

Flora of Yukon

**A provisional update of vascular plant taxonomic keys
(supplementary material file)**

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The following keys may be download and used by individuals at no cost. The author should be contacted for written permission for other circumstances (wstrong@northwestel.net).

INTRODUCTION

The following represents provisionally revised and updated taxonomic keys for Yukon vascular plants. The text is formatted for double-sided printing on 14 cm × 21.6 cm (5.5" × 8.5") paper or in the upper-middle portion of 21.6 cm × 27.9 cm (8.5" × 11") paper. When trimming the excess paper from the larger paper size, retain at least a 1 cm left-margin to accommodate a loose binding. Use of a loose binding will allow pages to lay flat when the document is open. The addition of firm covers will prolong the life of the printed material when used in fieldwork. Alternatively, the digital file can be downloaded to an electronic device.

Use of the keys begins with the KEY TO TRACHEOPHYTA (p. 3), which allows the identification of an appropriate taxonomic class (pp. 3–8). From a class key, families can be identified (pp. 3–9). In the KEY TO GENERA AND SPECIES BY FAMILIES, families are presented alphabetically with exceptions. When a taxonomic class, family, or genera included only one species normally without additional infraspecific subdivisions, it was included within the broader category rather than presented it as a separate entity to avoid duplication of entries (e.g., see Scheuchzeriaceae, p. 3 and Amaranthaceae, p. 9). In some cases, the mixed presence of genera or species within a key represents their position of occurrence in Cody (2000) prior to a name change.

The sources of an identification criterion are indicated with footnotes to avoid cluttering the keys with numerous author names and publication dates. See the References for specific literature citations. If not denoted with a footnote, a criterion was derived from Cody (2000)¹⁷ or independently created. Nomenclature and taxonomic family membership were primarily based on the VASCAN database (<https://canadensys.net/vascan>). Please consult the source of these keys for a description of methods (see Citation below). Comments regarding problems or suggested improvements to individual keys may be sent to wlstrong@northwestel.net.

Appendices I and II identify which taxonomic families and genera that occur among the keys and their location by page number, respectively. Appendix III provides a list of updated taxon names relative to those included in Cody (2000), which are flagged with an asterisk (*) at the end of the taxon name. Appendix IV defines specialized terms and symbols that were not included in Cody (2000).

ACKNOWLEDGEMENTS

Canadian Science Publishing (copyright holder) granted permission to use Cody (2000)¹⁷ as the basis for the current revision (Judy Busnarda, Senior Editorial Director, 22 March 2024, pers. comm.). The Flora of North America Editorial Committee under its CC-BY license policy allowed the use of text materials from its various volumes and updates, and the University State Utah (copyright holder, as per Dr. Mary Barkworth, 6 February 2024, pers. comm.) permitted use of materials from its Poaceae volumes of the Flora of North America. Without the generosity of these organizations, this revision would have been much more difficult to accomplish. The list of known Yukon plants was provided by Randi Mulder (Yukon Conservation Data Centre) and Dr. Donald Reid (Wildlife Conservation Society Canada, Whitehorse), who tested an early version of the keys. Review comments by Dr. Ashley Egan (Associate Editor) and two anonymous reviewers improved the keys. Yukon Energy, Mines and Resources Library acquired copies of literature that were locally unavailable.

SOURCE CITATION

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KEY TO TRACHEOPHYTA

- A. Plants reproducing by spores, with neither flowers (flws) nor seeds (Pteridophyta) ⁴⁴
 - B. Leaves/fronds (lvs) broad, usually >20 mm long, variously incised or dissected Class **POLYPODIOPSIDA**
 - B. Lvs slender, scale-like, simple, sessile, mostly smaller; spore cases in terminal cone-like spike or in axils of lvs
 - C. Stem conspicuously jointed and hollow; lvs scale-like in sheath-like whorls at nodes Subclass **EQUISETIDAE (EQUISETACEAE)**
 - C. Stem not conspicuously jointed and hollow; lvs mostly imbricate Class **LYCOPODIOPSIDA**
- A. Plants lacking spores; reproduction based on flws and seeds (Spermatophyta)
 - D. Ovules not enclosed in an ovary; seeds in a dry cone, sometimes a berry-like fruit; pollen sacs on scales arranged in cones; lvs needle- or scale-like; mostly evergreen (formerly Gymnospermae) Class **CONIFERAE**
 - D. Ovules enclosed in an ovary and at maturity becomes the fruit; pollen sacs terminating stamens, usually associated with flw petals or scales (Angiospermae)
 - E. Lvs usually parallel-veined; vascular bundles of stem irregularly arranged; cambium absent; flw parts usually in 3s or 6s; embryo with 1 cotyledon; usually herbs (formerly Monocotyledoneae) Class **LILIOPSIDA**
 - E. Lvs usually net-veined; vascular bundles of stem in a single ring; cambium usually present; flw parts usually in 5s or 4s; embryo with 2 cotyledons; herbs, shrubs, or trees (formerly Dicotyledoneae) Class **MAGNOLIOPSIDA**

KEYS TO FAMILIES BY TAXONOMIC CLASS ¹⁷, except where indicated by other footnotes

CONIFERAE

- A. Shrub; lvs scale-like or awl-shaped; fruit berry-like at maturity **CUPRESSACEAE**
- A. Tree; lvs needle-shaped; fruit woody cones at maturity **PINACEAE**

LILIOPSIDA

- A. Plants not differentiated into stem and lvs, small, thallus-like; free-floating or an immersed aquatic plant **ARACEAE**
- A. Plant with stem and lvs, not thallus-like; terrestrial plant
 - B. Perianth lacking, inconspicuous bristles or scales, or petals inconspicuous; plant often rush- or grass-like
 - C. Ovary and locules >1 ³⁴, carpels sometimes partially fused laterally; colored petals may be present but inconspicuous, otherwise represented by scales
 - D. Perianth dry, often scarious; flws often in panicles or heads; carpels 3, united, forming a small capsule **JUNCACEAE**
 - D. Perianth herbaceous; flws in racemes or spikes; carpels 3 or 6, almost distinct, separating as follicles when ripe
 - E. Stem scapose from tuft of basal lvs; flws small in a narrow spike-like raceme **JUNCAGINACEAE**
 - E. Stem leafy; flws in short few-flwd raceme **SCHEUCHZERIACEAE (Scheuchzeria palustris) [B]**
 - C. Ovary with single ovule and locule ²⁸, carpels not fused
 - F. Flws enclosed or subtended by scales (glumes); plant grass-like, with jointed stems, sheathing lvs and 1-seeded fruit
 - G. Stems usually hollow, terete, or flattened; lvs 2-ranked with sheaths usually split; anthers attached at middle **POACEAE**
 - G. Stem solid, usually 3-sided; lvs usually 3-ranked, sheaths not split; anthers attached at base **CYPERACEAE**
 - F. Flws not enclosed in scale; plant not grass-like
 - H. Aquatic stemless plant or with flaccid stem and lvs, either immersed or floating
 - I. Plant fronts (or lvs) small (5–10 mm long) and forming submerged mats, or tiny (5 mm diameter) floating on water surface, ... **ARACEAE**
 - I. Plant stem >15–250 mm long, not mat forming, rooted
 - J. Flws unisexual, solitary in leaf axils, staminate a single stamen surrounded sac-like perianth ⁴⁷ **HYDROCHARITACEAE (Najas flexilis) [B]+**
 - J. Flws bisexual, terminal spikes or axillary clusters **POTAMOGETONACEAE**

- H. Terrestrial plant or base in water, with stem sufficiently rigid to support flwing shoot above water level
 - K. Pistillate flws a firm, thick cylindrical or spherical head, monoecious **TYPHACEAE**
 - K. Pistillate flws a fleshy spike subtended by a large bract (spathe), perfect **ARACEAE**
- B. Perianth conspicuous, at least inner whorl brightly colored
 - L. Carpels numerous, in ring or cluster, becoming achenes **ALISMATACEAE**
 - L. Carpels 3, with ovaries united; fruit a capsule or berry
 - M. Ovary inferior
 - N. Flws regular; stamens 3 **IRIDACEAE**
 - N. Flws very irregular; stamens 1 or 2 **ORCHIDACEAE**
 - M. Ovary superior (rarely part inferior)
 - O. Flws in terminal umbel; plant onion smelling **AMARYLLIDACEAE** (*Allium schoenoprasum*) [B]
 - O. Flws borne singly or in raceme; plant onion smelling
 - P. Flws borne singly or in pairs on lower side of stem below lvs **LILIACEAE**
 - P. Flws borne in terminal clusters
 - Q. Plant with basal bulb **MELANTHIACEAE**
 - Q. Plant rhizomatous
 - R. Lvs very large and distinctly pleated, rhizome coarse **MELANTHIACEAE**
 - R. Lvs neither very large nor pleated; rhizome not coarse
 - S. Lvs linear, >4 times longer than broad, 2-ranked **TOFIELDIACEAE**
 - S. Lvs 1–4 times longer than broad, usually >20 mm wide, alternate **ASPARAGACEAE**

LYCOPODIOPSIDA

- A. Plant aquatic or amphibious; lvs slender, grass-like, 50–150 mm long, dilated and sheathed at base; plant resembling grass; base corm-like; sporangia in hollow base of lvs **ISOETACEAE**
- A. Plant terrestrial; lvs small, <15 mm long, not sheathed at base; plants resembling moss; base lacking corm-like structure; sporangia occurring in leaf axils or as terminal cone that are club-like spikes
 - B. Sporangia in axils of lvs, plant typically <40 mm tall, delicate. **SELAGINELLACEAE**
 - B. Sporangia terminal strobili, if axillary, then plant coarser and taller **LYCOPODIACEAE**

MAGNOLIOPSIDA

- A. Corolla none; calyx present or lacking
 - B. Plants monoecious or dioecious; staminate and pistillate flws, with one or both kinds in catkins or dense heads **GROUP 1**
 - B. Plants mostly with perfect flws not forming catkins **GROUP 2**
- A. Corolla and calyx both present
 - C. Corolla of separate petals
 - D. Stamens usually >10, and twice number of sepals or calyx lobes **GROUP 3**
 - D. Stamens not more than twice as many as petals **GROUP 4**
 - C. Corolla with petals more or less united
 - E. Stamens more numerous than corolla lobes **GROUP 5**
 - E. Stamens not more numerous than corolla lobes **GROUP 6**

GROUP 1

- A. Herb; staminate or pistillate flws in catkins or catkin-like heads **URTICACEAE**
- A. Tree or shrub; staminate and pistillate flws both in catkins or catkin-like heads
 - B. Ovary becoming a many-seeded capsule; seeds with hairy-tuft **SALICACEAE**
 - B. Ovary becoming a 1-seeded nut or winged nutlet, not with hairy-tuft
 - C. Pistillate flws 2 or 3 at each bract of catkin; fruit not resin-dotted. **BETULACEAE**
 - C. Pistillate flws single at each bract; fruit resin-dotted **MYRICACEAE** (*Myrica gale*) [B]

GROUP 2

- A. Ovary or its locules with many ovules
 - B. Ovary and fruit partly inferior **SAXIFRAGACEAE**
 - B. Ovary or ovaries superior
 - C. Ovaries 2 or more, separate **RANUNCULACEAE**
 - C. Ovary single
 - D. Lvs compound **RANUNCULACEAE**

- D. Lvs simple
 - E. Sepals separate CARYOPHYLLACEAE
 - E. Sepals more or less united PRIMULACEAE
- A. Ovary or its locules with only 1 or 2 ovules
 - F. Pistil >1 carpel; carpels separate or nearly so
 - G. Flws apetalous; fruit a samara ³⁴ SAPINDACEAE (*Acer negundo*) [X]+
 - G. Flws petalous; fruit achenes, a follicle, or a berry RANUNCULACEAE
 - F. Pistil solitary, simple or compound
 - H. Ovary inferior or partly so, or so closely enclosed by calyx to appear inferior
 - I. Aquatic herbs; lvs whorled HALORAGACEAE
 - I. Terrestrial plants; lvs opposite or alternate
 - J. Shrubs or small trees; lvs scurfy; calyx not corolla-like ELAEAGNACEAE
 - J. Herbs; lvs not scurfy; calyx corolla-like SANTALACEAE
 - H. Ovary superior; flws hypogynous
 - K. Stipules (ocreae) sheathing stem at leaf nodes POLYGONACEAE
 - K. Stipules, if present, not sheathing stem at leaf nodes
 - L. Plants usually aquatic, immersed or nearly so
 - M. Lvs opposite, entire; styles 2 PLANTAGINACEAE
 - M. Lvs whorled, finely-dissected; style 1 CERATOPHYLLACEAE (*Ceratophyllum demersum*) [B]
 - L. Plants terrestrial, sometimes growing in marshy places
 - N. Styles, if any, with 1 stigma
 - O. Flws unisexual; ovary of fertile flws 1-loculed URTICACEAE
 - O. Flws perfect; ovary 2-loculed and 2-seeded BRASSICACEAE
 - N. Styles with 2–3 stigma
 - P. Plants with milky juice EUPHORBACEAE (*Euphorbia virgata*) [X]+
 - P. Plants without milky juice AMARANTHACEAE

GROUP 3

- A. Ovary inferior; flws epigynous
 - B. Plant aquatic, herbarous; lvs floating; blades peltate NYMPHAEACEAE
 - B. Plant terrestrial shrubs; blades not floating nor peltate ROSACEAE
- A. Ovary superior; flws hypogynous or perigynous
 - C. Carpels few to numerous, entirely separate or united only at base
 - D. Stamen filaments united; ovaries cohering in ring around a central column ³⁴ MALVACEAE (*Malva pusilla*) [X]+
 - D. Stamen filaments not united; ovaries not cohering in a ring around a central column
 - E. Stamens inserted below ovaries; lvs without stipules RANUNCULACEAE
 - E. Stamens inserted on a hypanthium or on a disc; lvs often stipulate ROSACEAE
 - C. Carpels solitary, or few to several with ovaries completely united
 - F. Ovary simple, 1-loculed
 - G. Ovules 2; seed solitary; fruit a drupe ROSACEAE
 - G. Ovules numerous; fruit not a drupe RANUNCULACEAE
 - F. Ovary compound, with one to several locules, placentae, styles, or stigmas
 - H. Ovary 1-loculed PAPAVERACEAE
 - H. Ovary several-loculed NYMPHAEACEAE

GROUP 4

- A. Stamens of same number as petals and opposite them
 - B. Style and stigma 1; sepals usually 5 PRIMULACEAE
 - B. Styles and stigmas 2, 3, or more; sepals 2 MONTIACEAE
- A. Stamens not same number as petals, or if same number alternate with petals
 - C. Ovary superior; flws hypogynous or perigynous
 - D. Ovaries 2 or more, wholly separate or somewhat united
 - E. Stamens inserted on receptacle at base of ovary
 - F. Carpels more or less united, with a common style; carpel splits from bottom to top GERANIACEAE
 - F. Carpels separate or united only at base; carpel typically splits from top to bottom
 - G. Lvs fleshy, entire CRASSULACEAE
 - G. Lvs not fleshy, usually lobed or compound RANUNCULACEAE

- E. Stamens inserted on the perianth or on a hypanthium
 - H. Plants fleshy; stamens just twice as many as carpels **CRASSULACEAE**
 - H. Plants not fleshy; stamens more than twice as many as the carpels
 - I. Leaf stipules absent; flws white with sterile filaments **CELASTRACEAE**
 - I. Leaf stipules present; flws seldom white, lacking sterile filaments **ROSACEAE**
- D. Ovary 1 (simple or compound)
 - J. Ovary simple with 1 parietal placenta or 1 style **FABACEAE**
 - J. Ovary compound, with 1 to several locules, placentae, styles, or stigmas
 - K. Ovary 1-loculed
 - L. Corolla quite irregular
 - M. Petals 4; stamens 6 **PAPAVERACEAE**
 - M. Petals 5; stamens 5 **VIOLACEAE**
 - L. Corolla regular or nearly so
 - N. Fruit 1-seeded
 - O. Petals 4; herb, lvs not trifoliate **BRASSICACEAE**
 - O. Petals 5; shrub, lvs trifoliate ³⁴ ... **ANACARDIACEAE** (*Toxicodendron radicans* var. *rydbergii*) [M]*
 - N. Fruit with >1 seed
 - P. Placentation central **CARYOPHYLLACEAE**
 - P. Placentation parietal
 - Q. Lvs with gland-tipped hairs; small insectivorous plant **DROSERACEAE**
 - Q. Lvs without gland-tipped tentacles; not insectivorous plant
 - R. Flw petals usually 5 or lacking, sepals 5(4); stamens 4–10; carpels partially united or separate; petals white, pink or purplish, occasionally yellow; fruit 2-beaked **SAXIFRAGACEAE**
 - R. Flw petals 4; sepals 4; stamens 6; carpels united; petals typically yellow, yellowish, or white; fruit 1-beaked **BRASSICACEAE**
 - K. Ovary 2- to several-loculed
 - S. Flws irregular (zygomorphic) **BALSAMINACEAE** (*Impatiens noli-tangere*) [B]
 - S. Flws regular or nearly so
 - T. Flws with 6 stamens, 4 petals, and an ovary with 2-locules **BRASSICACEAE**
 - T. Flws with a different combination of characteristics
 - U. Ovules several; seeds usually several to many in each locule
 - V. Styles 2–5; lvs opposite **CARYOPHYLLACEAE**
 - V. Style 1; lvs alternate or whorled **ERICACEAE**
 - U. Ovules and seeds 1 or 2 in each locule
 - W. Depressed evergreen shrub with small flws, berry-like fruit **ERICACEAE**
 - W. Herbs with showy flws; fruit a capsule
 - X. Capsule short-beaked, globular, splitting from top into 5 parts, each 2-seeded **LINACEAE** (*Linum lewisii* var. *lewisii*) [M]
 - X. Capsule long-beaked, elongate, splitting from below upward into 5 parts, each 1-seeded **GERANIACEAE**
 - C. Ovary inferior; flws epigynous
 - Y. Ovules and seeds 1 in each locule
 - Z. Stamens 5 or 10
 - a. Fruit berry-like; styles 5 **ARALIACEAE**
 - a. Fruit dry, splitting at maturity; styles 2 **APIACEAE**
 - Z. Stamens 4 or 8
 - b. Fruit a drupe and infl subtended by whorl of 4 white bracts **CORNACEAE**
 - b. Fruit a capsule or nut-like and infl not subtended by whorl of 4 white bracts
 - c. Plant terrestrial, usually dry sites **ONAGRACEAE**
 - c. Plant aquatic, emergent or submerged
 - d. Lvs entire; flws in axils of lvs **PLANTAGINACEAE**
 - d. Lvs pectinately divided; flws in terminal spike **HALORAGACEAE**
 - Y. Ovules and seeds >1 per locule
 - e. Ovary 1-loculed; fruit a berry **GROSSULARIACEAE**
 - e. Ovary ≥2 loculed; fruit not a berry
 - f. Style 1; stamens 4 or 8 **ONAGRACEAE**
 - f. Styles 2–3; stamens 5 or 10 **SAXIFRAGACEAE**

