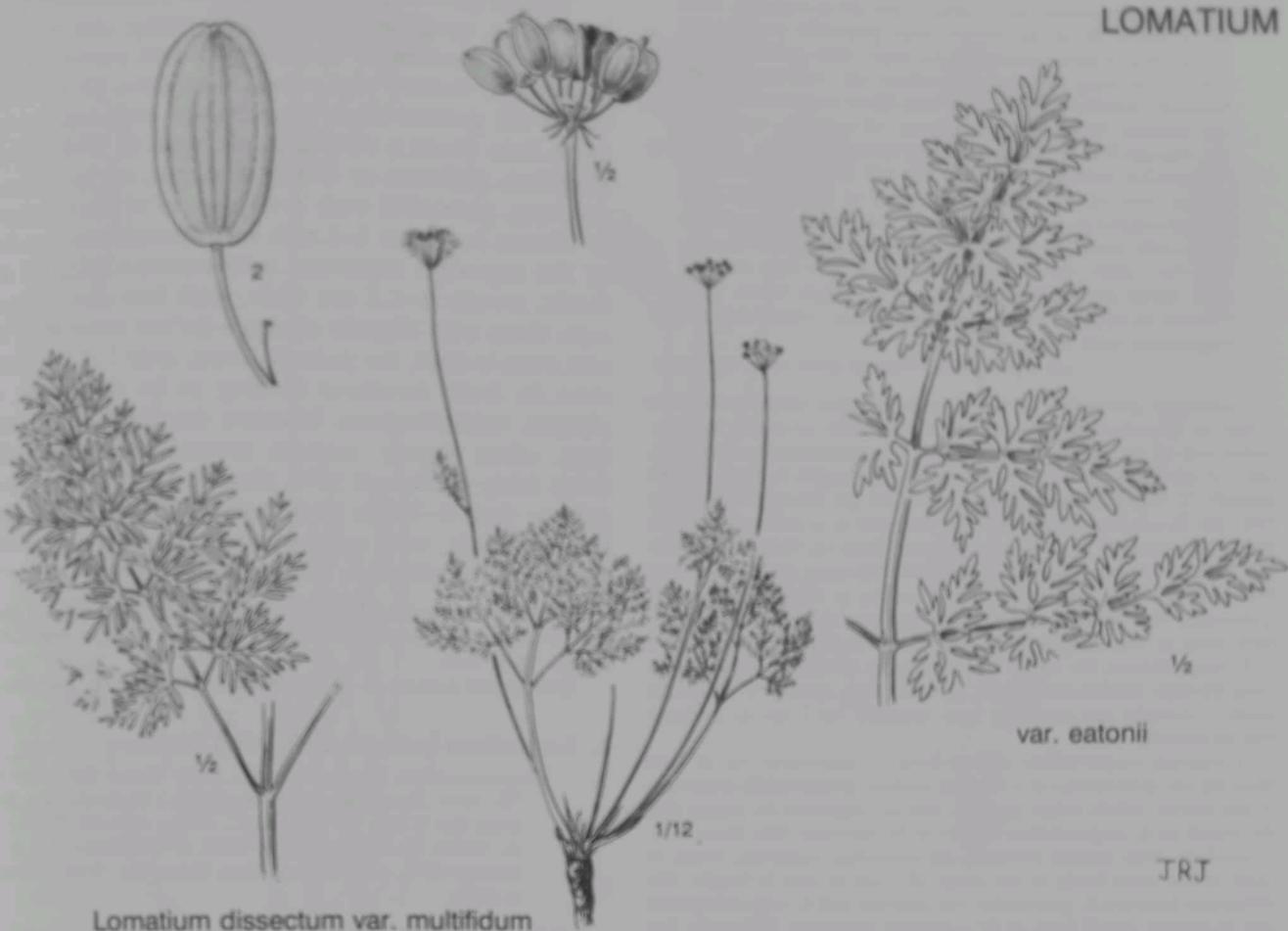
ones the largest, all generally more or less scaberulous, seldom glabrous, ternate-pinnately dissected into small and often narrow ultimate segments up to about 1 (2) cm long; rays of the umbel mostly 10–30, equal or unequal, well developed at anthesis, so that the umbelllets are clearly distinct, at least the longer rays mostly 4–10 cm long at maturity; *involucel* of well developed narrow bractlets; flowers yellow or sometimes purple, always some of them sterile, the fruiting pedicels in our vars. well developed, mostly 4–20 mm long; fruit elliptic, 8–17 mm long and 4.5–10 mm wide, the wings narrow (up to about 1 mm wide) and more or less cory-thickened, the dorsal ribs inconspicuous, the oil-tubes obscure;  $2n = 22$ .

Open, often rocky slopes and dry meadows, often on talus, from the foothills and plains to middle elev. (2600 m) in the mts.; s. Alta. and B.C. to Colo., Ariz., and s. Calif. Apr-June.