GROUP 5

- A. Ovary 1-loculed; corolla irregular; herbaceous
 - B. Placentae 2; sepals 2, small; petals 4, with 1 spurred at base **PAPAVERACEAE**
 - B. Placenta 1; sepals usually 5 or wholly united; petals 5, with 2 usually united along 1 edge **FABACEAE**
- A. Ovary 3- to several loculed; corolla regular or irregular; mostly woody but sometimes a herbaceous
 - C. Corolla irregular, with large pouch terminating in a spur; anthers united **BALSAMINACEAE**
 - C. Corolla regular, without large pouch; anthers separate
 - D. Shrubs; lvs simple **ERICACEAE**
 - D. Small herbs; basal lvs ternate **VIBURNACEAE**

GROUP 6

- A. Stamens opposite corolla lobes and of same number
 - B. Styles 5; fruit 1-seeded; lvs linear **PLUMBAGINACEAE** (*Armeria maritima* ssp. *sibirica*) [B]*
 - B. Style 1; fruit several-seeded; lvs wider **PRIMULACEAE**
- A. Stamens alternate with corolla lobes and of same number or fewer
 - C. Ovary inferior; flws epigynous
 - D. Stamens free from corolla **CAMPANULACEAE**
 - D. Stamens inserted on corolla
 - E. Ovary with 1 fertile locule; calyx often modified as a pappus
 - F. Flws in panicled cyme, not in heads **VALERIANACEAE**
 - F. Flws in involucrate heads **ASTERACEAE**
 - E. Ovary with 2 or more fertile locules and ≥ 2 ovules; calyx not modified as a pappus or other special structure
 - G. Herb; stems mostly 4-sided; lvs whorled **RUBIACEAE**
 - G. Shrub or creeping semi-shrub; stems rounded; lvs opposite
 - H. Lvs compound **VIBURNACEAE**
 - H. Lvs simple
 - I. Low trailing dwarf shrub, short petioled, <5 mm; fruit dry **LINNAEACEAE**
 - I. Erect shrub; lvs long petioled, >5 mm; fruit a berry or berry-like
 - J. Leaf margin coarsely toothed, broadly palmately veined **VIBURNACEAE**
 - J. Leaf margin entire or wavy, not palmately veined **CAPRIFOLIACEAE**
 - C. Ovary superior; flws perigynous
 - K. Corolla distinctly irregular (zygomorphic)
 - L. Ovules solitary in locules; ovary separating at maturity into 4 nutlets **LAMIACEAE**
 - L. Ovules ≥ 2 in each locule; ovary not separating into nutlets
 - M. Plants without green lvs and parasitic on roots of other plants **OROBANCHACEAE**
 - M. Plants with green lvs, autotrophic
 - N. Ovary 1-loculed; stamen 2; small carnivorous plants; flws apically and solitary **LENTIBULARIACEAE**
 - N. Ovary 2-loculed; stamens 4, or in some cases 5 or 2; not carnivorous; flw not both apical and solitary
 - O. Plant annual
 - P. Stamens 2 **PLANTAGINACEAE**
 - P. Stamens 4
 - Q. Plant semi-aquatic (muddy or sandy pond margins) with linear basal lvs; flws solitary in leaf axils **SCROPHULARIACEAE**
 - Q. Plant terrestrial with nonlinear basal lvs; flws not both solitary and in leaf axils
 - R. Corolla 3–4 mm long, flws tiny **OROBANCHACEAE**
 - R. Corolla longer than 3–4 mm; flws conspicuous
 - S. Calyx flattened, conspicuously inflated in fruit **OROBANCHACEAE**
 - S. Calyx not flattened
 - T. Flws long-pedicellated **PLANTAGINACEAE**
 - T. Flws sessile **OROBANCHACEAE**
 - O. Biennial or perennial
 - U. Stamens 2 **PLANTAGINACEAE**
 - U. Stamens 4
 - V. Corolla spurred, bright yellow with orange throat, white below in terminal raceme **PLANTAGINACEAE**
 - V. Corolla not spurred, not bright yellow with orange

- throat in terminal raceme
- W. Upper lip forming a hood **OROBANCHACEAE**
- W. Upper lip not forming a hood
 - X. Corolla yellow **PHRYMACEAE** (*Erythranthe guttata*) [M]*
 - X. Corolla blue or white **PLANTAGINACEAE**
- K. Corolla regular
 - Y. Stamen numbers fewer than lobes of corolla
 - Z. Stem 4-sided; ovary deeply 4-lobed **LAMIACEAE**
 - Z. Stem not 4-sided; ovary 2-loculed, not 4-lobed
 - a. Lvs mostly basal; corolla scarious; capsule circumscissile **PLANTAGINACEAE**
 - a. Lvs mostly cauline and opposite; corolla not scarious; dehiscence not circumscissile **SCROPHULARIACEAE**
 - Y. Stamen numbers as many as corolla lobes
 - b. Carpels separate, except sometimes at apex;
 - lvs or stem with milky sap **APOCYNACEAE** (*Apocynum androsaemifolium*) [M]
 - b. Carpels united; lvs or stem without milky juice
 - c. Ovary deeply 4-lobed, at maturity separating into 2 or 4 nutlets
 - d. Lvs alternate; stems usually rounded; flws mostly regular **BORAGINACEAE**
 - d. Lvs opposite; stems usually 4-sided; flws mostly irregular **LAMIACEAE**
 - c. Ovary not deeply 4-lobed
 - e. Ovary 1-loculed
 - f. Lvs opposite, entire **GENTIANACEAE**
 - f. Lvs usually alternate, toothed, lobed, or compound
 - g. Lvs with 3 entire leaflets (lfts); corolla white-bearded on adaxial surface **MENYANTHACEAE** (*Menyanthes trifoliata*) [B]
 - g. Lvs, if compound, toothed lfts; corolla not white-bearded **HYDROPHYLLACEAE**
 - e. Ovary 2- to 10-loculed
 - ← ← (couplets shifted left)
 - h. Stamens free from corolla or nearly so **ERICACEAE**
 - h. Stamens inserted on corolla tube
 - i. Stamens 4
 - j. Lvs mostly basal, strongly veined; corolla scarious **PLANTAGINACEAE**
 - j. Lvs mostly cauline, not strongly veined; corolla not scarious
 - k. Stem 4-sided; fruit of 2 or 4 nutlets **LAMIACEAE**
 - k. Stem not 4-sided; fruit a capsule, many seeded **PLANTAGINACEAE**
 - i. Stamens usually 5
 - l. Fruit of 2 or 4 nutlets; ovary somewhat 4-lobed **BORAGINACEAE**
 - l. Fruit a capsule; ovary not 4-lobed
 - m. Styles 2, style 1 and 2-cleft; ovary 2-loculed; infl spike-like **HYDROPHYLLACEAE**
 - m. Styles 1, 3-cleft; ovary 3-loculed; infl not spike-like
 - n. Herbs with entire or compound herbaceous lvs **POLEMONIACEAE**
 - n. Dwarf evergreen shrubs with entire leathery lvs **DIAPENSIACEAE** (*Diapensia obovata*) [B]*

POLYPODIOPSIDA

- A. Spore cases relatively large, borne in terminal cluster, with sterile blade occurring laterally on a common stalk **OPHIOGLOSSACEAE**
- A. Spore cases minute, borne in clusters (sori) on back or near margins of green blades, or on separate modified fronds
 - B. Sori marginal; sori covered by a continuous indusium formed by reflexed margins of leaf segments **PTERIDACEAE**
 - B. Sori not marginal, sori not cover by a reflexed leaf segment margins
 - C. Fronds evergreen; sori naked, no indusia **POLYPODIACEAE** (*Polypodium sibiricum*) [B]
 - C. Fronds not evergreen; indusia peltate, opening on 1 side or absent
 - D. Sori elongate; fronds small; veins not reaching margin . **ASPLENIACEAE** (*Asplenium viride*) [B]*
 - D. Sori usually roundish, somewhat elongate; fronds large or small; veins reaching margin
 - E. Sporangia partly or wholly cover by rolled-up pinnules, a modified fertile frond **ONOCLEACEAE** (*Matteuccia struthiopteris* var. *pensylvanica*) [M]
 - E. Sporangia not in rolled-up pinnules; fertile fronds not distinctly modified

- F. Sori elongate or horseshoe-shaped. **ATHYRIACEAE**
- F. Sori round or nearly so
- G. Indusia absent
 - H. Fronds in a crown at end of a stout rhizome **ATHYRIACEAE**
 - H. Fronds borne singly along a cord-like rhizome
 - I. Fronds more or less ternate **CYSTOPTERIDACEAE**
 - I. Fronds pinnate-pinnatifid . **THELYPTRIDACEAE** (*Phegopteris connectilis*) [B]
- G. Indusia present
 - J. Indusia segmented; leaf veins not extending to margin ⁵⁴ **WOODSIACEAE**
 - J. Indusia not segmented; leaf veins extending to margin ⁵⁴
 - K. Indusia hood-shaped, attached by its base on side towards midvein; leaf veins reaching margins **CYSTOPTERIDACEAE**
 - K. Indusia round, reniform, or somewhat elongate
 - L. Sori round or reniform, usually attached in center . . . **DRYOPTERIDACEAE**
 - L. Sori somewhat elongate, often curved over end of veins; indusial attached on one side **ATHYRIACEAE**

KEYS TO GENERA AND SPECIES BY FAMILIES

ALISMATACEAE

- A. Lvs ovate or elliptic-lanceolate; stamens usually 6; carpels in single whorl on small flat receptacle ³⁴ *Alisma triviale* [M]*
- A. Lvs sagittate or hastate; stamens numerous; carpels crowded on large convex receptacle ³⁴ *Sagittaria cuneata* [M]

AMARANTHACEAE

- A. Stems jointed; lvs succulent, scale-like *Salicornia rubra* [M]+
- A. Stems not jointed; lvs not succulent, scale-like
 - B. Perennial with a woody base *Krascheninnikovia lanata* [M]*
 - B. Annual without a woody base
 - C. Flws not perfect (plants monoecious or dioecious) *Atriplex*
 - C. Flws perfect
 - D. Fruit mostly free, not enclosed by calyx lobes *Corispermum*
 - D. Fruit mostly enclosed in persisting calyx lobes
 - E. Lvs fleshy, entire, glabrous, narrowly linear or oblong; dwarf nonweedy annual of damp saline places *Suaeda calceoliformis* [M]
 - E. Lvs not fleshy, entire or toothed, glabrous or mealy-puberulent; annuals, mostly of weedy habit
 - F. Stem unbranched to sparsely branched ²⁶; basal lvs often forming a rosette ²⁶ *Blitum*
 - F. Stem usually branched ²⁶; basal lvs not in rosette ²⁶
 - G. Flws usually dimorphic, perianth of lateral flw with 3–5 segments ²⁶; seeds mostly vertical and/or horizontal ²⁶; stamens 1–3 ²⁶ . . . *Oxybasis rubra* var. *rubra* [B]*
 - G. Flws not dimorphic, perianth segments 5 ²⁶; seeds exclusively horizontal ²⁶; stamens usually 5 ^{17, 25, 31, 26}
 - H. Young stems and lvs densely covered with vesicular trichomes that become cup-shaped when dry and persistent at maturity ²⁶; perianth segments without prominent midvein visible on adaxial surface ²⁶ . . . *Chenopodium*
 - H. Young stems and lvs with completely collapsed vesicular trichomes when dry, rarely present at maturity ²⁶; perianth segments with prominent midvein visible on adaxial surface ²⁶ . . . *Chenopodium simplex* [M]*

Atriplex

- A. Leaf blades typically scurfy, margins entire to sparsely dentate ^{25, 92} *A. dioica* [M]*
- A. Leaf blades green on both sides, not notably scurfy, margins entire, toothed, or repand-denticulate ^{25, 92}
 - B. Fruiting bracteoles 2–20 mm long, rhombic to rhombic-triangular, or ovate-rhombic ^{25, 92} *A. patula* [X]
 - B. Fruiting bracteoles often >10 mm long, ovate or oblong to orbiculate ^{25, 92} . *A. gmelinii* var. *alaskensis* [B]+

Blitum

- A. Lvs lanceolate with a pair of divergent lobes near base; fruit mostly free of calyx, neither fleshy nor juicy at mature; seed pericarp pitted **B. nuttallianum** [B]*
- A. Lvs triangular to triangular-hastate; fruit mostly enclosed in persisting calyx, fleshy, at maturity bright red, juicy; seed pericarp smooth **B. capitatum ssp. capitatum** [M]*

Chenopodium

- A. Plants branched at base
 - B. Lvs several times longer than broad, linear, 1-veined ^{25.32} **C. leptophyllum** [M]
 - B. Lvs 2–4 times longer than broad, wider than linear
 - C. Plant erect ^{25.32}; leaf petioles 2–7 mm long ^{25.32}; pericarp adherent to achene; achene surface minutely granular-roughened ¹³, not very shiny **C. hians** [M]+
 - C. Plant prostrate to spreading ¹³; leaf petioles 2–3 mm long ¹³; pericarp and achene can be separated ¹³; achene surface very shiny and tessellate ¹³ **C. nitens** [M]+
- A. Plant branched above
 - D. Primary lvs linear, >5 times as long as wide **C. pratericola** [X]
 - D. Primary lvs deltoid, rhombic or ovate, <3 times longer than wide
 - E. Infl with irregularly round, 4–7 mm diameter glomerules; seed pericarp surface honey-combed pitted ^{25.32}; leaf petioles 20–90 mm long ^{25.32} **C. berlandieri ssp. zschackei** [M]
 - E. Infl with subglobose, 3–4 mm diameter glomerules ^{25.32}; seed pericarp smooth or mottled; leaf petioles 10–25 mm long ^{25.32} **C. album** [B]

Corispermum

- A. Plant <20 cm tall; infl densely compact, short-clavate to ovoid; fruit usually developed in axils of middle and lower lvs and branches; wings of fruit <0.4 mm wide ^{25.62} **C. ochotense var. alaskanum** [B]+
- A. Plants <70 cm tall ^{25.62}; infl lax to slightly condensed, interrupted only near base, linear; fruit developed in axils of inflorescence (infl) bracts; wings of fruit 0.7–1 mm wide ^{25.62} **C. pallasii** [M]+

APIACEAE

- A. Basal lvs simple, oblong-lanceolate to ovate-lanceolate, sessile **Bupleurum**
- A. Basal lvs compound, palmate or pinnately divided
 - B. Fruit clavate, >3 times longer than wide, bristly-hairy **Osmorhiza depauperata** [M]
 - B. Fruit <3 times as long as wide, not bristly-hairy
 - C. Ultimate segments of lvs long linear to lanceolate
 - D. Upper lvs once pinnate; fruit with winged ribs **Sium suave** [B]
 - D. Upper lvs twice pinnate; fruit with thick ribs that lacking distinct wings **Cicuta**
 - C. Ultimate segments of lvs not long and linear-lanceolate
 - E. Lfts <20 mm long
 - F. Plant with leafy flwing stem, >30 cm tall **Cnidium cnidiifolium** [B]*
 - F. Plant scapose, 5–20 cm tall **Podistera**
 - E. Lfts typically >50 mm long
 - G. Lvs 1-ternate or pinnately divided; stem and lvs pubescent **Heracleum**
 - G. Lvs 2–3 ternate; stem and lvs glabrous **Angelica**

Angelica

- A. Fruit slightly flattened ⁴⁷, lateral ribs scarcely winged, thin-edged ⁴⁷ **A. lucida** [B]
- A. Fruit strongly flattened dorsally ⁴⁷, lateral ribs broadly winged ⁴⁷ **A. archangelica** [X]+

Bupleurum

- A. Flw bractlets overlapping, equal to or short than umbel rays, usually pale yellow ²²; widespread **B. americanum** [B]
- A. Flw bractlets not overlapping, usually longer than umbel rays, green ²²; high latitudes and elevations **B. arcticum** [E]+

Cicuta

- A. Lfts linear with fascicles of bulblets in upper axils **C. bulbifera** [M]
- A. Lfts linear or lanceolate, bulblets lacking
 - B. Lfts 3–4 times as long as broad, lanceolate-ovate to oblong or elliptic ²⁰ **C. douglasii** [M]+
 - B. Lfts >4 times longer than broad, linear to narrowly lanceolate
 - C. Areas circumscribed by net-veins on abaxial leaf surface distinct elongate ³⁵; lfts linear to narrowly linear-lanceolate, serrate or slightly incised **C. virosa** [B]

- C. Areas circumscribed by net-veins on abaxial leaf surface not elongate ³⁵;
 lfts lanceolate, sharply serrate **C. maculata var. angustifolia** [M]

Heracleum

- A. Lvs 1-ternate; plant thinly tomentose when young **H. maximum** [B]*
 A. Lvs pinnate, 3–7 lfts; plant with spreading-pubescent and somewhat scabrous ⁴⁷ **H. sibiricum** [X]+

Podistera

- A. Lfts lobed or incised; flw petals purplish or white **P. macounii** [B]
 A. Lfts entire or with basal once pinnate or deeply cleft; flw petals yellowish white **P. yukonensis** [E]

ARACEAE

- A. Flw with a thick, dense, and fleshy spike subtended by large bract (spathe); rooted,
 wet terrestrial sites **Calla palustris** [B]
 A. Plant small, not differentiated into stem and lvs; floating or submersed aquatic
 B. Lvs 6–10 mm long, 3-lobed and stalked, forming tangled submerged mats **Lemna trisulca** [B]
 B. Lvs 2–5 mm long, round or elliptic, floating on water surface
 C. Plant olive to brown, with rootless turions ^{25,57} **L. turionifera** [M]+
 C. Plant usually lacking distinct turions
 D. Fronds reddish on abaxial surfaces, more apparent than on adaxial surface ^{25,57}, **L. turionifera** [M]+
 D. Fronds not reddish on abaxial surface or less so than on adaxial surface ^{25,57} **L. minor** [B]

ARALIACEAE

- A. Prickly shrub, <100 cm tall; lvs alternate, palmately 5–7 lobed **Oplopanax horridus** [M]
 A. Herbaceous, 30–40 cm tall; lvs basal, pinnately 3–5 foliate **Aralia nudicaulis** [M]

ASPARAGACEAE

Maianthemum

- A. Perianth 4-parted; lvs 2 or 3, pedicellate, cordate or nearly so **M. canadense ssp. interius** [M]
 A. Perianth 6-parted; lvs 2 or 3 or numerous, sessile, lanceolate or elliptic
 B. Stem with numerous lvs, 15–50 cm tall **M. stellatum** [M]
 B. Stem with 2 or 4 lvs, 4–20 cm tall **M. trifolium** [B]

ASTERACEAE

- A. Flws all ligulate and perfect; stem sap milky **GROUP 1**
 A. Flws not all ligulate; ray flws when present either pistillate or neutral; stem sap watery
 B. Flw heads with numerous petals
 C. Rays white or pink to purple **GROUP 2**
 C. Rays yellow or orange
 D. Pappus chaffy, or of firm awns, or none; receptacle chaffy, bristly or naked **GROUP 3**
 D. Pappus partly or wholly of capillary bristles, sometimes plumose;
 receptacle naked **GROUP 4**
 B. Flw heads generally lacking petals
 E. Pappus of numerous capillary bristles, in some plumose **GROUP 5**
 E. Pappus scaly, awned, very short chaffy bristles, or a mere crown or none **GROUP 6**

GROUP 1 (Flws all ligulate, perfect; juice milky)

- A. Plants scapose; lvs all basal; heads solitary on erect scapes; achenes beaked
 B. Involucral bracts of 2 distinctly different heights ³⁴; achenes spinulose toward summit **Taraxacum**
 B. Involucral bracts of several imbricate series of similar height ³⁴; achenes not spinulose **Agoseris**
 A. Plants more or less leafy-stemmed, although upper lvs often mere bracts;
 heads mostly several; achenes beaked or beakless
 C. Achenes flattened
 D. Achenes beakless; lvs prickly-margined; flws yellow **Sonchus**
 D. Achenes beaked; flws bluish purple **Lactuca biennis** [M]
 C. Achenes not flattened
 E. Pappus sordid or brownish; plant with fibrous roots **Hieracium**
 E. Pappus white; plant with taproot
 F. Pappus plumose bristles **Tragopogon**
 F. Pappus capillary bristles
 G. Perennial; lvs not auriculate ^{25,25} **Askellia**

G. Annual; lvs auriculate ^{25,26} **Crepis**

GROUP 2 (Rays present, not yellow or orange)

- A. Pappus, or at least in part, of capillary bristles; receptacle naked
 - B. Basal lvs cordate or sagittate **Petasites**
 - B. Basal lvs not cordate or sagittate
 - C. Involucral bracts subequal or imbricate, often green in part, but not definitely leafy, not with chartaceous base, with herbaceous green tip **Erigeron**
 - C. Involucral bracts that are either subequal or the outer leafy or more often imbricate, with chartaceous or distinctly green tips, or sometimes chartaceous throughout
 - D. Plant glandular, at least in upper part; involucral bracts glandular
 - E. Lvs linear **Symphyotrichum**
 - E. Lvs lanceolate or oblanceolate
 - F. Lvs lanceolate **Canadanthus modestus** [M]*
 - F. Lvs oblanceolate **Aster alpinus ssp. vierhapperi** [B]
 - D. Plant upper stem and involucral bracts not glandular
 - G. Pappus reddish brown **Eurybia sibirica** [B]*
 - G. Pappus not reddish brown
 - H. Heads not solitary, small <30 mm wide; involucral bracts <9 mm long .. **Symphyotrichum**
 - H. Heads usually solitary, 30–40 mm wide; involucral bracts 14–20 mm long **Aster alpinus ssp. vierhapperi** [B]
- A. Pappus of scales or awns or flattened, chaffy bristly, or a mere crown, or none
 - I. Basal lvs entire; pappus of numerous bristle-like scales **Townsendia hookeri** [B]
 - I. Basal lvs conspicuously toothed to pinnately dissected, upper sometimes entire; pappus lacking
 - J. Lvs all pinnately dissected
 - K. Heads small and numerous; rays about 5 in number, 2–3 mm long **Achillea**
 - K. Heads few, larger; rays numerous, 5–13 mm long **Tripleurospermum**
 - J. Lvs toothed, lobed, or entire
 - L. Basal lvs linear, entire **Hulteniella integrifolia** [B]*
 - L. Basal lvs broader, crenate or lobed
 - M. Basal lvs fleshy, cuneate at base, toothed in upper part; uppermost cauline lvs entire **Chrysanthemum arcticum ssp. polare** [B]
 - M. Basal lvs not fleshy, crenate-dentate; middle and upper cauline lvs conspicuously subpinnatifid at base **Leucanthemum vulgare** [X]*

GROUP 3 (Rays yellow or orange; pappus chaffy, or with firm awns, or none)

- A. Involucral bracts of 2 distinct and dissimilar series; rays radiate or discoid; receptacle chaffy; weedy annual **Bidens cernua** [B]
- A. Involucral bracts similar, in 2–3 series; rays conspicuous, receptacle merely bristly; perennial **Gaillardia aristata** [X]

GROUP 4 (Rays yellow or orange; pappus of capillary bristles; receptacle naked)

- A. Lvs opposite **Arnica**
- A. Lvs alternate, or all basal
 - B. Involucral bracts imbricate, in several series
 - C. Heads mostly solitary on each stem; lvs awl-like, to 10 mm long **Nastotus macleanii** [E]*
 - C. Heads several on each stem; lvs much broader and longer **Solidago**
 - B. Involucral bracts in one series
 - D. Lvs all cauline (no basal rosette)
 - E. Plant perennial **Senecio**
 - E. Plant annual or biennial
 - F. Lvs deeply pinnatifid; head discoid **Senecio**
 - F. Lvs entire or irregularly toothed; heads radiate **Tephrosieris**
 - D. Lvs mainly with basal rosettes and always broader and larger than those of stem
 - G. Heads solitary or sometimes with 1 or 2 smaller lateral heads
 - H. Involucral bracts glabrous **Packera**
 - H. Involucral bracts hirsute at base **Tephrosieris**
 - G. Heads 1 to many, all about same size
 - I. Plant with fibrous roots **Packera**

- I. Plant with a well-developed ascending rhizome
 - J. Inner involucre bracts prominently black-tipped; basal leaf sessile **Senecio**
 - J. Inner involucre bracts not black-tipped; basal leaf petioled
 - K. Flw peduncles lacking dense woolly, multicellular pubescent, glabrous **Packera**
 - K. Flw peduncles dense brownish- or yellowish-woolly pubescent with multicellular hairs
 - L. Stem delicate, 4–15 cm tall; basal leaf blades entire or crenate or deeply serrate or irregularly lobed **Packera**
 - L. Stem robust, 10–35 cm tall; basal leaf blades entire to denticulate ... **Tephrosia**

GROUP 5 (Heads discoid; pappus capillary)

- A. Receptacle densely bristly
 - B. Lvs spiny-margined **Cirsium**
 - B. Lvs not spiny-margined **Saussurea**
- A. Receptacle naked
 - C. Flws perfect, yellow or orange
 - D. Plants with a stout taproot **Nestor macleanii** [E]*
 - D. Plants with fibrous-rooted and branched base
 - E. Lvs mainly opposite **Arnica**
 - E. Lvs alternate
 - F. Involucre bracts essentially in a single series **Packera**
 - F. Involucre bracts in >1 series **Erigeron**
 - C. Flws not all perfect; petals white to purple, sometimes yellow (*Gnaphalium*)
 - G. Basal lvs cordate or sagittate, usually >5 cm wide and distinctly pubescent **Petasites**
 - G. Basal lvs not cordate or sagittate, usually <5 cm wide and not distinctly pubescent
 - H. Plants not white-woolly; involucre bracts lacking dry scarious tips
 - I. Involucre bracts in a single row **Erigeron**
 - I. Involucre bracts imbricate (see Group 2, "D" couplet)
 - H. Plants more or less white-woolly; involucre bracts mostly with dry scarious thin white or yellowish tips
 - J. Basal lvs soon deciduous but otherwise similar to cauline lvs ... **Anaphalis margaritacea** [B]
 - J. Basal lvs persistent; cauline lvs often reduced in size upward
 - K. Annual, low and much branched at base, lvs not concentrated near base of stem; flws perfect **Gnaphalium uliginosum** [X]
 - K. Perennials with low and matted habit; lvs often concentrated near base of stem; flws dioecious or gynodioecious **Antennaria**

GROUP 6 (Heads discoid; pappus not capillary)

- A. Involucre, at least in part, armed with hooked prickles or straight spines ³⁴
 - B. Involucre with hooked prickles ³⁴ **Arctium minus** [X]+
 - B. Involucre with straight spines ³⁴ **Centaurea**
- A. Involucre lacking prickles or spines
 - C. Subwoody to herbaceous plant, usually aromatic; plants with subwoody base, not rhizomatous or a taproot **Artemisia**
 - C. Herbaceous plants; usually not aromatic; plant rhizomatous or with taproot with few branches
 - D. Annual or biennial, with glabrous and finely dissected lvs **Matricaria discoidea** [B,X]*
 - D. Perennial, lvs 2- to 3-pinnate, glabrous or villous **Tanacetum**

Achillea

- A. Lvs mostly 2–3 pinnately dissected **A. millefolium** [M]
- A. Lvs once pinnate or merely toothed
 - B. Rays surpassing involucre by 1 mm ⁴⁷; lvs pectinately pinnatifid ⁴⁷ **A. alpina ssp. multiflora** [M]+
 - B. Rays surpassing involucre by 4–5 mm ⁴⁷; lvs appressed-serrulate ⁴⁷ **A. ptarmica** [X]+

Agoseris

- A. Flws orange or pink; beak of achene slender. **A. aurantiaca var. aurantiaca** [M]
- A. Flws yellow; achene beakless or with a stout beak. **A. glauca var. dasycephala** [M]*

Antennaria

- A. Basal lvs prominently 3–5 veined, similar in outline to lower cauline lvs; pistillate plants usually 30–65 cm tall **A. pulcherrima ssp. pulcherrima** [M]

- A. Basal lvs 1–veined (with 2 obscure lateral veins in some); cauline lvs usually reduced and of a different outline than basal lvs; pistillate plants usually <30 cm tall
- B. Flw stalks monocephalous, sometimes with 1 or 2 small lateral heads ³⁴ **A. monocephala**
- C. Plants dioecious; staminate and pistillate plants present in equal frequency in populations **ssp. monocephala** [B]
- C. Plants gynoeceous; staminate plants absent from population **ssp. angustata** [B]
- B. Flw stalks pleio- or polycephalous
- D. Largest basal lvs >6 mm wide and >20 mm long; phyllary tips white or ivory, to light brown, never pink or red or dark brown or dark green or black **A. howellii**
- E. Basal lvs 1–3 veined, >9 mm wide; phyllary tips light brown; flags usually absent from upper cauline lvs **ssp. howellii** [M]
- E. Basal lvs 1-veined, <9 mm wide; phyllary tips white or ivory; flags present on upper cauline lvs **ssp. canadensis** [M]
- D. Largest basal lvs <6 mm wide and <20 mm long, or if >20 mm long than <6.5 mm wide; or if lvs >6.5 mm wide then <20 mm long; phyllary tips white, ivory, pink, red or light to dark brown or dark green or black
- F. Plant tufted or caespitose, not mat-forming, rosettes sessile or subsessile, crowded on short rhizomatous caudices; upper cauline stems always beset with glandular hairs, hairs purple ^{25,24} **A. friesiana**
- G. Plants gynoeceous; staminate plants absent from population; pistillate involucre bracts dark olive or black **ssp. friesiana** [B]
- G. Plants dioecious; staminate and pistillate plants present in equal frequency in population; pistillate involucre bracts usually lighter, often dark brown to whitish **ssp. alaskana** [B]
- F. Plant caespitose, mat-forming, with rosettes borne at ends of well developed prostrate or ascending leafy stolons; upper cauline stems either beset with or without glandular hairs
- ← ←
- H. Basal lvs cuneate or cuneate-spatulate, <2 times longer than wide, caespitose, arising from short prostrate stolons; plant endemic to limestone talus **A. densifolia** [M]
- H. Basal lvs narrowly spatulate or oblanceolate, >2 times longer than wide, caespitose with well-developed prostrate stolons; plants of habitats other than limestone talus
- I. Scarios portion of phyllaries olivaceous, dark brown, greenish black, or black
- J. Flwing stem and lvs beset with glandular hairs, hairs purple ^{25,24}; plant dioecious (staminate and pistillate plants present in population in equal frequency) **A. friesiana ssp. neoalaskana** [B]
- J. Flw stem and lvs without glandular hairs; plants gynoeceous (staminate plants absent from population)
- K. Upper and middle cauline lvs with a flat linear scarious tip (flag), similar to tips of phyllaries **A. alpina** [B]
- K. Upper and middle cauline lvs with subulate or subulate-aristate tips
- L. Scarious portion of inner involucre bracts dirty blackish green throughout, tip acute ²⁸ **A. media** [M]
- L. Scarious portion of inner involucre bracts whitish at tip, or scarious portion discolored and brownish, tip blunt ²⁸ **A. umbrinella** [M]+
- I. Scarious portion of phyllaries not greenish black or black
- M. Plants dioecious, scarious portion of phyllaries white- or light yellow-tipped with green at base, upper stem beset with glandular hairs **A. microphylla** [M]
- M. Plants gynoeceous; scarious portion of phyllaries zoned with combinations of white, pink, rose, sanguine, and light brown; upper stem without glandular hairs; basal lvs dull gray **A. rosea**
- N. Longest lvs of flwing rosettes ≥20 mm long; phyllaries of various shades of white, pink, green, or red, but usually not brown **ssp. rosea** [M]
- N. Longest lvs of flwing rosettes <20 mm long; phyllaries of various shades of white, pink, green, red, or light brown
- O. Involucres <6.5 mm long; corolla ≤3.5 mm long; pappus usually ≤5 mm long; cauline lvs tapering to slender subulate tip; phyllaries usually brown distally, sometimes cream, gray, or yellow ^{25,24} **ssp. confinis** [M]
- O. Involucres ≥6.5 mm long; corolla >3.5 mm long; pappus usually >5 mm long; cauline lvs sometimes tipped with a flat lanceolate scarious appendage; phyllaries of various colors
- P. Flwing stems >17 cm tall; lowermost cauline lvs usually >19 mm long; heads usually 6–12 in number **ssp. arida** [M]
- P. Flwing stems <17 cm tall; lowermost cauline lvs usually ≤19 mm long;

heads usually 3–5 in number **ssp. pulvinata** [M]

Arnica

- A. Pappus brownish or straw-colored
 - B. Heads solitary, nodding; anthers dark purple **A. lessingii** [B]
 - B. Heads usually several, not nodding; anthers yellow
 - C. Ligules lacking **A. parryi** [M]
 - C. Ligules present
 - D. Stem lvs ≥ 5 pairs
 - E. Bracts acute to acuminate, hairy and stipitate-glandular; cauline lvs elliptic to ovate-lanceolate **A. lanceolata ssp. prima** [M]*
 - E. Bracts obtuse to acute, pilose but lacking stipitate glands; cauline lvs lanceolate to oblanceolate **A. chamissonis** [M]
 - D. Stem lvs mostly in 2–4(5) pairs
 - F. Middle stem lvs usually largest; head narrow, more or less turbinate **A. ovata** [M]*
 - F. Lower stem lvs usually largest; heads wider, nearly hemispherical **A. mollis** [M]
- A. Pappus milky white
 - G. Heads solitary, nodding in youth; lvs usually mainly basal **A. griscomii ssp. frigida** [B]
 - G. Heads 1 or more, erect or ascending; lvs mainly cauline
 - H. Basal and lower stem lvs elliptic or cordate
 - I. Mid-cauline lvs usually long-petioled; involucre surfaces white-pilose at base, puberulent above **A. cordifolia** [M]
 - I. Mid-cauline lvs sessile or subsessile; involucre surfaces usually with few or no long hairs **A. latifolia** [M]
 - H. Basal lvs narrowly lanceolate
 - J. Lower lvs long-petioled, blade denticulate with prominent veins **A. lonchophylla** [M]
 - J. Lower lvs short-petioled, blade entire or sometimes irregularly toothed, not with prominent veins **A. angustifolia**
 - K. Plant conspicuously white woolly-villous **ssp. tomentosa** [M]
 - K. Plants not conspicuously white woolly-villous **ssp. angustifolia** [M]