The species consists of three wholly confluent geographic varieties two in our range. Variety *dissectum*, with sessile or very shortly pedicellate fruits, occurs chiefly in and west of the Cascade Range and in northern Idaho. Our two varieties, with more evident pedicels, may be characterized as follows:

- 1 Leaves very finely dissected, the very numerous ultimate segments mostly linear and 0.5–1.5 (2) mm wide; s. B.C. and Alta. to n. Wyo., c. Idaho, and c. Oregon, and occasionally to n. Nev. and s. Idaho ..... *var. multifidum* (Nutt.) Mathias & Constance

## LOMATIUM



Lomatium dissectum var. multifidum

var. eatonii

TRJ

1 Leaves less finely dissected, the ultimate segments tending to be fewer, broader, and more confluent, the larger segments mostly (1.5) 2–4 mm wide; the common var. in our range, occurring from s. Wyo., s. Idaho, and c. and ne. Oregon to Colo., Ariz., Nev., and s. Calif.  
..... var. *eatonii* (J. M. Coulter & Rose) Cronquist

**2. *Lomatium graveolens* (S. Watson) Dorn & R. L. Hartm.**

*Peucedanum graveolens* S. Watson, Botany [Fortieth Parallel] 128. 1871. *Peucedanum kingii* S. Watson, Proc. Amer. Acad. Arts 22: 474. 1887. *Lomatium kingii* (S. Watson) Cronquist, Great Basin Naturalist 46: 254. 1986. *L. graveolens* (S. Watson) Dorn & R. L. Hartm., Madroño 35: 71. 1988. (*S. Watson* 463, Wasatch and Uinta mts., Utah; holotype at US!)

*Peucedanum graveolens* var. *alpinum* S. Watson, Botany [Fortieth Parallel] 129. 1871. *Peucedanum kingii* var. *alpina* (S. Watson) J. M. Coulter & Rose, Rev. N. Amer. Umbell. 71. 1888. *Cynomarrathrum alpinum* (S. Watson) J. M. Coulter & Rose, Contr. U.S. Natl. Herb. 7: 245. 1900. *Cogswellia nuttallii* var. *alpina* (S. Watson) M. E. Jones, Contr. W. Bot. 12: 32. 1908. *L. alpinum* (S. Watson) J. F. Macbr., Contr. Gray Herb. 56: 35. 1918. *L. nuttallii* var. *alpinum* (S. Watson) Mathias, Ann. Missouri Bot. Gard. 25: 279. 1937. *L. kingii* var. *alpinum* (S. Watson) Cronquist, Great Basin Naturalist 46: 255. 1986. *L. graveolens* var. *alpinum* (S. Watson) Dorn & R. L. Hartm., Madroño 35: 71. 1988. (*S. Watson* 464, East Humboldt [Ruby] Mts., Nev.; holotype at US!)

*L. graveolens* var. *clarkii* S. L. Welsh, Mem. New York Bot. Gard. 64: 126. 1990. (*L. C. Higgins* 18293, West Rim Trail, Zion Canyon, Washington Co., Utah; isotype at NY!) = var. *alpinum*.

**Stinking lomatium.**

Notably malodorous plants with a stout taproot surmounted by a branching, multipeltate caudex, form-

ing large clumps with numerous clusters of basal leaves and persistent old leaf bases that tend to become coarsely fibrous, glabrous throughout, sometimes slightly glaucous; *scapes* ascending to often erect, well surpassing the leaves at least in fruit; *leaves* all basal, openly once or twice pinnatifid or ternate-pinnatifid, with relatively few, elongate, linear ultimate segments mostly 1–7 cm long and 1–2 mm wide, or some of the segments (especially in var. *alpinum*) shorter but still linear; *inflorescence* small at anthesis, seldom over 3 cm wide, the umbelllets crowded but evidently distinct, the rays elongating in fruit and becoming (1.5) 2–4 cm long, not very unequal, the pedicels 2–7 mm long in fruit; *involucel* well developed, tending to be somewhat dimidiate or oblique, its bractlets green or partly scarious or anthocyanic, linear-attenuate, mostly 3–10 mm long, sometimes some of them connate at the base; *calyx lobes* small but sometimes evident at 10×, about 0.5 mm long or less; *petals* yellow, or in var. *alpinum* sometimes purple (but the anthers still yellow); *fruit* oblong, 7–12 mm long, the wings up to about 1 mm wide, distinctly narrower than the body, the oil-tubes 3–5 in the intervals, 6–10 on the commissure, but often not readily visible through the pericarp.

Open, rocky slopes at middle and upper elev. (2100–3100 m) in the mts., often on limestone; Utah, e. Nev., se. Idaho (Bear Lake Co. to se. Bonneville Co.), and w. Wyo. June, July.

*Lomatium graveolens* consists of two well marked, geographically segregated varieties, the ranges of which overlap in central Utah. Even outside the area where both occur, some of the smaller plants of var. *graveolens* might be mistaken for var. *alpinum* in the absence of geographic data.

fairly well developed leaves below the middle; *peduncles* elongate, curved-ascending to erect, often 1 or more axillary ones curved-ascending and a terminal one more erect; *leaves* ternate-pinnately 2 to several times dissected into mostly linear and elongate, often very unequal segments mostly 0.5–2 mm wide, the longer segments mostly (0.5) 1–5 cm long; *rays* of the umbel elongating unequally, generally some of them more or less elongate even at anthesis so that the umbelllets are not all contiguous, sometimes up to 11 cm long at maturity; *involucel* of well developed but mostly narrow and more or less linear-attenuate bractlets 2–7 (10) mm long and seldom over 1 mm wide; *flowers* yellow or occasionally white, the pedicels very short, only 1–2 (3) mm long at maturity; *fruit* glabrous, crowded and usually more or less numerous in each umbelllet, narrow and elongate, 6–13 mm long, 2–3 mm wide, very narrowly or scarcely winged, the wings up to about 0.5 mm wide, the oil-tubes solitary in the intervals, 2–4 on the commissure, often inconspicuous;  $2n = 22$ .