Artemisia

- A. Annual or biennial **A. biennis** [M]
- A. Perennial
 - B. Lvs glandular-dotted
 - C. Plants sticky glandular-dotted throughout; lvs typically 10–20 mm long, short petioled **A. woodii** [E]*
 - C. Lvs glandular-dotted; basal lvs to 200 mm long, long-petioled **A. laciniata ssp. laciniata** [B]
 - B. Lvs not glandular-dotted
 - D. Lvs all linear, or with lowermost ones 3-cleft at apex **A. dracunculus** [B]
 - D. Lvs variously lobed to 2–3 pinnate or palmate, or with uppermost ones sometimes linear
 - E. Stems 4–15 cm tall; infl mostly capitate
 - F. Flws purplish black; corolla glabrous **A. globularia ssp. globularia** [B]
 - F. Flws yellow; corollas usually hairy **A. glomerata** [B]
 - E. Stems usually taller; infl spike-like, racemose or paniculate
 - G. Mat-forming, with a stout woody and much-branched crown **A. frigida** [B]
 - G. Rhizomatous or caespitose, with a taproot or with a woody caudex
 - H. Lvs mainly cauline
 - I. Lvs bipinnatifid, with ultimate segments linear to oblanceolate, often toothed ²⁹; involucre bracts glabrous with hyaline margins **A. michauxiana** [M]
 - I. Lvs deeply divided or pinnatifid, with wide lobes ²⁹; involucre bracts somewhat pubescent with brown scarious margins **A. tilesii** [B]
 - H. Lvs mainly basal
- J. Basal lvs 2–3 pinnate
 - K. Flw heads usually ≥ 10 mm diameter, nodding
 - L. Infl open, glabrate or sparsely villous; lower peduncles elongate ²⁹ to 50 mm ^{25,78} **A. norvegica ssp. saxatilis** [B]
 - L. Infl spike-like, lanate ²⁹; lower peduncles short to sessile ⁴⁷ **A. comata** [B]+
 - K. Flw heads smaller, spreading to nodding
 - M. Heads 2–4 mm wide ³⁴; corolla pale yellow; stem 10–50 cm tall **A. campestris**

← ←

- N. Perennial, stems 2–5, basal rosette persistent ^{25,78} **ssp. pacifica** [M]+
- N. Biennial, stems usually 1, basal rosette not persistent ^{25,78} **ssp. caudata** [M]+
- M. Heads 4–6 mm wide ³⁴; corolla reddish; stem 10–25 cm tall ³⁴ **A. borealis**
- O. Lvs white-hoary; corollas lobes deep red, 3–3.5 mm long ^{25,78} **ssp. richardsoniana** [B]*
- O. Lvs villose-tomentose, glabrate or glabrous ^{25,78}; corolla lobes usually yellow-orange, 2–3 mm long ^{25,78} **ssp. borealis** [B]+
- J. Basal lvs once or twice ternately or palmately divided
- P. Flw stems arising from woody branches of previous season **A. alaskana** [B]
- P. Flw stems arising directly from caudex
- Q. Stems 4–8 cm tall; lvs more or less strigulose on both sides, with segments obtuse to acutish **A. hyperborea** [B]*
- Q. Stems 10–50 cm tall; lvs somewhat strigulose to densely silky-pilose, with segments acute **A. campestris** (see "N" couplet)

Askellia

- A. Stems 2–8 cm tall; lvs mostly basal rosette-like; alpine species **A. pygmaea** [B]*
- A. Stem 8–25 cm tall; lvs otherwise; lowland species **A. elegans** [M]*

Centaurea

- A. Lvs pinnatifid ²⁰ **C. stoebe ssp. australis** [X]+
- A. Lvs entire or with some teeth or lobes towards base ²⁰ **C. cyanus** [X]+

Cirsium

- A. Heads <25 mm tall; involucre 10–20 mm long ³⁴ **C. arvense** [X]+
- A. Heads >25 mm tall; involucre $\geq$ 20 mm long ³⁴ **C. foliosum** [M]

Crepis

- A. Adaxial surface of involucre bracts glabrous ^{25,25}; mature achenes <2.5 mm long, tawny or pale brown ³⁴; basal rosette present at flowering, stems several ³⁴ **C. capillaris** [X]+
- A. Adaxial surface of involucre bracts with appressed white hairs ^{25,25}; mature achenes >2.5 mm long, dark purplish brown ³⁴; basal rosette absent at flowering, stems solitary ³⁴ **C. tectorum** [B,X]

Erigeron

- A. Basal lvs slightly 3-lobed or once or more ternately divided
- B. Basal lvs once or more ternately divided, leaf segments <1 mm wide; involucre bracts with white multicellular hairs, somewhat glandular **E. compositus** [B]
- B. Early basal lvs sometimes shallowly-lobed or 3-cleft at apex
- C. Plants to 14 cm tall ^{25,64}; lvs linear to narrowly oblanceolate ^{25,64}, occasionally deeply cleft; involucre bracts sparsely pilose or glabrous, minutely glandular ^{25,64} **E. purpuratus** [B]
- C. Plant $\leq$ 6 cm tall ^{25,64}; lvs spatulate to oblanceolate-spatulate, occasionally shallowly lobed; involucre bracts densely lanate-villose ^{25,64} **E. denalii** [B]
- A. Lvs entire or serrate
- D. Upper stem lvs clasping
- E. Ligules 5–10 mm long, deep purple to white; stem usually branched **E. philadelphicus var. philadelphicus** [M]
- E. Ligules 8–16 mm long, purplish, pink or white; stems usually simple
- F. Bracts more or less pubescent with white hairs, ciliate **E. peregrinus var. peregrinus** [M]
- F. Bracts glandular on the back, occasionally with a few long hairs **E. glacialis var. glacialis** [M]+
- D. Upper stem lvs not clasping
- G. Ligules conspicuous, >2 times longer than pappus
- H. Lvs all linear; involucre bracts glabrous; lvs sparsely pubescent to glabrous **E. hyssopifolius** [M]
- H. Lvs broader at least the basal; involucre bracts pubescent; sparsely to densely pubescent
- I. Heads usually >1
- J. Plant pale or gray due to fine pubescence **E. caespitosus** [M]
- J. Plant not pale or gray
- K. Involucre bracts with spreading multicellular hairs ^{25,64}; basal lvs oblanceolate **E. glabellus var. pubescens** [M]
- K. Involucre bracts at least sparsely woolly-villous, crosswalls clear, and usually sparsely minutely glandular; basal lvs linear-oblanceolate or oblanceolate-obovate ^{25,64}

- L. Involucral bracts sparsely to moderately white-villous ^{25.64} with crinkly multicellular hairs; plant rhizomatous, sometimes resembling taproot ^{25.64} ***E. yukonensis*** [B]
 - L. Involucral bracts densely white pubescent, lacking crinkly multicellular hairs; plant with taproot ^{25.64} ***E. ochroleucus*** [B]+
 - I. Heads solitary
 - M. Involucral bract hairs lacking colored crosswalls ^{25.64}; petals 12–17 mm long ^{25.64}; stem sparsely to moderately villous, usually stipitate-glandular ^{25.64}; basal lvs oblong-ob lanceolate to narrowly obovate, 30–120 mm long ***E. porsildii*** [B]*
 - M. Involucral bract hairs or their crosswalls dark purplish ^{17, 25.64}; petals <15 mm long; basal lvs oblanceolate to spatulate, 10–50 mm long
 - N. Involucral bracts eglandular ^{25.64} ***E. muirii*** [B]
 - N. Involucral bracts glandular
 - O. Lvs 3-lobed or 3-dentate apically ^{25.64}; corolla 4–8 mm long ^{25.64}; plant 1–5 cm tall ^{25.64} ***E. denalii*** [B]+
 - O. Lvs acute to obtuse apically ^{25.64}; corolla 7–15 mm long ^{25.64}; plant <15 cm tall ^{25.64} ***E. hyperboreus*** [B]
- G. Ligules shorter
 - ← ←
- P. Stem simple; 1-headed
 - Q. Pappus purplish or pinkish
 - R. Lvs narrowly oblanceolate, 1–2 mm wide toward apex; involucre sparsely pilose to glabrous, crosswalls clear ^{25.64} ***E. purpuratus*** [B]
 - R. Lvs oblanceolate to spatulate, <5 mm wide toward apex ^{25.64}; involucre densely lanate-villous, often dark purple crosswalls ^{25.64} ***E. denalii*** [B]
 - Q. Pappus white, brownish, or sordid
 - S. Involucrum woolly, hairs lacking purplish crosswalls . . . ***E. uniflorus* var. *eriocephalus*** [B]
 - S. Involucrum villous, hairs usually with purplish black crosswalls
 - T. Plant 2–20 cm tall; leaf margin entire; ray florets 50–150 ^{25.64} ***E. humilis*** [B]
 - T. Plant 1–5 cm tall ^{25.64}; leaf margins entire, shallowly lobed or toothed apically ^{25.64}; ray florets 30–55 ^{25.64} ***E. denalii*** [B]
- P. Stems branched; often with >1 headed
 - U. Infl racemiform; peduncles erect; cauline lvs linear ***E. lonchophyllus*** [M]
 - U. Infl corymbiform; peduncles more or less spreading; cauline lvs wider
 - V. Involucre not glandular or nearly so; heads few or sometimes solitary ***E. elatus*** [M]
 - V. Involucre glandular; heads few to numerous
 - W. Plants <25 cm tall; lvs glandular and hirsute; cauline leaf petiole margins coarsely ciliate ^{25.64} ***E. nivalis*** [M]*
 - W. Plants >20 cm tall ^{25.64}; lvs glabrous or sparsely hirsute, sometimes glandular ^{25.64}; cauline leaf petiole margins not ciliate ^{25.64} . . . ***E. acris* var. *kamtschaticus*** [B]+

Hieracium/Pilosella

- A. Heads large, 10–20 mm in diameter; stems leafy ***H. umbellatum*** [B]
- A. Heads smaller, <10 mm in diameter, stems with few and reduced lvs
 - B. Flw ligules white or whitish ***H. albiflorum*** [M]
 - B. Flw ligules not white
 - C. Flw orangish red ²⁸ ***P. aurantiaca*** [M]+
 - C. Flw ligules yellow
 - D. Stem glabrous or stellate pubescent proximally ^{25.83}; involucre 7–10 mm long ^{25.83}; corolla 5–6 mm long ***H. triste*** [B]
 - D. Stem piloso-hirsute proximally, rarely glabrous ^{25.83}; involucre 5–7 mm long ^{25.83}; corolla 6–9 mm long ^{25.83} ***P. piloselloides*** [X]+

Packera

- A. Flw heads usually solitary or with 1 or 2 smaller lateral heads
 - B. Involucral bracts dark purple; achenes smooth ***P. heterophylla*** [B]*
 - B. Involucral bracts green; achenes hirsute ***P. hyperborealis*** [B]*
- A. Flw heads 1 or more, all about same size
 - C. Plant with well-developed rhizome; flw ligules usually well-developed and distinctively yellow
 - D. Involucral bracts glabrous; plant 15–40 cm tall; stems 1–5 ***P. streptanthifolia*** [M]*

- D. Involucral bracts tomentose; plant 4–15 cm tall; stems 1, often branched proximally, sometimes distally ^{25.85} *P. ogotorukensis* [B]*
- C. Plant with fibrous roots, taproot, or weakly-developed rhizome ^{25.85}; flw ligules absent, short, or pale yellow
 - E. Stems slender; basal lvs oval, subentire to serrate *P. paupercula* [M]*
 - E. Stem stout; basal lvs oblong-ovate, mostly deeply tooth
 - F. Flw heads usually >6, rays pale yellow *P. indecora* [M]*
 - F. Flw heads usually <6, rays reddish orange *P. pauciflora* [M]*

Petasites

- A. Lvs nearly entire or shallowly dentate, sagittate in outline; flw pappus usually >15 mm long ³⁴ *P. frigidus* var. *sagittatus* [M]*
- A. Lvs coarsely toothed to distinctly lobed, roughly palmate in outline; flw pappus ≤15 mm long ³⁴
 - B. Lvs coarsely toothed to lobed up to halfway to base ³⁴, usually longer than broad var. *frigidus* [B]
 - B. Lvs lobed more than halfway to base ³⁴, usually broader than long var. *palmatus* [M]

Saussurea

- A. Stems to 1 m or more tall; lvs triangular-ovate to cordate *S. americana* [M]
- A. Stems <40 cm tall; lvs linear to narrowly oblong or elliptic
 - B. Receptacle lacking hyaline scales ²⁹; involucral phyllaries linear to lanceolate ^{25.55}, outer about as long as inner ²⁹ *S. nuda* [B]+
 - B. Receptacle with hyaline scale ²⁹; outer involucral bracts ovate, inner lanceolate, outer much shorter than inner ^{25.55} *S. angustifolia*
 - C. Outer phyllaries usually 1.5–2 times longer than wide; stems 10–50 cm tall, lvs mostly 2–8 mm wide ^{25.55} var. *angustifolia* [B]
 - C. Outer phyllaries usually 2–4 times longer than wide; stems usually 3–15 cm tall, lvs often wider than 8 mm ^{25.55}
 - D. Lvs more or less arachnoid-tomentose, not or scarcely glandular-viscid ^{25.55} ... var. *yukonensis* [B]
 - D. Lvs tomentose throughout or villous and viscid-glandular on margins and abaxially on midvein ^{25.55} var. *viscida* [B]+

Senecio

- A. Lvs mainly basal and always broader and larger than those of stem; lower cauline lvs sessile, oblanceolate, entire, or their margins finely denticulate; involucral bracts prominently black-tipped *S. lugens* [M]
- A. Lvs essentially cauline (no basal rosette); lower cauline lvs petioles, margins distinctly toothed or pinnatifid; involucral bracts not prominently black-tipped
 - B. Annual or biennial; lvs deeply pinnatifid; heads discoid *S. vulgaris* [B]
 - B. Perennial; lvs not deeply pinnatifid; head not discoid
 - C. Lvs triangular-hastate; margins denticulate *S. triangularis* [M]
 - C. Lvs lanceolate to ovate; margins undulating-denticulate *S. sheldonensis* [B]

Solidago

- A. Stems usually >35 cm tall, from well developed rhizomes; involucre usually <4 mm tall *S. lepida*
- B. Flw heads a thyrsiform array, proximal branches ascending ^{25.76} var. *lepida* [X]+
- B. Flw heads a pyramidal paniculiform array; proximal branches arching to recurved ^{25.76} var. *salebrosa* [X]*
- A. Stems usually <35 cm tall from short rhizomes or a caudex; involucre usually >4 mm tall
 - C. Infl elongated; involucre 4–5.5 mm tall; bracts more or less glutinous or glandular *S. glutinosa* [M]*
 - C. Infl dense, corymbiform; involucre 5–8 mm tall; bracts neither glutinous nor glandular *S. multiradiata* [B]

Sonchus

- A. Annuals with short taproot; heads smaller, 15–25 mm wide *S. asper* [X]
- A. Perennials with long horizontal roots; heads relatively large, 30–50 mm wide *S. arvensis*
- B. Involucre and peduncles stipitate-glandular ⁴⁷ ssp. *arvensis* [X]+
- B. Involucre and peduncles glabrous or with small obscure tufted hairs ⁴⁷ ssp. *uliginosus* [X]

Symphyotrichum

- A. Plants glandular and involucral bracts, at least in the upper part *S. yukonense* [B]*
- A. Plant and involucral bracts not glandular

- B. Plants annual, simple or bushy branched; cauline lvs linear or narrowly lanceolate, 10–40 mm long *S. ciliatum* [B]*
- B. Plants perennial, usually simple, or grouped; cauline lvs oblanceolate to ovate, often longer; lower lvs not early deciduous ²⁰
 - C. Lower stem lvs with winged leaf petioles; blade of lower lvs shallowly cordate or sometimes rounded at base *S. ciliolatum* [M]*
 - C. Lower stem lvs not wing-petioled; blades of lower lvs oblanceolate to round at base ²⁰
 - D. Lvs all linear to linear-lanceolate, sometimes oblanceolate, generally entire
 - E. Stem more or less pubescent; lvs and involucre bracts spine-tipped *S. falcatum* var. *falcatum* [M]*
 - E. Stems puberulent generally only in lines below upper lvs; involucre bracts not spine-tipped *S. boreale* [M]*
 - D. Lvs broader, entire to serrate ²⁰
 - F. Outer involucre bracts with white margins near base ²⁰; lvs generally entire ²⁰ *S. foliaceum* var. *foliaceum* [M]+
 - F. Outer involucre bracts papery with yellow or brownish margins ²⁰; lvs toothed at base ²⁰ *S. subspicatum* [M]+

Tanacetum

- A. Stem villose, at least when young ³⁴ (check upper portions); lvs scarcely punctate ³⁴; heads few and large, disc 10–20 mm wide ³⁴ *T. bipinnatum* [B]
- A. Stem glabrous or nearly so ⁴⁷; lvs punctate; heads numerous and small, disc 5–10 mm wide ³⁴ *T. vulgare* [X]+

Taraxacum ^{25,27}

- A. Involucre bracts and outermost bractlets [calculus] usually prominently horned apically; mature achenes yellowish to olive-drab or brownish ¹⁷; leaf margin subentire to weakly toothed to pinnately lobed or pinnatifid ¹⁷ *T. ceratophorum* [B]
- A. Involucre bracts and calculus bractlets usually hornless, sometimes callous or horns relative small; mature achene color variable; lvs often deeply pinnatifid ¹⁷
 - B. Plants typically <40 cm tall; lvs ranging to 30 cm long ¹⁷, horizontal to erect; calculus bractlets usually reflexed to recurved
 - C. Leaf margins lacerate (lobes often lanceolate), terminal lobe narrow and similar lateral lobes ¹⁷; petioles more or less winged; fruit red to reddish-brown ¹⁷ or reddish purple *T. erythrospermum* [X]
 - C. Leaf margins usually shallowly to deeply lobed or toothed, occasionally lacerate, early lvs less deeply lobed, terminal lobe wider than lateral lobes ¹⁷; petioles narrowly to broadly winged ¹⁷; fruit yellowish to olive-drab ¹⁷ *T. officinale* [X]
 - B. Plant 1–12 (to 30 when in fruit) cm tall; lvs usually <12 cm long, horizontal to spreading (rarely erect), lobes often straight, deltate to triangular; calculus bractlets appressed to spreading, becoming reflexed when plant in fruit
 - D. Corolla pink, cream-colored to white or pink-tinged
 - E. Lvs deeply and regularly lobed or subentire; calculus bractlets horned; pappi white or sordid; mature achenes tan, yellowish to brown, sometimes grayish *T. hyparcticum* [B]+
 - E. Lvs sometimes shallowly lobed; calculus bractlets hornless; pappi yellowish; mature achenes grayish, greenish or yellowish *T. carneocolorum* [B]+
 - D. Corolla pale to dark yellow
 - F. Lvs oblanceolate to linear-oblanceolate, margins entire, toothed, or denticulate, teeth only sometimes pointed proximally; corollas pale to bright yellow; mature seeds dark brown, grayish or blackish *T. phymatocarpum* [B]*
 - F. Lvs oblanceolate to oblong-oblanceolate, margins regularly lobed, teeth pointed proximally, lobes straight, deltate to triangular; corolla yellowish; mature seeds usually yellowish to brown to reddish brown, sometimes grayish
 - G. Plant 1–5 cm tall; lvs blades 10–40 mm long, 0.5–1 cm wide; outer corollas 7.5–8.8 mm long; distal achene cone 0.5–0.6 mm long *T. scopulorum* [M]+
 - G. Plant 1–16 cm tall; leaf blades 10–120 mm long, 0.3–2.2 cm wide; outer corollas 11–14 mm; achene distal cone 0.8–1 mm long *T. alaskanum* [B]+

Tephrosieris

- A. Basal lvs inconspicuous; mostly cauline lvs, entire or irregularly toothed *T. palustris* [B]*
- A. Basal lvs mostly in rosettes and broader and larger than those of stem
 - B. Head >1, all about same size
 - C. Stem floccose-tomentose, hairs yellow ^{25,16}; corolla yellowish white or white ^{25,16} *T. yukonensis* [B]*
 - C. Stem sparsely to moderately hirsute ^{25,16}, hairs gray or white; corolla orange or orangish-yellow ^{25,16} *T. lindstroemii* [B]+
 - B. Heads solitary, or occasionally with 1–2 small lateral heads
 - D. Flw petals orangish-yellow, sometimes purple tinged, to 25 mm long ⁴⁷ *T. lindstroemii* [B]+
 - D. Flw petals yellow, typically half as long, sometimes absent
 - E. Involucral bracts with distinctly purple-septate hairs *T. frigida* [B]*
 - E. Involucral bracts and upper 1/3 of stem densely woolly with brown-septate hairs *T. kjellmanii* [B]*

Tragopogon

- A. Peduncle enlarged below head; involucral bracts about 13; achenes 25–35 mm long ³⁴ *T. dubius* [X]+
- A. Peduncle not enlarged below head; involucral bracts about 8; achenes 15–25 mm long ³⁴ *T. pratensis* [X]+

Tripleurospermum

- A. Involucral bracts with narrow colorless or light brown scarious margins *T. inodorum* [B]*
- A. Involucral bracts with broad dark brown scarious margins *T. maritimum* ssp. *phaeocephala* [B]+

ATHYRIACEAE

Athyrium

- A. Indusium lacking, sori round; blades more or less tripinnate ²⁹ *A. alpestre* ssp. *americanum* [B]
- A. Indusium curved or horseshoe-shaped; blades bipinnate ²⁹ *A. cyclosorum* [B]*

BETULACEAE

- A. Bracts of pistillate catkins papery, deciduous *Betula*
- A. Bracts of pistillate catkins woody, persistent *Alnus*

Alnus

- A. Lvs margin undulating to shallowly lobed, with doubly serrate-dentate teeth; nutlets wingless; often on flood sites *A. incana* ssp. *tenuifolia* [M]
- A. Lvs finely serrulate or biserrulate with sharp teeth; nutlets with broad winged-margined; usually not associated with frequently flooded sites
 - B. Leaf margin wavy, coarsely double-serrate ^{25,46}; blades thin, light green, slightly to moderately resin-coated abaxially ^{25,46} *A. alnobetula* ssp. *sinuata* [B]*
 - B. Leaf margin uniform, finely to densely double-toothed ^{25,46}; blades firm, dark green ^{25,46}, moderately to heavily resin-coated abaxially ^{25,46} ssp. *fruticosa* [B]+

Betula

- A. Trees at maturity, with white, yellowish to reddish exfoliating bark on trunk; lvs typically 30–70 mm long at maturity
 - B. Lvs deltoid in outline, truncate to broadly cuneate at base; twigs moderately to densely resinous glandular, usually glabrous
 - C. Samara wing as wide as or wider than nutlet ²⁰ *B. pendula* ssp. *mandshurica* [B]*
 - C. Samara wing equal to or narrower than nutlet ^{25,47, 32}
 - D. Branchlets resinous-verrucose and glabrous ³², resinous glands common ³² *B. × dugleana*+
 - D. Branchlets slightly to moderately pubescent, with scattered resinous glands ^{25,47} *B. kenaica* [B]+
 - B. Lvs ovate in outline, rounded or truncate at base, apex acute to short acuminate ²¹; twigs usually not glandular resinous, often pubescent ²¹
 - E. Lvs <40 mm long, with <7 pairs of lateral veins ²¹; bark usually gray to gold ²¹ *B. × utahensis*+
 - E. Lvs >50 mm long, with >7 pairs of lateral veins ²¹; bark whitish
 - F. Lvs >60 mm long, >8 pairs of lateral veins, 30–40 teeth per margin ²¹ *B. papyrifera* [M]+
 - F. Lvs <60 mm long, 7 pairs of lateral veins, 25–35 teeth per margin ²¹ *B. × winteri*+
- A. Large shrubs or small trees at maturity, with brownish non-exfoliating stem bark; lvs typically <40 mm long at maturity
 - G. Large shrub with shiny bark ²¹; leaf apex often acute to short-acuminate ^{21, 25,47}, margins serrate

- to doubly serrate ²¹; branchlets sometimes with reddish glands ²¹
- H. Bark brown to reddish brown; glands absent to sparse ^{25,47}; lvs with <25 teeth per margin ²¹ ***B. occidentalis*** [M]
- H. Bark yellowish brown; glands sparse; lvs >25 teeth per margin ²¹ ***B. × utahensis***+
- G. Small shrub with dull bark ²¹; lvs apex not distinctly acute ¹⁷, margins crenate to crenate-serrate ²¹; branchlets with yellow or white glands ²¹
- I. Lvs round, crenate, <10 crenations per side; wing of samara less than one-third of body width ¹⁷ ***Betula glandulosa*** [M]
- I. Lvs elliptic, ovate to obovate, crenate to crenate-serrate, usually >10 crenations per side; wings of samara equal to or greater than one-third of body width ¹⁷
- J. Branchlets with dense resinous glands; lvs truncate at base, lateral nerves 3 pairs ***B. nana* ssp. *exilis*** [B]
- J. Branchlets with scattered resinous glands; lvs cuneate to round at base ^{25,47}; lateral nerves (3)4–6 pairs ^{25,47, 34}
- K. Lvs round or ovate; branchlets with reddish and some yellowish resinous glands; samara wings slightly narrower than nutlet ***B. pumila*** [M]+
- K. Lvs elliptic to obovate; branches with yellow resinous glands ²¹; samara wing less than nutlet wide ²¹
- L. Lvs elliptic, 20–25 mm long, usually 10–15 crenations per margin. ***B. × sargentii***+
- L. Lvs broadly ovate, 20–40 mm long ²¹, 15–25 crenations per margin ²¹ .. ***B. × eastwoodae***+

BORAGINACEAE

- A. Coarse perennial herb; corolla blue to red purple; nutlets with numerous barbed-tipped prickles; infl racemose or racemose-like cyme ³⁴ ***Andersonglossum boreale*** [M]*
- A. Small perennial or annual; corolla blue or white or yellow; nutlets smooth or variously armed
- B. Corolla yellow; plant annual ***Amsinckia***
- B. Corolla not yellow, plant annual or perennial
- C. Flws nodding; corolla tubular
- D. Flws blue, occasionally white; infl cymose; stem mostly glabrous or with a few soft hairs ²⁰ ***Mertensia***
- D. Flws white, yellowish, or purplish ⁴⁷; infl arranged in sympodial to helicoid cyme ²⁸; stem with stiff spreading hairs ²⁰ ***Symphytum officinale*** [X]+
- C. Flws usually not nodding; corolla campanulate to rotate
- E. Pedicels reflexed in fruit ***Hackelia deflexa*** [X]
- E. Pedicels erect or spreading or very short
- F. Flws white ***Plagiobothrys scouleri* var. *hispidulus*** [X]+
- F. Flws blue (or white in albino forms)
- G. Plant annual or biennial; nutlet with hooked prickles ***Lappula***
- G. Plant perennial; nutlet lacking hooked prickles
- H. Stem to 10 cm tall; nutlets with jagged prickles on margins ***Eritrichium***
- H. Stem 5–40 cm tall; nutlets smooth ***Myosotis***

Amsinckia

- A. Corolla yellowish, 4–7 mm long, limbs 1–3 mm wide ²⁸ ***A. menziesii*** [X]
- A. Corolla orange to orangish yellow, 7–10 mm long ²⁸, limbs 4–6 mm wide ²⁸ ***A. intermedia*** [X]+

Eritrichium

- A. Basal lvs with more or less spreading and sometimes tangled hairs ^{37,42}, usually conspicuously pustulate ³⁶; flws <6 mm diameter, typically 4–8(10) per cymose cluster ³⁷ ... ***E. aretioides*** [B]
- A. Basal lvs with appressed hairs oriented toward apex (antrore) ^{37,42}, hairs sparsely to moderately pustulate ^{36, 37}; flws usually >6 mm diameter, typically 1–6 per cymose cluster ^{17, 29, 37}
- B. Basal lvs without tufts or a brush-like tip at apex, hairs usually pustulate ³⁷
- C. Flws 3–5 in compact cyme, 1–2 often remote ³⁷; basal leaf petioles distinct from blades ³⁷; cauline lvs 10–25 mm long ³⁷ ***E. boreale*** [B]+
- C. Flws usually 1–3(6) in terminal cluster ³⁷; basal leaf blade tapering into petiole ³⁷; cauline lvs 6–12 mm long ³⁷ ***E. grandiflorum*** [B]+
- B. Basal lvs with tufts or a brush-like tip at apex, hairs usually not pustulate
- D. Leaf blade tapering into petiole ***E. splendens*** [B]
- D. Leaf blade not tapering into petiole ³⁶ ***E. arctisibiricum*** [B]+

Lappula

- A. Nutlets with 2 rows of marginal prickles **L. squarrosa** [B]
- A. Nutlets with 1 row of marginal prickles **L. occidentalis** var. **occidentalis** [M]

Mertensia

- A. Decumbent seashore plant, with more or less fleshy glabrous and glaucous lvs **M. maritima**
 - B. Lvs ovate, apex subacute to slightly acuminate, on relative short petioles; calyx segments triangular and coming distinctly larger during fruit maturation (3.5 mm long, 2.8 mm wide); corolla 5–6 mm long⁴⁸ **ssp. maritima** [B]
 - B. Lvs broadly spatulate, apex rounded or obtuse; calyx segments ovate to narrowly cordate, not enlarging during fruit maturation (2 mm long, 1 mm wide); corolla 4–5 mm long⁴⁸ **ssp. tenella** [B]+
- A. Erect nonlittoral species, with more or less pubescent with nonglauous lvs
 - C. Lvs with short stiff hairs on margins and on adaxial surface, glabrous abaxially²⁹ **M. drummondii** [B]
 - C. Lvs more or less rough-hairy on both sides **M. paniculata**
 - D. Calyx lobes green, hairy on abaxial surface, not ciliate on margin **var. paniculata** [M]
 - D. Calyx lobes glaucous, glabrous on abaxial surface, ciliate on margin **var. alaskana** [B]

Myosotis

- A. Hairs of calyx straight and closely appressed; nonglandular⁴⁷ **M. scorpioides** [X]
- A. Hairs of calyx divergent and hooked or gland tipped⁴⁷
 - B. Corolla 2–3 mm wide, lobes spreading to ascending; calyx lobes slightly longer than the tube⁴⁷ **M. arvensis** [X]+
 - B. Corolla >4 mm wide³⁴, lobes spreading horizontally⁴⁷; calyx lobes distinctly longer than tube⁴⁷ **M. asiatica** [B]*

BRASSICACEAE

- A. Fruit ≤ 3 –4 times as long as wide
 - B. Plant essentially glabrous
 - C. Petals yellow
 - D. Lvs simple **Draba**
 - D. Lvs pinnatifid, at least some **Rorippa**
 - C. Petals not yellow
 - E. Siliques broad winged, orbicular to rounded-oblong, >9 mm long **Thlaspi arvense** [B]
 - E. Siliques wingless, lanceolate to narrowly obovate or shorter
 - F. Basal lvs narrow, linear to subulate; submerged aquatic plant **Subularia aquatica** [B]*
 - F. Basal leaf blades broader; terrestrial plant
 - G. Basal lvs roundish and broad, arctic seashores **Cochlearia groenlandica** [B]*
 - G. Basal lvs lanceolate; terrestrial or marginal of waterbodies
 - H. Silique apex notched, clavate²⁹ **Noccaea arctica** [B]*
 - H. Silique apex not notched, not clavate **Draba**
 - B. Plant pubescent
 - I. Silique apically notched, broadly winged; seeds usually solitary; petals absent or ≤ 1 mm long^{17, 34, 25.6} **Lepidium**
 - I. Silique apex not notched, not winged; petals present and longer
 - J. Petals white, pink to purple
 - K. Siliques obcordate-triangular **Capsella bursa-pastoris** [B,X]
 - K. Siliques not obcordate-triangular
 - L. Plant often with short densely gray-pubescent; siliques subclavate; basal lvs distinctly lobed distally **Smelowskia**
 - L. Plant not densely gray-pubescent; siliques not subclavate, but more commonly cylindrical or somewhat flattened; basal lvs essentially entire distally
 - M. Siliques linear, about 1 mm wide, somewhat torulose **Braya**
 - M. Siliques not linear but wider, not torulose
 - N. Plant pulvinate^{25.6} **Draba**
 - N. Plant not pulvinate **Braya**
 - J. Petals yellow or creamy white
 - O. Basal or cauline lvs pinnate or pinnatifid, or just apically lobed
 - P. Stem with short simple and dendritic trichomes at least proximally **Smelowskia**
 - P. Stem glabrous or with simple, but not multi-branched trichomes

- Q. Petals <4 mm long ^{25,6}; siliques <10 mm long ^{25,6} **Rorippa**
- Q. Petals >5 mm long; siliques 15–60 mm long ^{25,6} **Sinapis arvensis** [B,X]
- O. Basal and cauline lvs simple, margins usually not lobed
- R. Siliques lanceolate, ovate, ellipsoid, or oblong; seeds >2
- S. Siliques laterally compressed **Draba**
- S. Siliques subterete or slightly 4-angled ^{25,6} **Smelowskia**
- R. Siliques globular, pyriform, or ellipsoid in outline, seeds 1 or 2
- T. Basal lvs common; cauline lvs few **Physaria**
- T. Basal lvs few, withered at anthesis ^{25,6}, or absent; cauline lvs common ^{25,6}
- U. Stem and lvs gray-canescens from dense, appressed multi-rayed trichomes ^{25,6} **Odontarrhena obovatum** [B]*
- U. Stem and lvs with simple with some multi-rayed hairs ^{25,6} **Camelina microcarpa** [X]+
- A. Fruit >3 times as long as wide
- V. Basal and/or cauline lvs pinnate or pinnatifid
- W. Basal lvs lyrate-pinnatifid, with large terminal segment
- X. Petals white, pink to purple, sometimes greenish
- Y. Mid-cauline lvs oblanceolate in outline, sessile or short petiolate ^{25,6} **Arabidopsis**
- Y. Mid-cauline lvs distinctly pinnate, usually long petiolate
- Z. Cauline lvs with distinct lfts **Cardamine**
- Z. Cauline lvs dentate to pinnatifid ^{25,6} **Erucastrum gallicum** [X]+
- X. Petals yellow or yellowish
- a. Petal <5 mm long ⁴⁷; style <2 mm long ^{25,6} **Barbarea orthoceras** [B]
- a. Petal >4 mm long; style longer ^{25,6}
- b. Petals 6–13 mm long ^{25,6}; siliques 20–110 mm long, not torulose ^{25,6} **Brassica rapa** [X]
- b. Petals 4–8 mm long ^{25,6}; siliques 10–45 mm long ²⁸, slightly torulose ^{25,6} **Erucastrum gallicum** [X]+
- W. Basal and usually stem lvs pinnatifid, but lacking distinctively larger terminal segment
- c. Petals white, pink to purple
- d. Perennial; basal lvs with oval to obovate lfts, if lfts linear, plant rhizomatous **Cardamine**
- d. Annual; basal lvs pinnatifid with long linear segments; plant not rhizomatous **Sisymbrium**
- c. Petals white, yellow or yellowish
- e. Lvs coarsely pinnatifid or deeply lobed; siliques ellipsoid or elongate-cylindrical, or globose to pyriform, <9 mm long **Rorippa**
- e. Lvs finely dissected; siliques slender, linear or awl-shaped, terete to 4-angled, usually >9 mm long
- f. Plant more or less pubescent with forked and multi-branched hairs ⁴⁷ **Descurainia**
- f. Plant glabrous or moderately pubescent with simple hirsute hairs ⁴⁷ **Sisymbrium**
- V. Basal lvs simple
- g. Siliques oblong to linear-lanceolate, strap-like at maturity, 3.5–7.5 mm wide; leaf blades to 120 mm long, narrowly oblanceolate, entire or minutely to coarsely dentate ^{25,6} **Parrya nudicaulis** [B]
- g. Siliques linear, terete to somewhat compressed, <3 mm wide; leaf blades typically <60 mm long, lanceolate to ovate, entire, toothed, or pinnifid
- h. Upper stem and lvs glaucous ^{17,47}; cauline lvs clasping and auriculate **Turritis glabra** [B]*
- h. Upper stem and lvs not glaucous; cauline lvs not clasping and auricles
- i. Petal yellow, yellowish, or greenish
- j. Lower cauline lvs linear to oblanceolate; lvs and stem typically with appressed malpighiaceae hairs **Erysimum**
- j. Lower cauline lvs broad, auriculate; lvs and stem lacking malpighiaceae hairs **Brassica rapa** [X]
- i. Petal white, pink to purplish
- k. Basal lvs crowded; flwing stem <20 mm tall; infl immediately above lvs, umbel-like
- l. Petal 2–3 mm long; siliques oblong-ellipsoid, ascending, 5–15 mm long ^{25,6}, style 0.2–1 mm long ^{25,6} **Aphragmus eschscholtzianus** [B]
- l. Petals 4.5–7 mm long ^{25,6}; siliques linear, stiffly erect, 8–37 mm long, style 0.5–3 mm long ^{25,6} **Cardamine**
- k. Basal lvs rosulate or lacking; infl not umbel-like
- m. Lvs and stem with appressed malpighiaceae or 2–3 rayed trichomes ^{25,6} **Erysimum**
- m. Lvs and stem trichomes lacking appressed malpighiaceae or 2–3 rayed trichomes