Open slopes, flats, meadows, and swales, especially in heavy clay soils, from the foothills to middle elev. (1900 m) in the mts., avoiding the dry plains; n., c., and w. Idaho (e. as far as Lincoln Co.), se. Wash., e. of the Cascade Mts. in Oregon, ne. Calif. (Lassen and Modoc cos.), and n. Nev. (Washoe and Elko cos.); disjunct in Carbon Co., Wyo., and w. Colo., and along the north rim of the Grand Canyon in Coconino Co., Ariz. May, June.

## 25. *Lomatium bicolor* (S. Watson) J. M. Coulter & Rose

*Peucedanum bicolor* S. Watson, Botany [Fortieth Parallel] 129. 1871. *Lomatium bicolor* (S. Watson) J. M. Coulter & Rose, Contr. U.S. Natl. Herb. 7: 237. 1900. *Cogswellia bicolor* (S. Watson) M. E. Jones, Contr. W. Bot. 12: 33. 1908. (*S. Watson* 467 in part, Parley's Park, Wasatch Mts., 6000 ft, Utah; lectotype by M. A. Schlessman, Syst. Bot. Monogr. 4: 26. 1984, at US!)

Little-heads lomatium.

Perennial, the root short and tuberous-thickened, with a mostly subterranean crown, the plants 1–4 dm tall, simple or branched at the base, glabrous or in part minutely scaberulous (especially the rays of the umbel), tending to develop a short underground pseudoscape, otherwise essentially acaulescent, or larger specimens often caulescent with 1 or 2 fairly well developed leaves near the base; *peduncles* elongate, mostly curved-ascending or the central one more erect; *leaves* ternate-pinnately dissected, with very numerous and slender ultimate segments, these mostly 2–7 mm long and about 0.5 mm wide or less; *rays* of the umbel elongating unequally, generally some of them more or less elongate even at anthesis, the individual umbelllets globose or hemispheric and appearing discrete (rather than all contiguous) at anthesis, the longer rays mostly 4–10 cm long at maturity, the pedicels very short, only 1–2.5 mm long at maturity; *involucel* of a few slender bractlets mostly 2–3 (5) mm long; *petals* yellow; *fruit* glabrous, crowded and usually more or less numerous in each umbelllet, narrow and elongate, 7–12 mm long, 2–5 mm wide, the wings narrow, less than 1 mm wide, the oil-tubes inconspicuous, not readily visible through the pericarp;  $2n = 22$ .

Moist to fairly dry slopes and meadows (sometimes even in fields) in the valleys and foothills, up to 2400 m; Wasatch Mts. in the vicinity

of Salt Lake City, Utah, n. to the Bear River Range in Franklin and Bear Lake cos., Idaho, and the Caribou Range in Bonneville Co., Idaho, and e. to the mts. of Lincoln and Uinta cos., Wyo.; reportedly disjunct to Gunnison Co., Colo. May–July.

This species was included in *L. leptocarpum* by Mathias and Constance (N. Amer. Fl. 28B(2): 233. 1945), but it differs in its more finely dissected leaves and distinctive range. Unlike *L. leptocarpum*, it does not appear to be partial to heavy clay soils. The name *L. bicolor* has priority at the specific level over *L. leptocarpum*.

## 26. *Lomatium ambiguum* (Nutt.) J. M. Coulter & Rose

*Eulophus ambiguus* Nutt., J. Acad. Nat. Sci. Philadelphia 7: 27. 1834. *Peucedanum ambiguum* (Nutt.) Nutt. ex Torr. & A. Gray, Fl. N. Amer. I: 626. 1840. *Lomatium ambiguum* (Nutt.) J. M. Coulter & Rose, Contr. U.S. Natl. Herb. 7: 212. 1900. *Cogswellia ambiguus* (Nutt.) M. E. Jones, Contr. W. Bot. 12: 33. 1908. (*N. J. Wyeth* s.n., "on the borders of Flat-Head river"; holotype at PH!)

Lacy lomatium.

Perennial, the taproot edible, short and tuberous-thickened to long and slender, sometimes moniliform, the plants glabrous and commonly somewhat glaucous, 1–8 dm tall, simple or more often branched; *leaves* basal and caudine or all caudine, ternate or ternate-pinnately 2 to several times dissected into narrow and usually very unequal ultimate segments, the longer segments mostly 1–8 cm long and up to 5 mm wide, the smallest ones often only 1–2 mm long, the lower leaves often with larger ultimate segments than the upper; *rays* of the umbel commonly somewhat elongate even at anthesis, the longer ones mostly 3–10 cm long at maturity, the pedicels 4–13 mm long at maturity; *involucel* none; *petals* yellow; *fruit* glabrous, narrowly oblong, 5.5–12 mm long and 1.5–3.5 mm wide, the wings evident but narrow, 0.3–0.5 (0.7) mm wide, the oil-tubes solitary in the intervals, 2 on the commissure, often inconspicuous;  $2n = 22$ .