- n. Basal lvs long-petioled, if absent, then cauline lvs clasping **Eutrema**
- n. Basal lvs sessile or short petioled
 - o. Petals <4.5 mm long ^{25.6}; stem usually much branched, spreading **Crucihimalaya bursifolia** [B]*
 - o. Petals usually ≥4 mm long; stem upright and usually simple
 - p. Mature siliques erect to strongly ascending, straight; leaf trichomes with stalked 1–4-rayed, rays unbranched ⁶ **Arabis**
 - p. Mature siliques secund or spreading to strongly reflexed, distinctly curved ⁶; leaf trichomes dendritic, irregularly, or bifurcate, sessile, which are sometimes branched ⁶ **Boecheira**

Arabidopsis

- A. Basal leaf blade margins entire or toothed, without distinctively separate terminal lobe, terminal lobe gradually tapering proximally; caudices well-developed, often branched, somewhat thickened ^{25.4} **A. lyrata ssp. petraea** [B]*
- A. Basal leaf blade margin lyrate or lyrate-pinnatifid with distinctive terminal lobe and 2 or more lateral segments; caudices often slender, unbranched or with a root crown ^{25.4} ... **ssp. kamchatica** [B]*

Arabis

- A. Base of middle cauline lvs attenuate, not clasping stem, margins entire, ciliate **A. nuttallii** [M]
- A. Base of middle cauline lvs auriculate or hastate- to sagittate-clasping stems; leaf margins usually dentate or toothed
 - B. Outer sepals not saccate ^{25.5}; petals 3–5.5 mm long ^{25.5}; mature siliques typically ≤1.2 mm wide ^{25.5}, erect or appressed to rachis ^{25.5} **A. pycnocarpa var. pycnocarpa** [M]*
 - B. Outer sepals moderately to markedly saccate; petals typically >5.5 mm long ^{25.5}; mature siliques >1 mm wide ^{25.5}, not appressed to rachis
 - C. Petals 5.5–10 mm long ^{25.5}; plant densely hirsute at least basally with simple or forked trichomes ^{25.5}; sepals 3.5–5 mm long ^{25.5}; silique valve midvein prominent ^{25.5} ... **A. eschscholtziana** [M]
 - C. Petals 10–19 mm long ^{25.5}; plant with sparse to moderately pubescence that commonly includes cruciform and stellate trichomes ^{25.5}; sepals 4.5–8 mm long ^{25.5}; silique valve midvein absent or obscure ^{25.5} **A. caucasica** [X]+

Boecheira ^{25.9}

- A. Base of middle cauline leaf blades neither auriculate nor clasping
 - B. Siliques strongly descending to pendulous **B. retrofracta** [M]*
 - B. Siliques ascending to erect **B. pendulocarpa** [X]+
- A. Base of middle cauline leaf blades auriculate or clasping
 - C. Rosette and cauline lvs glabrous or with some malpighiaceae hairs; lvs becoming absent with maturity **B. stricta** [M]*
 - C. Rosette and cauline lvs present and pubescent
 - D. Siliques all strongly descending, pendulous to downward appressed to rachis **B. retrofracta** [M]
 - D. Siliques mostly descending, spreading, ascending, strongly ascending to erect-appressed to rachis (i.e., upwardly directed)
 - E. Undersurfaces of caudex lvs with unbranched to few short stalked 2- to 3-rayed or forked trichomes
 - F. Siliques erect, often appressed to rachis
 - G. Basal and cauline lvs glabrous or with some malpighiaceae hairs only abaxially **B. stricta** [M]*
 - G. Basal and cauline lvs mostly with sessile 2-rayed trichomes, or short-stalked (<0.63 mm long) 2- to 3-rayed trichomes abaxially
 - H. Undersurface of caudex lvs mostly with unbranched sessile 3-rayed trichomes, with rays appressed to leaf surfaces; bases of middle cauline lvs strongly clasping stem **B. calderi** [M]*
 - H. Undersurface of caudex lvs mostly with unbranched to few-branched short stalked, 2- and 3-rayed trichomes; bases of middle cauline lvs cuneate, truncate to weakly auriculate **B. lyallii** [M]*
 - F. Siliques strongly descending to ascending
 - I. Biennial or short-lived perennial with compact caudex tending to become reduced in size as plant matures; stem 20–1020 cm tall ^{25.9} **B. grahamii** [M]*
 - I. Perennial with persistent often-branched caudexes; stems 7–40 cm tall

- J. Siliques 2–3.5 mm wide, spreading to strongly ascending; undersurface of caudex lvs with sessile to short stalked (<0.06 mm long), unbranched to 2- or 3-rayed trichomes 0.25–0.35 mm wide **B. drepanoloba** [M]*
- J. Siliques 1.5–1.75 mm wide, ascending; undersurface of caudex lvs with medium-stalked (0.06–0.12 mm long) unbranched to few-branched 2- and 3-forked trichomes 0.12–0.25 mm wide **B. lemmonii** [M]*
- E. Undersurfaces of caudex lvs with unbranched to many-branched 3- and 4-rayed or forked trichomes
 - K. Trichomes on undersurface of caudex lvs short-stalked (<0.06 mm long), mostly 0.125 mm wide; siliques 1.25–2 mm wide; flw petals <6 mm long **B. lemmonii** [M]*
 - K. Trichomes on undersurface of caudex lvs sessile to medium-stalked (to 0.12 mm long), mostly 0.25–0.35 mm wide; siliques 1.75–3 mm wide; flw petals 5–8 mm long ^{25,9}
 - L. Infl second; trichomes on undersurfaces of caudex lvs sessile to short-stalked; siliques 2.25–3 mm wide; plant 10–40 cm tall **B. drepanoloba** [M]*
 - L. Infl symmetrical; trichomes on underside of caudex lvs medium-stalked (0.06–0.12 mm long); siliques 1.75–2 mm wide; plant 15–115 cm tall **B. pauciflora** [M]*

Braya

- A. Flw stems with ≥ 1 lvs; mature siliques about 1 mm wide ³⁴ **B. humilis ssp. humilis** [B]
- A. Flw stems scapose or with a single leaf or bract subtending lowermost flws; mature siliques 2–3 mm wide ³⁴
 - B. Siliques oblong to narrowly oblong-lanceolate, 3.5–8.3 times longer than broad ^{25,49}; fruiting infl loosely elongated **B. glabella ssp. glabella** [B]
 - B. Siliques oval-elliptic to oblong-elliptic, 2.5–3.7 times longer than wide ^{25,49}; fruiting infl usually densely compact **B. purpurascens** [B]*

Cardamine

- A. Basal lvs ovate and entire; plant typically <10 cm tall **C. bellidifolia** [B]
- A. Basal lvs pinnate; plant typically taller
 - B. Petals ≤ 5 mm long; terminal lft of basal lvs distinctly larger than lateral lfts
 - C. Infl subumbellate; lateral lfts of cauline lvs obovate to oblanceolate **C. umbellata** [B]*
 - C. Infl racemose, more elongate; lateral lfts of cauline lvs linear to oblong or oblanceolate
 - D. Cauline leaf petioles eciliate ⁴⁷; basal lvs generally absent ^{25,10} **C. pensylvanica** [M]
 - D. Cauline leaf petioles conspicuously hirsute to ciliate ⁴⁷; basal lvs present ^{25,10} **C. oligosperma** [M]+
 - B. Petals >5 mm long; terminal lft of basal lvs not distinctly larger than lateral lfts
 - E. Cauline lfts broad, ovate to elliptic or oval to obovate ^{25,10}
 - F. Plant totally glabrous; flws usually white or purplish ^{25,10}; anthers 1–1.5 mm long ^{25,10} **C. microphylla** [B]
 - F. Plant pubescent distally; flws pink to purple or white; anthers <1 mm long ^{25,10} **C. purpurea** [B]
 - E. Cauline lfts narrow, linear to oblanceolate, or oblong ^{25,10}
 - G. Flw petals white, 5–9 mm long ^{25,10}; sepals not saccate basally ^{25,10} **C. digitata** [B]
 - G. Flws petals milky white to pink, 9–12 mm long ^{25,10}; sepals saccate ^{25,10} **C. polemonioides** [B]+

Descurainia

- A. Silique usually clavate (wider distally) or broadly linear; rounded to obtuse at apex **D. pinnata ssp. brachycarpa** [X]+
- A. Siliques linear to narrowly oblong, acute to acuminate at apex
 - B. Developing siliques overtopping the subumbellate infl ¹⁷ **D. sophioides** [B]
 - B. Developing siliques well below apex of elongating infl
 - C. Siliques usually appressed to rachis ^{25,48} **D. incana** [M]
 - C. Siliques not appressed to rachis ^{25,48}
 - D. Leaf blades 2–3-pinnate ^{25,48}; fruit septum appearing 2–3-veined ^{25,48} **D. sophia** [B]
 - D. Leaf blades usually 1-pinnate ^{25,48}, rarely 2-pinnate ^{25,48}; fruit septums not or 1-veined ^{25,48}
 - E. Petals <1.2 mm long ^{25,48}; fruit <10 mm long ^{25,48}; anthers <0.2 mm long ^{25,48}; plant eglandular ^{25,48} **D. nelsonii** [M]*
 - E. Petals >1.7 mm long ^{25,48}; fruit 8–20 mm long ^{25,48}; anthers 0.3–0.4 mm long ^{25,48}; plant glandular or eglandular ^{25,48} **D. incisa ssp. incisa** [M]+

- A. Flws with petals present
 - B. Flwing stem completely glabrous or essentially so
 - C. Anthers ≤ 0.3 mm long
 - D. Petal yellow or yellowish (sometimes fading to white)
 - E. Basal lvs usually pubescent, with 2–5-rayed trichomes adaxially, simple and 2-rayed adaxially; raceme pubescent; petals 2.7–4 mm long, 1–2 mm wide . . . *D. macounii* [M]
 - E. Basal lvs glabrous or with sparse simple and 2-rayed trichomes abaxially and adaxially; raceme glabrous; petals 1.5–3 mm long, 0.5–1 mm wide *D. crassifolia* [B]
 - D. Petal white
 - F. Basal lvs glabrous or with simple and 2-rayed trichomes abaxially, usually glabrous adaxially *D. fladnizensis* [B]
 - F. Basal lvs dominated by stellate 6– or 8–12-rayed trichomes abaxially
 - G. Anthers 0.2–0.3 mm long; sepals with simple and 2–5-rayed trichomes; basal lvs glabrous basally or with simple and branched trichomes adaxially; 8–12-rayed trichomes abaxially *D. lonchocarpa* [B]
 - G. Anthers about 0.2 mm long; sepals with simple and 2-rayed trichomes; basal lvs with 6–12-rayed stellate trichomes abaxially and adaxially, or with simple trichomes proximally half adaxially *D. porsildii* [M]
 - C. Anthers > 0.3 mm long
 - H. Petals white; basal lvs with 4– or 8–12-rayed trichomes abaxially
 - I. Basal lvs with stellate-pectinate trichomes abaxially *D. glabella* [B]
 - I. Basal lvs lacking stellate-pectinate trichomes abaxially
 - J. Style 0.4–1 mm long; sepals pubescent subapically with simple and 2-rayed trichomes *D. mulliganii* [B]+
 - J. Style 0.1–0.4 mm long; sepals glabrous, rarely pubescent subapically with simple trichomes *D. lactea* [B]
 - H. Petals yellow or yellowish; basal lvs with simple, 2–4-rayed, or pectinate trichomes
 - K. Basal lvs with pectinate trichomes abaxially; plant pulvinate *D. oligosperma* [M]
 - K. Basal lvs glabrous or 2–4-rayed trichomes abaxially; plant pulvinate or not
 - L. Petal 1–2 mm wide; sepals sparsely pubescent with 2–4-rayed trichomes; plant pulvinate *D. densifolia* [M]+
 - L. Petals 2–3 mm wide; sepals glabrous, simple, and/or 2-rayed trichomes; plant not pulvinate
 - M. Plant stoloniferous with only a few remnant petiole bases; sepals glabrous or with only simple trichomes; cauline lvs 0–2 *D. ogilviensis* [E]
 - M. Plant not stoloniferous; sepals pubescent with simple and 2-rayed trichomes; basal lvs imbricate; cauline lvs 0 *D. pilosa* [B]+
 - B. Flwing stem pubescent proximally, including sparsely so (if stem absent, rachis pubescent)
 - N. Petals ≤ 0.8 mm wide, < 2 mm long, not yellow when fresh
 - O. Stigma distinctly bi-lobed, style lacking $\varnothing$; abaxial surface of basal lvs with stellate trichomes $\varnothing$ *D. caswellii* [E]+
 - O. Stigma not bi-lobed; style to 0.3 mm long; abaxial surface of basal lvs with mostly simple and 2-rayed trichomes
 - P. Flw stem with long simple and shorter 2–6-rayed trichomes *D. yukonensis* [E]
 - P. Flw stem with simple trichomes, pubescence pilose *D. kluaniei* [E]
 - N. Petals wider or longer, either white or yellow
 - Q. Anther < 0.3 mm long
 - R. Petals dark to pale yellow
 - S. Infl within the immediate proximity of basal lvs; plant typically < 6 cm tall
 - T. Style 0.1–0.5 mm long; flw petals spatulate; sepals sometimes pubescent; siliques inflated at base *D. macounii* [M]
 - T. Style < 0.1 mm long; flw petals oblanceolate; sepals glabrous; siliques not inflated at base *D. crassifolia* [B]
 - S. Infl distinctly separated from basal lvs; plant typically to 40 cm tall
 - U. Sepals with simple and 2-rayed trichomes; basal lvs with stalked 3–6-rayed trichomes abaxially; raceme pubescent *D. praealta* [M]
 - U. Sepals glabrous or with only simple trichomes; basal lvs trichomes with > 2 rays on abaxial surface, except *D. crassifolia*; raceme usually glabrous
 - V. Cauline lvs 4–15; basal lvs sparsely to densely pubescent with 2–3-rayed and cruciform trichomes *D. nemorosa* [B]