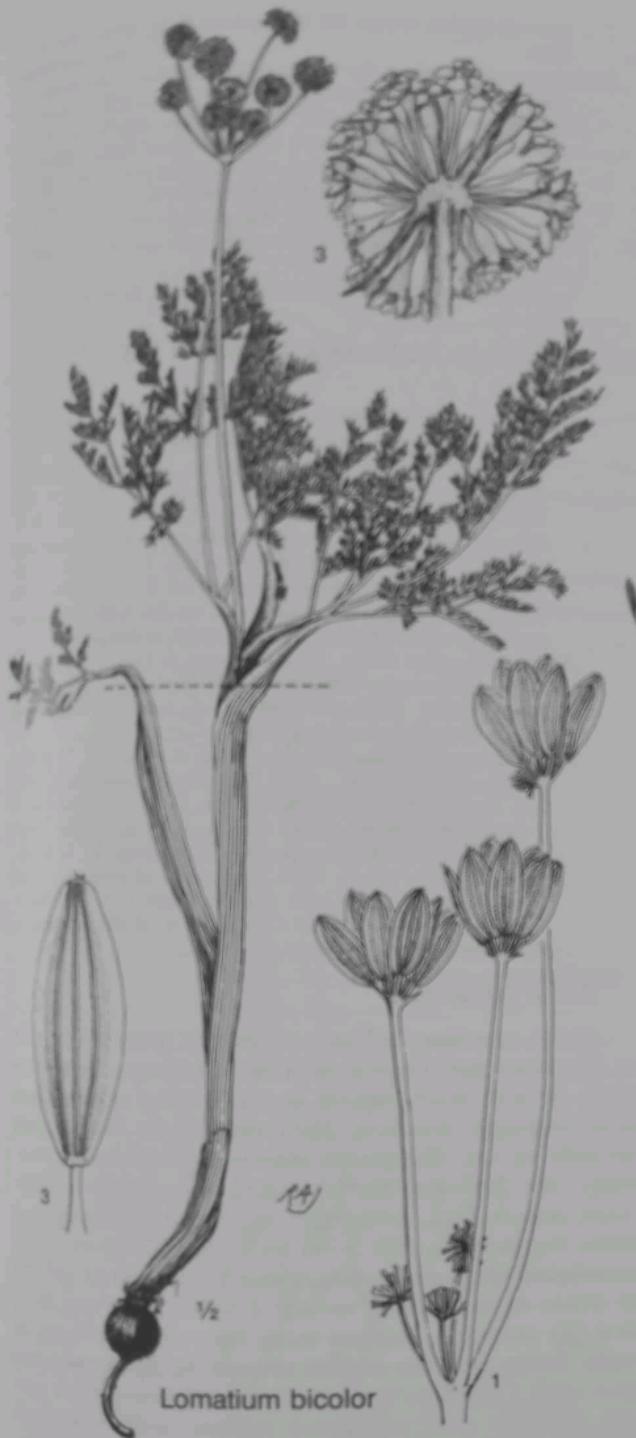
Open, often rocky slopes and flats, from the scablands, valleys, and foothills to middle elev. in the mts. (2700 m); Wash. and adjacent B.C. (mainly e. of the Cascade summits) and ne. Oregon, e. across Idaho (mainly n. of the Snake River Plain, but also in Cassia Co.) to w. Mont., and thence s. through nw. Wyo. to se. Idaho (Caribou Range, mts. near Pocatello) and the Wasatch Mts. of Utah. May, June.

## 27. *Lomatium triternatum* (Pursh) J. M. Coulter & Rose

*Seseli triternatum* Pursh, Fl. Amer. Sept. 197. 1814. *Eulophus triternatum* (Pursh) Nutt., J. Acad. Nat. Sci. Philadelphia 7: 27. 1834. *Peucedanum triternatum* (Pursh) Nutt. ex Torr. & A. Gray, Fl. N. Amer. I: 626. 1840. *Peucedanum nuttallii* Walp., Repert. Bot. Syst. 2: 411. 1843. *Lomatium triternatum* (Pursh) J. M. Coulter & Rose, Contr. U.S. Natl. Herb. 7: 227. 1900. *Cogswellia triternata* (Pursh) M. E. Jones, Contr. W. Bot. 12: 32. 1908. (*M. Lewis* s.n., on the waters of the Columbia River [probably actually on the Clearwater River near the mouth of Potlatch Creek, Idaho]; holotype at PH!)

*Peucedanum triternatum* var. *leptophyllum* Hook., Lond. J. Bot. 6: 235. 1847. *Cogswellia leptophylla* (Hook.) Rydb., Bull. Torrey Bot. Club 40: 74. 1913. *L. simplex* var. *leptophyllum* (Hook.) Mathias, Ann. Missouri Bot. Gard. 25: 283. 1937. (C. A. Geyer 505, slopes of the high plains of the Kootenay [Clearwater River]; holotype at K!) A form of subsp. *triternatum* with granular-scaberulous young fruits.