- V. Cauline lvs 0–5; basal lvs lacking cruciform trichomes
 - W. Basal lvs with only 3–4-rayed trichomes abaxially; flw stem pubescent proximally with stalked 2–4-rays *D. stenoloba* [M]
 - W. Basal lvs and flw stem trichomes simple and/or 2-rayed
 - X. Basal lvs glabrous or sparsely pubescent with simple and 2-rayed trichomes abaxially; cauline lvs typically 0–1, stem pubescent proximally with simple trichomes. *D. crassifolia* [B]
 - X. Basal lvs with 2–4-rayed trichomes abaxially; cauline lvs typically 0–3; stem pubescent proximally with simple and some 2-rayed trichomes *D. albertina* [M]
- R. Petals white to off-white
 - Y. Basal lvs with 3–6 rayed trichomes abaxially, 3–5-rayed and simple trichomes adaxially; styles <0.15 mm long *D. praealta* [M]
 - Y. Basal lvs with greater contrast in pubescence types between adaxial and abaxial surface, and trichomes with up to 12-rays
 - Z. Plant to 40 mm tall ⁹
 - a. Stem leafless; raceme 4–15-flwd ⁹; sepals <1.5 mm long ⁹ *D. franktonii* [B]+
 - a. Stem with cauline lvs; raceme typically 15–47-flwd; sepals 1.5–2 mm long *D. cana* [B]
 - Z. Plant usually <15 cm tall
 - b. Cauline lvs ≥ 2
 - c. Raceme >10-flwd; anthers <0.2 mm long; basal leaf margins sometimes dentate *D. cana* [B]
 - c. Raceme 3–9-flwd; anthers >0.2 mm long; basal leaf margins entire *D. lonchocarpa* [B]
 - b. Cauline lvs 0–1
 - d. Anthers about 0.2 mm long; sepals with simple and 2-rayed trichomes; flw stem with 3–5-rayed trichomes *D. porsildii* [M]
 - d. Anthers 0.2–0.3 mm long; sepals with simple and 2–5-rayed trichomes; flw stem with 8–15-rayed trichomes
 - e. Basal lvs glabrous or with simple and long-stalked branched trichomes adaxially; silique glabrous or with 3–6-rayed trichomes *D. nivalis* [B]
 - e. Basal lvs with short-stalked 8–15-rayed trichomes adaxially; siliques with simple or minutely stalked 2-rayed trichomes *D. lonchocarpa* [B]
- Q. Anthers ≥ 0.3 mm long
 - f. Flw stem completely glabrous or essentially so distally
 - g. Flw stem leafless, or only one reduced to bract
 - h. Petal white or whitish; basal lvs with 8–16-rayed trichomes abaxially
 - i. Petals 3.2–4 mm long; sepals 1.7–2.2 mm long, with subapical simple and 2-rayed trichomes *D. mulliganii* [B]+
 - i. Petals 4.5–5.5 mm long; sepals 2–2.5 mm long, with simple and short-stalked 2–6-rayed trichomes *D. palanderiana* [B]
 - h. Petal yellow or yellowish (sometimes fading white); basal lvs glabrous or with 1–4-rayed trichomes
 - j. Basal lvs with essentially only stalked cruciform trichomes abaxially; sepals glabrous or pubescent subapically with simple and 2-rayed trichomes *D. juvenilis* [B]
 - j. Basal lvs lacking just cruciform trichomes abaxially; sepals glabrous or pubescent not confined to subapical positions, trichomes simple, 2-, or 3-rayed
 - k. Flw stem with long simple and sometimes shorter 2–4-rayed trichomes adaxially *D. ruaxes* [M]
 - k. Flw stem trichomes of similar height
 - l. Petals 2.5–3.5 mm long; basal lvs lacking pectinate trichomes; plant to 34 cm tall *D. stenoloba* [M]
 - l. Petals 4–6 mm long; basal lvs with pectinate trichomes abaxially; plant to 21 cm tall *D. incerta* [M]
 - g. Flw stem with lvs
 - m. Petals yellow or yellowish

- n. Basal leaf blades oblanceolate to lanceolate, lacking ciliate margins; sepals ovate; flw petals spatulate; anthers 0.4–0.5 mm long; styles >0.2 mm long ***D. juvenilis*** [B]
 - n. Basal leaf blades oblanceolate to obovate, with ciliate margins; sepals oblong; flw petals oblanceolate; anthers 0.25–0.4 mm long; styles <0.15 mm long ***D. stenoloba*** [M]
 - m. Petals white
 - o. Basal lvs with cruciform or 2–3-rayed trichomes abaxially. ***D. murrayi*** [B]
 - o. Basal lvs with stellate-pectinate trichomes abaxially ***D. glabella*** [B]
 - f. Flw stem pubescent distally
 - p. Flw stem with developed lvs, often numerous
 - q. Petals yellow or yellowish
 - r. Flw stem lvs ≥ 5 ; basal lvs with stalked mostly 4–7-rayed trichomes . . . ***D. aurea*** [M]
 - r. Flw stem lvs ≤ 3 ; basal lvs with stalked cruciform trichomes ***D. juvenilis*** [B]
 - q. Petals white
 - s. Flw stem lacking commonly occurring simple trichomes; petal 3.5–4.5 mm long ***D. cinerea*** [B]
 - s. Flw stem with commonly occurring simple trichomes; petals 4–6 mm long
 - t. Basal leaf blades with cruciform or 2–6-rayed trichomes abaxially; sepals ovate, with simple trichomes ***D. borealis*** [B]
 - t. Basal leaf blades with stellate-pectinate 4–12-rayed trichomes abaxially; sepals oblong, with simple and 2–4-rayed trichomes . . ***D. glabella*** [B]
 - p. Flw stem leafless or with 1 reduced to a bract
 - u. Petals purple, linear ***D. stenopetala*** [B]
 - u. Petals white or yellow
 - v. Petals white
 - w. Petal spatulate to obovate, 3.5–4.5 mm long; anthers 0.3–0.4 mm long ***D. cinerea*** [B]
 - w. Petals obovate to broadly oblanceolate, 3–3.5 mm long; anthers about 0.4 mm long ⁹ ***D. thompsonii*** [M]+
 - v. Petal yellow or yellowish
 - x. Stigma distinctly wider than style; style 0.6–1 mm long ***D. corymbosa*** [B]
 - x. Stigma not distinctly wider than style
 - y. Petals linear, <0.7 mm wide ***D. stenopetala*** [B]
 - y. Petals not linear and broader
- ← ←
- z. Plant stoloniferous with a few residual petioles ***D. ogilviensis*** [E]
 - z. Plant not stoloniferous
 - A. Plant pulvinate
 - B. Basal leaf blades lacking pectinate trichomes abaxially ⁸; petal 5–6.5 mm long, early deciduous, sparsely pubescent, simple and 2-rayed trichomes ⁸ ***D. bruce-bennettii*** [E]+
 - B. Basal lvs with pectinate trichomes abaxially; petals usually <5 mm long, not early deciduous, not pubescent
 - C. Petals 4–6 mm long; sepals pubescent with simple and 2–3-rayed trichomes; basal leaf blades to 25 mm, long, 1–5 mm wide ***D. incerta*** [M]
 - C. Petals 2.5–4 mm long; sepals glabrous or sparsely pubescent with pectinate, 2-rayed or simple trichomes; basal leaf blades to 15 mm long, <1.5 mm wide, trichomes often concentrated at apex ⁵ ***D. oligosperma*** [M]
 - A. Plant densely matted or caespitose, not pulvinate
 - D. Basal leaf blades with simple and fewer 2-rayed trichomes abaxially
 - E. Petals 0.5–0.8 mm wide; style 0.1–0.4 mm long ***D. aleutica*** [B]+
 - E. Petals 1.7–2.5 mm wide ⁹; style 0.4–0.8 mm long ⁹ ***D. bennettii*** [B]+
 - D. Basal leaf blade mostly with ≥ 2 -rayed trichomes abaxially
 - F. Basal leaf blades with long simple and shorter 2–4-rayed trichomes abaxially ***D. pilosa*** [B]+
 - F. Basal leaf blade trichomes similar in height
 - G. Basal leaf blades with short-stalked pectinate trichomes abaxially ***D. incerta*** [M]
 - G. Basal leaf blades lacking pectinate trichomes abaxially
 - H. Basal leaf blades predominately cruciform trichomes abaxially ***D. juvenilis*** [B]
 - H. Basal leaf blades usually lack cruciform trichomes abaxially

- I. Sepals oblong, pubescent subapical with simple trichomes *D. scotteri* [E]
 - I. Sepals ovate, pubescent not limited subapex area
 - J. Plant caespitose; anthers >0.5 mm long; caudex branches creeping; sepals with 2–6-rayed trichomes *D. ventosa* [M]
 - J. Plant tufted; anther 0.4–0.5 mm long; caudex branches not creeping; sepals with simple and 2-rayed trichomes *D. ruaxes* [M]
 - A. Flws lacking petals, fruit present
 - B. Flw stem leafless or 1 reduced to a small bract
 - C. Flw stem glabrous proximally
 - D. Infl occurring within close proximity to basal lvs; plant pulvinate or densely matted
 - E. Blades of basal lvs with sparse to dense, long, simple hairs, pilose abaxially *D. aleutica* [B]+
 - E. Blades of basal lvs glabrous or with scattered 2–4-rayed trichomes abaxially *D. densifolia* [M]+
 - D. Infl elevated above lvs
 - F. Mature silique valves pubescent or puberulent
 - G. Mature siliques inflated at least basally; blades of basal lvs with pectinate trichomes abaxially *D. oligosperma* [M]
 - G. Mature siliques not inflated; blades of basal lvs lacking pectinate trichomes abaxially
 - H. Blades of basal lvs with 8–12-rayed trichomes abaxially *D. lonchocarpa* [B]
 - H. Blades of basal lvs with simple and 2–4-rayed trichomes abaxially *D. pilosa* [B]+
 - F. Mature silique valves glabrous
 - I. Mature silique inflated at least basally
 - J. Basal leaf blades with 2–5-rayed trichomes abaxially *D. macounii* [M]
 - J. Basal leaf blades with pectinate trichomes abaxially *D. oligosperma* [M]
 - I. Mature silique valves not inflated
 - K. Abaxial leaf surface with stellate 4–12-rayed trichomes
 - L. Siliques 6–18 mm long, linear to narrowly lanceolate or narrowly oblong *D. lonchocarpa* [B]
 - L. Siliques 4–8 mm long, elliptic-lanceolate to broadly ovate or oblong
 - M. Basal leaf blades oblanceolate to obovate, typically 2–6 mm wide; style 0.1–0.4 mm long *D. lactea* [B]
 - M. Basal leaf blades oblanceolate or lanceolate, typically 1–2 mm wide; style 0.4–1 mm long ^{7, 25, 11} *D. mulliganii* [B]+
 - K. Abaxial leaf surface typically glabrous or with commonly or sparsely occurring 1–4-rayed trichomes
 - N. Siliques 3–4 mm wide *D. pilosa* [B]+
 - N. Siliques <3 mm wide
 - O. Plant stoloniferous ^{25, 11} with terminal leafy rosettes ¹⁷ and few petiole remains on stolon; basal leaf blades oblanceolate or lanceolate *D. ogilviensis* [E]
 - O. Plant not stoloniferous ¹⁷; basal leaf blades oblanceolate to obovate
 - P. Style <0.1 mm long; fruiting pedicels horizontal to divaricate-ascending; plant annual or short-lived perennial; seeds 0.7–0.8 mm long, 0.4–0.5 mm wide *D. crassifolia* [B]
 - P. Style 0.05–0.3 mm long; fruiting pedicels divaricate-ascending; plant perennial; seeds 0.8–1 mm long, 0.5–0.6 mm wider *D. fladnizensis* [B]
 - C. Flw stem pubescent or at least sparsely so proximally
 - Q. Flw stem glabrous distally
 - R. Mature siliques pubescent or puberulent with simple and 2-rayed trichomes
 - S. Abaxial surface of basal leaf blades with pectinate trichomes *D. incerta* [M]
 - S. Abaxial surface of blades of basal lvs lacking pectinate trichomes
 - T. Abaxial surface of blades of basal lvs with 8–12-rayed trichomes, margins entire *D. lonchocarpa* [B]
 - T. Abaxial surface of blades of basal lvs with 3–4-rayed trichomes, blade margins either entire or denticulate *D. stenoloba* [M]
 - R. Mature siliques glabrous to very sparsely puberulent
 - U. Abaxial surface of blades of basal lvs glabrous or with simple, 2- to 6-rayed, cruciform, or pectinate trichomes
 - V. Basal leaf blades include pectinate trichomes *D. incerta* [M]

- V. Basal leaf blades lacking pectinate trichomes
 - W. Basal leaf blades dominated by stalked cruciform trichomes abaxially *D. juvenilis* [B]
 - W. Basal leaf blades not dominated by cruciform trichomes abaxially
 - X. Basal leaf blades with 2–4-rayed trichomes on both surfaces *D. stenoloba* [M]
 - X. Basal leaf blades glabrous or with simple and 2-rayed trichomes adaxially
 - Y. Abaxial basal leaf surface glabrous or with simple and 2-rayed trichomes *D. crassifolia* [B]
 - Y. Abaxial basal leaf surface with stalked, 2–4-rayed trichomes *D. albertina* [M]
- U. Abaxial surface of lvs with 4- to 16-rayed trichomes, excluding cruciform trichomes
 - Z. Stem with 3–5-rayed trichomes; siliques glabrous *D. porsildii* [M]
 - Z. Flw stem with 4–12-rayed trichomes
 - a. Siliques sparsely puberulent with simple and minutely 2-rayed trichomes *D. lonchocarpa* [B]
 - a. Siliques glabrous
 - b. Siliques 6–18 mm long and styles 0.05–0.35 mm long *D. lonchocarpa* [B]
 - b. Siliques 4–8 mm long and styles 0.1–1 mm long
 - c. Siliques with 12–16 ovules
 - d. Blades of basal lvs 1–2 mm wide; style 0.4–1 mm long *D. mulliganii* [B]+
 - d. Blades of basal lvs typically 2–6 mm wide; style 0.1–0.4 mm long *D. lactea* [B]
 - c. Siliques with 18–32 ovules
 - e. Abaxial basal leaf midvein prominent and thickened; style 0.1–0.4 mm long *D. lactea* [B]
 - e. Abaxial basal leaf midvein obscure; style 0.3–0.8 mm long *D. palanderiana* [B]
 - Q. Flw stem pubescent distally, including sparsely pubescent
 - f. Infl occurring immediately above densely caespitose or pulvinate
 - g. Mature siliques obovoid to subglobose; basal leaf blades pilose with simple hairs abaxially *D. aleutica* [B]+
 - g. Mature siliques ovoid, ovate-lanceolate, or oblong; basal lvs blades glabrous or pubescent, but not pilose abaxially
 - h. Blades of basal lvs glabrous or with 2–5-rayed trichomes abaxially; siliques not inflated basally *D. densifolia* [M]+
 - h. Blades of basal lvs with 3–4-rayed trichomes abaxially; siliques inflated basally ^a *D. bruce-bennettii* [E]+
 - f. Infl elevated above basal lvs

← ←

 - i. Mature silique valves glabrous
 - j. Abaxial basal leaf surfaces with simple to 6-rayed or pectinate trichomes
 - k. Abaxial leaf surfaces with essentially only cruciform trichomes *D. juvenilis* [B]
 - k. Abaxial leaf surfaces pubescence lacking cruciform trichomes
 - l. Abaxial leaf surface includes pectinate trichomes *D. incerta* [M]
 - l. Abaxial leaf surface lacking pectinate trichomes
 - m. Plant with creeping stolons; stem base lacking dead dry lvs *D. ogilviensis* [E]
 - m. Plant lacking stolons, caudex branches sometimes covered with dead and dry lvs
 - n. Blades of basal lvs with simple and 2- to 5-rayed trichomes abaxially
 - o. Siliques suborbicular, inflated basally *D. stenopetala* [B]
 - o. Siliques elliptic to lanceolate, not inflated *D. pilosa* [B]+
 - n. Blades of basal lvs with 2–5-rayed trichomes abaxially, simple trichomes generally absent
 - p. Siliques subglobose to ovoid or ellipsoid, inflated at least basally, 4–8 mm long; style 0.1–0.5 mm long *D. macouni* [M]
 - p. Siliques lanceolate to narrowly elliptic or linear, not inflated, 4–15 mm long; style <0.12 mm long *D. albertina* [M]
 - j. Abaxial basal leaf surfaces with 4–16-rayed trichomes, not cruciform

- q. Mature siliques twisted to >1 rotation, often tortuous⁹ *D. thompsonii* [M]+
- q. Mature siliques not or only slightly twisted
 - r. Mature siliques at least 4–5 times longer than wide, linear to narrowly oblong, to 15–18 mm long *D. lonchocarpa* [B]
 - r. Mature siliques <4 times longer than wide, elliptic to oblong, <9 mm long
 - s. Stigma flattened parallel to septum⁹; plant to 5 cm tall⁹
 - t. Stigma somewhat 2-lobed⁹; fruit pedicels 0.5–1 mm long⁹ *D. franktonii* [B]+
 - t. Stigma strongly 2-lobed⁹; fruit pedicels 1.5–2.5 mm long⁹ *D. caswellii* [E]+
 - s. Stigma not flattened parallel to septum
 - u. Stem with 8–15-rayed trichomes; mature siliques sometimes twisted; fruit pedicels usually shorter than silique¹⁷ *D. nivalis* [B]
 - u. Stem with 2–9-rayed trichomes; mature siliques not twisted, but often lopsided due to aborted growth; fruit pedicels equal to or longer than silique¹⁷ *D. palanderiana* [B]
- i. Mature silique valves pubescent or puberulent
 - v. Siliques 1.5–3 mm wide
 - w. Silique values lacking simple hairs, with 2–5-rayed trichomes *D. cinerea* [B]
 - w. Silique values with at least some simple hairs
 - x. Basal leaf blades with pectinate trichomes abaxially *D. incerta* [M]
 - x. Basal leaf blades lacking pectinate trichomes abaxially
 - y. Stem with 8–12-rayed trichomes *D. lonchocarpa* [B]
 - y. Stem with 2- to 8-rayed trichomes
 - z. Styles 0.3–1 mm long; stem trichomes 2–8-rayed; siliques 5–11 mm long *D. scotteri* [E]
 - z. Style <0.2 mm long; stem trichomes 2–4-rayed; siliques 8–20 mm long *D. stenoloba* [M]
 - v. Mature siliques 3–6 mm wide
 - A. Basal leaf blades with simple and 2-rayed trichomes on both sides⁹ *D. bennettii* [B]+
 - A. Basal leaf blades surfaces not with simple and 2-rayed trichomes on both sides
 - B. Basal leaf blades with pectinate trichomes abaxially
 - C. Siliques inflated at least basally; flw stem with pectinate trichomes *D. oligosperma* [M]
 - C. Siliques not inflated at base; flw stem with mostly simple and 2–5-rayed trichomes, sometimes with subpectinate trichomes *D. incerta* [M]
 - B. Basal leaf blades lacking pectinate trichomes abaxially
 - D. Basal leaf blades with long simple, and shorter 2–4-rayed trichomes on both sides, or only simple hairs adaxially *D. pilosa* [B]+
 - D. Basal leaf blade trichomes on abaxial surfaces of similar height
 - E. Stigma much wider than style; siliques with simple and 2–3-rayed trichomes *D. corymbosa* [B]
 - E. Stigma about as wide as style; siliques glabrous, 1–2-rayed, or lacking simple trichomes
 - F. Siliques glabrous or with simple hairs, inflated basally *D. stenopetala* [B]
 - F. Siliques with simple and including more branched trichomes; silique not inflated basally
 - G. Siliques with 2-rayed trichomes and leaf blades of basal lvs with 2–10-rayed trichomes abaxially *D. ruaxes* [M]
 - G. Siliques and blades of basal lvs with 2–6-rayed trichomes abaxially *D. ventosa* [M]
 - B. Stem with 1 or more lvs
 - H. Stem glabrous proximally and distally
 - I. Stem glabrous proximally
 - J. Blades of basal lvs glabrous abaxially
 - K. Plant stoloniferous *D. ogilviensis* [E]
 - K. Plant not stoloniferous
 - L. Style 0.1–0.3 mm; basal leaf blades <16 mm long, dead lvs persistent at stem base; petioles obscure *D. fladnizensis* [B]
 - L. Style <0.1 mm long; basal leaf blades <30 mm long, dead lvs not normally persistent at stem base²⁹; petioles readily apparent *D. crassifolia* [B]
 - J. Blades of basal lvs not glabrous abaxially
 - M. Basal leaf blades trichomes stellate-pectinate abaxially; mature siliques