*Peucedanum triternatum* (as *citernatum*) var. ? *platycarpum* Torr. in Stansb., Explor. Great Salt Lake 389. 1852. *L. platycarpum* (Torr.) J. M. Coulter & Rose, Contr. U.S. Natl. Herb. 7: 226. 1900. *Cogswellia platycarpa* (Torr.) M. E. Jones, Contr. W. Bot. 12: 32. 1908. *L. triternatum* subsp. *platycarpum* (Torr.) Cronquist, Univ. Wash. Publ. Biol. 17(3): 565. 1961. *L. triternatum* var. *platycarpum* (Torr.) B. Boivin, Naturaliste Canad. 93: 643. 1966. (*H. Stansbury* s.n., Great Salt Lake, Utah, in 1850; holotype at NY!)



Lomatium bicolor

*Peucedanum simplex* Nutt. ex S. Watson, Botany [Fortieth Parallel] 129. 1871. *Cogswellia simplex* (Nutt. ex S. Watson) M. E. Jones, Bull. Montana State Univ., Biol. Ser. 15: 41. 1910. *L. simplex* (Nutt. ex S. Watson) J. F. Macbr., Contr. Gray Herb. 56: 34. 1918. (*T. Nuttall s.n.*, Rocky Mts.; isotype at NY!) = subsp. *platycarpum*.

*Peucedanum triternatum* var. *macrocarpum* J. M. Coulter & Rose, Rev. N. Amer. Umbell. 70. 1888. *Peucedanum triternatum robustius* J. M. Coulter & Rose ex Holz., Contr. U.S. Natl. Herb. 3: 228. 1895. *L. robustius* (J. M. Coulter & Rose ex Holz.) J. M. Coulter & Rose, Contr. U.S. Natl. Herb. 7: 228. 1900. *Cogswellia triternata* var. *robustior* (J. M. Coulter & Rose ex Holz.) M. E. Jones, Contr. W. Bot. 12: 32. 1908. *Cogswellia robustior* (J. M. Coulter & Rose ex Holz.) J. M. Coulter & Rose, Contr. U.S. Natl. Herb. 12: 451. 1909. *L. triternatum* var. *macrocarpum* (J. M. Coulter & Rose) Mathias, Ann. Missouri Bot. Gard. 25: 286. 1937. (Mathias considers *W. N. Suksdorf* 502, w. Klickitat Co., Wash., at US! to be the holotype.) An extreme form of var. *triternatum* with long, narrow fruits.



Lomatium ambiguum

*L. anomalam* M. E. Jones ex J. M. Coulter & Rose, Contr. U.S. Natl. Herb. 7: 237. 1900. *Cognwellia anomala* (M. E. Jones ex J. M. Coulter & Rose) M. E. Jones, Contr. W. Bot. 12: 32. 1908. *L. triternatum* var. *anomalum* (M. E. Jones ex J. M. Coulter & Rose) Mathias, Ann. Missouri Bot. Gard. 25: 285. 1937. (M. E. Jones 24, Indian Valley, Washington [now Adams] Co., Idaho, 15 July 1899; an original specimen at US!)

#### Ternate lomatium.

Perennial, the taproot edible, elongate and seldom much thickened, surmounted by a simple or occasionally few-branched crown or short caudex; stems or scapes solitary or few, more or less erect, mostly (1) 2–8 dm tall at maturity (or to 12 dm in var. *anomalum*), finely and often densely spreading-hirtellous, varying to rarely glabrous; leaves chiefly or wholly basal or low-cauline, 1 or more fairly well developed leaves often present on the middle or even the upper

part of the stem, but the stem not appearing very leafy, the leaves ternately to ternate-pinnately (or at the base quinately) 2–3 times (seldom only once) cleft into long, usually narrow segments or leaflets 1–10 (20) cm long (broader and up to 1 or even 2 cm wide in var. *anomalum*), mostly glabrous on the upper surface, finely spreading-hirtellous to glabrous on the lower surface; inflorescence at first generally compact and with contiguous umbellets, but soon becoming looser, the rays elongating unequally, the longer ones mostly 2–10 cm long at maturity, the pedicels (1) 2–6 (10) mm long at maturity; involucel of a few long, slender bractlets; petals yellow; fruit oblong to broadly elliptic, 7–15 (20) mm long, narrowly to very broadly winged, glabrous to occasionally minutely puberulent or granular-scabrous, the oil-tubes solitary in the intervals, 2 on the commissure;  $2n = 22$ .

Open slopes and meadows, in dry to fairly moist soil, from the lowlands to middle elev. in the mts. (up to 2700 m); B.C. and s. Alta. to n. Calif., n. Nev. (Washoe and Elko cos.), s. Utah, n. Ariz., and Colo. May–July.

*Lomatium triternatum* as here defined consists of two major morphologic-geographic races that have often been treated as distinct species, under the names *L. triternatum* (*sensu stricto*) and *L. simplex*. The two are sufficiently well marked in their typical forms, but so thoroughly intergradient in a broad contact zone that no clear line can be drawn between them. Occasional plants from well within the geographic range of one approach or simulate the other in one or more respects. These two major races are here treated as subsp. *triternatum* and subsp. *platycarpum*.

Subspecies *triternatum* has two well marked but wholly intergradient varieties, var. *triternatum* and var. *anomalum*. Variety *anomalum* diverges from var. *triternatum* in the direction of *L. nudicaule*, but apparently does not intergrade with the latter. Most of the range of var. *anomalum* is included within that of var. *triternatum*, but var. *anomalum* also occurs in a limited area in southeastern Idaho and northern Utah and adjacent Wyoming, where it seems wholly distinct from the more common subsp. *platycarpum*.

A case could be made for treating the three ultimate infraspecific taxa here as co-equal varieties. The names var. *anomalum* (M. E. Jones ex J. M. Coulter & Rose) Mathias and var. *platycarpum* (Torr.) B. Boivin are available for use by those who prefer this option.

The differences among these taxa are summarized in the following key:

- 1 Fruit broadly elliptic, the wings nearly or fully as wide as (or wider than) the body; leaves fairly regularly dissected, tending to be more nearly ternate than pinnate, the ultimate segments always linear or nearly so, relatively few, less crowded and less markedly unequal than in subsp. *triternatum*; plants more often scapose or nearly so than distinctly caulescent; lower surface of the leaves usually short-hairy, only seldom glabrous; more southern or eastern than subsp. *triternatum*, occurring from c. and sw. Colo., n. Ariz., Utah, and n. Nev., n. to Wyo., w. Mont. (chiefly e. of the continental divide), the drier parts of c. Idaho (but more common from the Snake River Plain southward), e. Oregon (where mostly at lower elev. than subsp. *triternatum*), the drier parts of c. Wash., and the Okanogan Valley of s. B.C. .... subsp. *platycarpum* (Torr.) Cronquist
- 1 Fruit usually relatively narrow, the wings seldom more than half as wide as the body; leaves tending to be less regularly and more nearly pinnately dissected than in subsp. *platycarpum*, although the first division is usually ternate or even quinate, the ultimate segments tending to be more numerous, more markedly unequal, and more crowded than in subsp. *platycarpum*; plants distinctly caulescent, or less often scapose; lower surface of the leaves short-hairy or often glabrous; s. Alta. and B.C. to nw. Mont., c. Idaho (almost entirely n. of the Snake River Plain), s. Oregon (but scarcely in our range), and n. Calif.; isolated in se. Idaho, n. Utah, and sw. Wyo. (Lincoln Co.) .... subsp. *triternatum*
- 2 Ultimate segments of the leaves, as in subsp. *platycarpum*, mostly linear or nearly so and more or less strongly acute, rarely any of them more than about 8 mm wide, the lower surface either glabrous or short-hairy; nearly the range of

the subspecies, except for the enclave in se. Idaho and n. Utah ..... var. *triternatum*

2 Ultimate segments of the leaves mostly broader than linear, obtuse or rounded to barely acute, often some of them more than 8 mm (to 2 cm) wide, the lower surface fairly consistently glabrous; Nez Perce to Washington, Ada, Camas, and nw. Lincoln cos., Idaho, and extending into adjacent ne. Oregon, adjoining but barely entering our range; disjunct in se. Idaho (Bear River Range), Lincoln Co., Wyo., and the mts. of n. Utah (Weber, Morgan, and w. Summit cos.) ..... var. *anomalum* (M. E. Jones ex J. M. Coulter & Rose) Mathias

## 28. *Lomatium nudicaule* (Pursh) J. M. Coulter & Rose

*Smyrnium nudicaule* Pursh, Fl. Amer. Sept. 196. 1814. *Ferula nudicaule* (Pursh) Nutt., Gen. N. Amer. Pl. I: 183. 1818. *Pastinaca nudicaulis* (Pursh) Spreng. in Roem. & Schult., Syst. Veg. 6: 587. 1820. *Ferula nuttallii* DC., Prodri. 4: 174. 1830. *Peucedanum nudicaule* (Pursh) Nutt. ex Torr. & A. Gray, Fl. N. Amer. I: 627. 1840. *Lomatium nudicaule* (Pursh) J. M. Coulter & Rose, Contr. U.S. Natl. Herb. 7: 238. 1900. *Cogswellia nudicaulis* (Pursh) M. E. Jones, Contr. W. Bot. 12: 31. 1908. (*M. Lewis* s.n., on the Columbia River [probably at The Dalles], 15 Apr 1806; holotype at PH!) *Seseli leiocarpum* Hook., Fl. Bot.-Amer. I: 263. 1832. *Peucedanum leiocarpum* (Hook.) Nutt. ex Torr. & A. Gray, Fl. N. Amer. I: 626. 1840. (*D. Douglas* s.n., near Fort Vancouver on the Columbia; holotype at K!) *Peucedanum latifolium* Nutt. ex Torr. & A. Gray, Fl. N. Amer. I: 625. 1840; not DC., 1830. *Peucedanum nuttallii* S. Watson, Botany [Fortieth Parallel] 128. 1871. *L. platyphyllum* J. M. Coulter & Rose, Contr. U.S. Natl. Herb. 7: 238. 1900. *Cogswellia latifolia* (Nutt. ex Torr. & A. Gray) M. E. Jones, Contr. W. Bot. 12: 31. 1908. *Cogswellia platyphylla* (J. M. Coulter & Rose) J. M. Coulter & Rose, Contr. U.S. Natl. Herb. 12: 450. 1909. (*T. Nuttall* s.n., plains e. of the Wallawalla River; an original specimen at NY!)

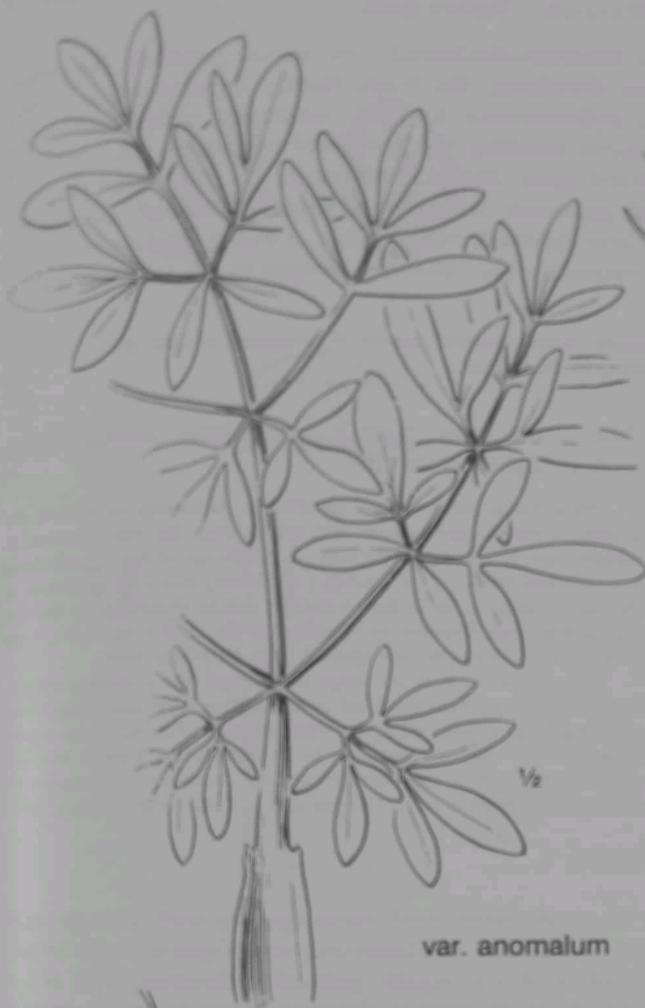
### Pestle lomatium.

Stems or scapes solitary or several from the simple or few-branched crown of a stout taproot, generally more or less erect, naked or leafy only at the base, often strongly fistulose just beneath the umbel, especially in age, the plants mostly 2–9 dm tall at maturity, the herbage glabrous and strongly blue-glaucous; leaves firm, ternately or pinnately 1–3 times compound, with 3–30 well defined, veiny, often petiolulate ultimate leaflets, these lanceolate or oblong to ovate or subrotund, mostly 2–9 cm long and (0.4) 1–4 (6) cm wide, seldom more than twice as long as wide, entire or often dentate toward the tip, sometimes also with 1 or more irregular lobes representing a partial division into additional leaflets; umbellets well separated from each other at anthesis and usually rather numerously flowered, the rays of the umbel elongating unequally, the longer ones mostly 6–20 cm long at maturity, the fruiting pedicels 3–15 mm long; involucel wanting; petals yellow; fruit 7–15 mm long, oblong or elliptic, sometimes narrowed to a short beak-like tip, the wings up to about half as wide as the body, the oil-tubes solitary in the dorsal intervals, 1 to several in the lateral ones, several on the commissure;  $2n = 22$ .

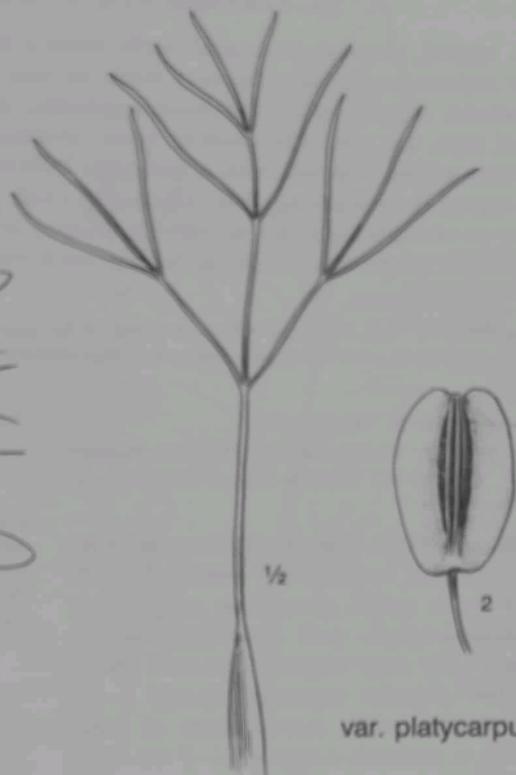
Dry, open or sparsely wooded places, often with sagebrush or ponderosa pine, from the lowlands to middle elev. (2400 m) in the mts.; s. B.C. to sw. Alta., s. to e. Calif., Nev. (as far s. as Nye and Lincoln cos.), and n. and w. Utah (Box Elder, Juab, Tooele, and Weber cos.), and e. in and about the Snake River Plain of Idaho as far as Butte and Cassia cos. Apr–June.

Our most distinctive species of the genus, M. Lewis and W. Clark noted that "the natives eat the tops and boil it sometimes with their soup."

## LOMATIUM

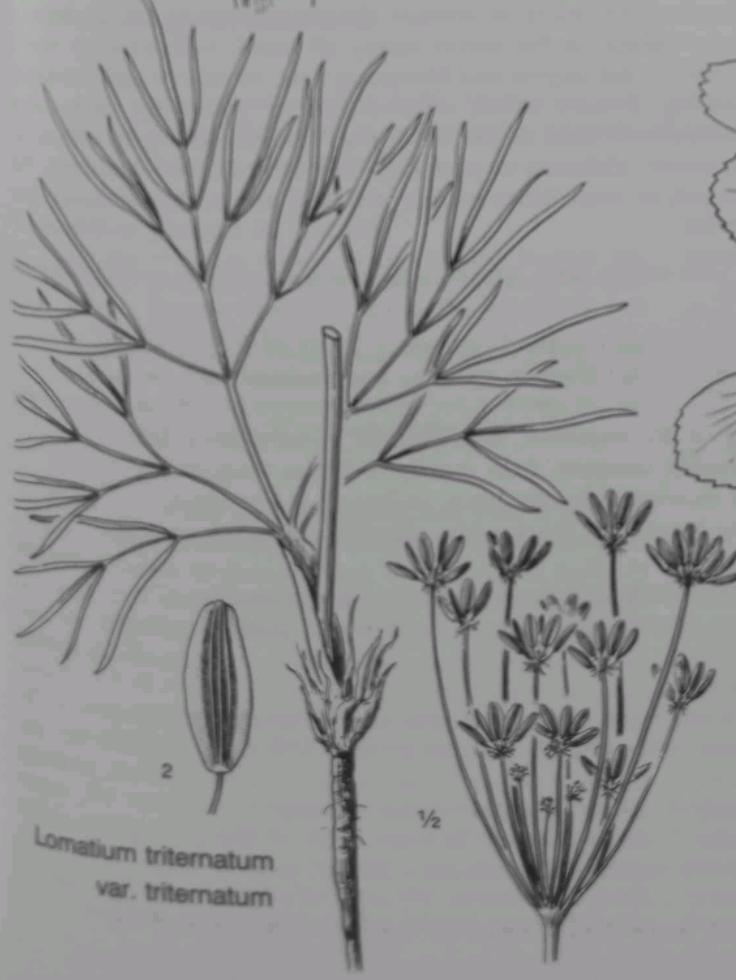
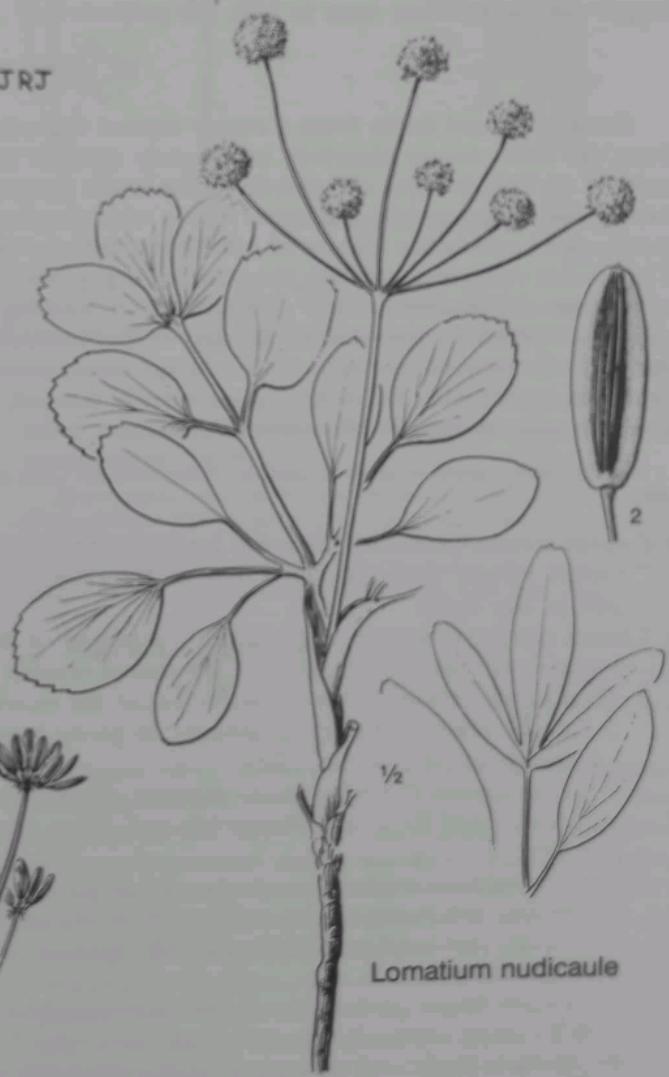


var. anomale



var. platycarpum

J.R.J.

Lomatium triternatum  
var. triternatum

Lomatium nudicaule