- values sometimes inflated, glabrous or with simple or 2–4-rayed trichomes . *D. glabella* [B]
- M. Basal leaf blades with stellate trichomes abaxially; mature siliques values not inflated, glabrous or with sparse simple and 2-rayed trichomes *D. lonchocarpa* [B]
- I. Stem pubescent proximally
- N. Stem pubescent distally
- O. Mature siliques valves essentially glabrous
- P. Flwing stem with 8–15-rayed trichomes
- Q. Adaxial leaf surface with short-stalked 8–15 rayed trichomes *D. nivalis* [B]
- Q. Adaxial leaf surface glabrous basally or with simple and long-stalked branched trichomes *D. lonchocarpa* [B]
- P. Flwing stem typically with fewer rayed or stellate-pectinate trichomes
- R. Abaxial basal leaf surfaces with 4–12-rayed stellate-pectinate trichomes *D. glabella* [B]
- R. Abaxial basal leaf surfaces glabrous, fewer rayed, or cruciform trichomes
- S. Plant stoloniferous; basal leaf blades glabrous or sparsely pubescent with simple and 2–4-rayed trichomes both abaxially and adaxially *D. ogilviensis* [E]
- S. Plant not stoloniferous; basal leaf blades with different sets of abaxial and adaxial trichomes
- T. Basal leaf blades with stalked cruciform trichomes abaxially, cruciform and/or 1–2-rayed trichomes adaxially; style 0.2–0.7 mm long *D. juvenilis* [B]
- T. Basal leaf blades with short-stalked 3–4-rayed trichomes abaxially, simple and stalked 2–4-rayed trichomes adaxially; style <0.15 mm long *D. stenoloba* [M]
- O. Mature siliques valves pubescent
- U. Mature siliques >5 times longer than wide
- V. Basal lvs and stem with 8–12-rayed trichomes abaxially; *D. lonchocarpa* [B]
- V. Basal lvs with 3–4 –rayed trichomes abaxially; stem with 2–4-rayed trichomes *D. stenoloba* [M]
- U. Mature siliques <5 times longer than wide
- W. Mature siliques <5 mm long
- X. Stem mostly only simple hairs, pilose *D. klaunei* [E]
- X. Stem with simple and 2–6-rayed trichomes
- Y. Stem base with common and persistent leaf remains; not stoloniferous *D. yukonensis* [E]
- Y. Stem base with few persistent leaf remains; stoloniferous *D. ogilviensis* [E]
- W. Mature siliques >5 mm long
- Z. Stem trichomes include stellate-pectinate types *D. glabella* [B]
- Z. Stem trichomes lacking stellate-pectinate trichomes
- a. Siliques values with simple as well as other trichome types
- b. Stems lacking 3–8-rayed trichomes *D. glabella* [B]
- b. Stems with 3–8-rayed trichomes
- c. Style <0.15 mm long *D. praealta* [M]
- c. Style >0.2 mm long
- d. Flw pedicels appressed to stem ¹⁷; pedicels typically 3–13 mm long; sepals with simple and branched trichomes *D. aurea* [M]
- d. Flw pedicels spreading ¹⁷; pedicels typically 2–5 mm long; sepals with simple trichomes *D. borealis* [B]
- a. Siliques values essentially lacking simple hairs
- e. Cauline lvs 1–5 lvs; siliques oblong to elliptic, 2–5-rayed trichomes *D. cinerea* [B]
- e. Cauline lvs 2–25 lvs; siliques usually linear to lanceolate, sometimes ovate or oblong, trichomes not only 2–5-rayed
- f. Siliques with 3–7-rayed trichomes; stem with simple and 4–10-rayed trichomes *D. cana* [B]
- f. Siliques with 2–4-rayed trichomes; stem with simple and 2-rayed trichomes *D. glabella* [B]
- N. Stem glabrous distally
- g. Basal leaf blades with mostly cruciform trichomes abaxially; mature

- siliques usually glabrous; cauline lvs 1–3 *D. juvenilis* [B]
- g. Basal leaf blades not essentially dominated by cruciform trichomes abaxially
 - h. Abaxial leaf blade surfaces with 6–12-rayed trichomes
 - i. Siliques 6–18 mm long, glabrous or sparsely puberulent with 2-rayed trichomes; stem with 8–12-rayed trichomes *D. lonchocarpa* [B]
 - i. Siliques 4–7.5 mm long, glabrous; stem with 3–5-rayed trichomes *D. porsildii* [B]
 - h. Abaxial leaf blade surfaces usually with <5-rayed trichomes
 - j. Style 0.6–1.5 mm long *D. murrayi* [B]
 - j. Style <0.15 mm long
 - k. Cauline lvs 4–15; basal lvs usually dentate or denticulate; leaf surfaces with 2- or 3-rayed with cruciform trichomes; plant annual, often lacking basal rosette *D. nemorosa* [B]
 - k. Cauline lvs 1–5; basal lvs usually entire, if denticulate; plant biennial or perennial
 - l. Abaxial leaf blade surfaces with simple and 2–4-rayed adaxially; stem unbranched, with 2–4-rayed trichomes proximally; raceme typically 4–10-flowered *D. stenoloba* [M]
 - l. Abaxial leaf blade surfaces with simple and 2-rayed adaxially; stem often branched distally, with mostly simple and sometimes a few 2-rayed trichomes proximally; raceme typical 6–30-flowered *D. albertina* [M]

Erysimum

- A. Petals purple; mature siliques usually somewhat curved *E. pallasii* [B]
- A. Petals typically yellow; mature siliques usually straight
 - B. Mature siliques usually <30 mm long; lvs with mostly 3–4-rayed trichomes; petals <5.5 mm and sepals <4 mm long ^{25.2} *E. cheiranthoides* [B]
 - B. Mature siliques usually >30 mm long; lvs with 2–3-rayed trichomes ^{25.2}
 - C. Sepals >8 mm long ^{25.2}; petals 13–22 mm long ^{25.2} *E. angustatum* [E]
 - C. Sepals <8 mm long ^{25.2}; petals <15 mm long ^{25.2}
 - D. Siliques >1.5 mm wide; style 0.5–1.5 mm long ^{25.2}; stem usually solitary ⁴⁷; lvs usually green and crowded ⁴⁷; petals dark yellow ⁴⁷, limbs 4.5–6 mm long, about 1 mm broad *E. coarctatum* [M]
 - D. Siliques >1.5 mm wide; style 0.7–3 mm long ^{25.2}; stem usually >1 ⁴⁷; lvs grayish and not crowded ⁴⁷; petals pale yellow ⁴⁷, limbs of petals 2.5–3 mm long, 1.5–2 mm broad *E. inconspicuum* [M]

Eutrema

- A. Stem lvs clasping; basal lvs often disappearing *E. salsugineum* [M]*
- A. Stem lvs not clasping; basal lvs persistent *E. edwardsii* [B]

Lepidium

- A. Mid-stem lvs slightly toothed to entire; siliques widest above middle, apical teeth rounded ³⁴ *L. densiflorum* [M]
- A. Mid-stem lvs pinnate or bipinnately divided; siliques widest at or below middle, apical teeth acute ³⁴ *L. ramosissimum* [M]*

Physaria

- A. Petal 5–7 mm long and about half as broad above middle ⁴²; fruit mostly uncompressed ^{25.65} *P. arctica* [B]*
- A. Petals 7–10 mm long and almost as broad above the middle ⁴²; fruit usually compressed ^{25.65} *P. calderi* [E]*

Rorippa

- A. Plant stem ascending, decumbent, or prostrate, usually several stems originating from base ^{25.3}; basal and lower cauline lvs entire ³⁴; petals 0.5–1.8 mm long ^{25.3} *R. curvipes* [X]+
- A. Plant stem erect, usually 1 stem from base ^{25.3}; basal or lower cauline lvs lobed to pinnatifid ^{25.3}; flw petals 1.5–3.5 mm long ^{25.3}
 - B. Silique globose to pyriform, 4-valved *R. barbareifolia* [B]
 - B. Silique ellipsoid or oblongate-cylindrical, 2-valved *R. palustris*
 - C. Stem and abaxial leaf blade surface usually densely hirsute ^{25.3} *ssp. hispida* [B]
 - C. Stem base and abaxial leaf blade surface usually glabrous, but sometimes

sparsely pubescent proximally ^{25.3} **ssp. palustris** [B]

Sisymbrium

- A. Upper stem lvs with pinnatifid filiform or elongate-linear segments ⁴⁷; mature siliques 50–100 mm long **S. altissimum** [X]
- A. Upper stem lvs with lanceolate to ovate or triangular segments ⁴⁷; mature siliques <50 mm long ^{25.7}
 - B. Petals 6–8 mm long ^{25.7}; fruiting pedicels not appressed to rachis ³⁴; mature siliques 20–50 mm long ^{25.7} **S. loeselii** [X]+
 - B. Petals <4 mm long ⁴⁷; fruiting pedicels appressed to rachis ³⁴; mature siliques subulate-linear <20 mm long ^{25.7} **S. officinale** [X]+

Smelowskia

- A. Flws purple ¹⁷ to lavender ^{25.8}; stem simple **S. borealis** [B]
- A. Flws creamy white or creamy white ^{25.8}; stem commonly branched near base
 - B. Basal leaf margins pinnatifid as long narrow segments ^{25.8} **S. media** [B]+
 - B. Basal leaf margins entire, usually linear to spatulate, rarely toothed or lobed apically ^{25.8} **S. porsildii** [B]+

CAMPANULACEAE

- A. Flws >3 per stem; corolla lobed half-way or less to base ²⁰
 - B. Corolla 20–30 mm long ³⁴; infl secund ³⁴; stem lvs ≥10 mm wide ³⁴ **Campanula rapunculoides** [X]+
 - B. Corolla 10–20 mm long ³⁴; infl not secund ³⁴; stem lvs <10 mm wide ³⁴ **C. rotundifolia** [B]
- A. Flws single, rarely 2, and terminal
 - C. Calyx glabrous; corolla lobed to near base **C. aurita** [B]
 - C. Calyx pubescent; corolla lobed half or less to base
 - D. Lvs entire; corolla funnel-shaped, 6–12 mm long ²⁰ **Melanocalyx uniflora** [B]*
 - D. Lvs dentate; corolla bell-shaped, 15–35 mm long **Campanula lasiocarpa** [B]

CAPRIFOLIACEAE

- A. Stem twining or reclining; flws in terminal cluster **Lonicera dioica** [M]
- A. Stem erect or ascending; flws paired in leaf axils ⁴⁷ **L. tatarica** [X]+

CARYOPHYLLACEAE

- A. Sepals united into a tube; petals free, pink or white
 - B. Styles >2 **Silene**
 - B. Styles 2
 - C. Flws solitary or few in a branching cyme; petals pink **Dianthus**
 - C. Flws in open corymbiform panicle; petals white **Gypsophila elegans** [X]
- A. Sepals and petals free, not united below; petal white
 - D. Lvs with scarios stipules **Spergularia rubra** [X]
 - D. Lvs without stipules
 - E. Petals deeply cleft or notched, or lacking
 - F. Styles usually 3; capsule ovoid or ellipsoid **Stellaria**
 - F. Styles usually 5 (sometimes 3); capsule cylindrical **Cerastium**
 - E. Petals entire or shallowly notched
 - G. Lvs narrow, acute; styles 3–5
 - H. Styles 4 or 5; flw buds spherical **Sagina**
 - H. Styles normally 3 ¹⁹; flw buds oblong
 - I. Capsules dehiscent by 6 teeth; lvs filiform, >20–80 mm long ^{25.71} **Eremogone capillaris var. capillaris** [B]*
 - I. Capsules dehiscent by 3 teeth; lvs <20 mm long, not filiform
 - J. Stem glabrous **Sabulina**
 - J. Stem or lvs pubescent or at least ciliate-margined **Cherleria**
 - G. Lvs broad, oval or oblong; styles 3
 - K. Capsules inflated, 3–4 locular **Wilhelmsia physodes** [B]
 - K. Capsules sometimes broad but not inflated, 1-locular
 - L. Capsule opening with 3 valves; lvs fleshy **Honckenya peploides ssp. diffusa** [B]
 - L. Capsule opening with 6 valves; lvs not fleshy
 - M. Lvs 6–35 mm long, broadly elliptic to oblong-elliptic ^{25.71}; seeds shiny, with a pale spongy appendage **Moehringia lateriflora** [B]
 - M. Lvs 2–6 mm long, lanceolate to ovate-lanceolate; seeds dull, without a spongy appendage **Arenaria longipedunculata** [B]

Cerastium

- A. Plant annual, lacking basal offshoots and petals as long as long or slightly longer than sepals ²⁹
 - B. Cauline lvs ovate to elliptic-ovate ²⁰; flws generally in clusters, peduncles shorter than sepals ²⁰ **C. glomeratum** [X]
 - B. Cauline lvs lanceolate to narrowly elliptic ²⁰; flws not tightly clustered, peduncles distinctly longer than sepals ²⁰ **C. nutans var. nutans** [M]+
- A. Plant perennial, plant sometimes with basal offshoots and petals equal to or much longer than sepals ^{17, 20}
 - C. Petals 16–24 mm long **C. maximum** [B]
 - C. Petals smaller
 - D. Petals about as long as sepals **C. fontanum ssp. vulgare** [X]*
 - D. Petals longer than sepals
 - E. Lvs lanceolate to lance-oblong; axillary shoots not present **C. beerianum** [B]
 - E. Lvs narrowly lanceolate to linear-subulate; conspicuous axillary shoots usually present **C. arvense ssp. strictum** [M]+

Cherleria

- A. Lvs very narrow, 7–8 times longer than broad, 10–18 mm long ^{25.70}, appearing glabrous, but with distinctly ciliate margins **C. yukonensis** [B]*
- A. Lvs 4–5 times longer than broad, usually <10 mm long ^{25.70}
 - B. Petals narrowly oblong; seeds smooth ¹⁷ or obscurely sculptured ^{25.70} **C. biflora** [B]*
 - B. Petals spatulate or clawed ^{25.70}; seeds not smooth
 - C. Lvs linear to oblong, or narrowly lanceolate; capsules 10–18 mm long **Pseudocherleria macrocarpa** [B]*
 - C. Lvs linear to awl-shaped, particularly cauline lvs; capsules <10 mm long ^{25.70}
 - D. Lvs not stiff ¹⁷, obscurely 1-veined, blades 5–20 mm long, axillary lvs absent ^{25.70}; capsules 9–10 mm long; seeds 1.2–1.6 mm long ^{25.70} **C. arctica** [B]*
 - D. Lvs stiff ¹⁷, 3-angled, 3-veined abaxially, midrib prominent, blades 1–8 mm long, axillary lvs present ^{25.70}; capsules 3.5–6 mm long; seeds 0.6–0.7 mm long ^{25.70} **C. obtusiloba** [B]*

Dianthus

- A. Lvs linear, tapering to a sharp point; calyx cylindrical; flws pink **D. plumarius** [X]
- A. Lvs linear to lanceolate or oblong, acute; calyx urn-shaped; flws deep pink or purple **D. repens** [B]

Sabulina

- A. Infl at least some stems with >1 flws ^{25.70}
 - B. Sepals stipitate-glandular ^{25.70}; mature capsules 4.5–5 mm long ^{25.70} **S. rubella** [B]*
 - B. Sepals glabrous; mature capsules 2.5–4.5 mm long ^{25.70}
 - C. Sepals broadly elliptic to ovate ^{25.70}; infl 1–5 flwed ^{25.70}; lvs generally not overlapping ^{25.70}; capsule equal to or shorter than sepals ^{25.70} **S. stricta** [B]*
 - C. Sepals ovate to broadly lanceolate ^{25.70}; infl 7–15 flwed ^{25.70}; lvs overlapping and crowded ^{25.70}; capsule longer than sepals ^{25.70} **S. dawsonensis** [M]*
- A. Infl with only 1 flw, terminal ^{25.70}
 - D. Plant densely pulvinate to tufted; sepals 1.5–2.5 mm long, 1-veined and keeled **S. rossii** [B]*
 - D. Plant loosely tufted; sepals 1.5–4 mm long, 1–3-veined ^{25.70}
 - E. Sepals elliptic to ovate, acute to acuminate ^{25.70}, apex green or purple **S. stricta** [B]*
 - E. Sepals ovate to lanceolate, apex rounded to acute, apex often purple ^{25.70} **S. elegans** [B]*

Sagina

- A. Plant caespitose, forming low cushions; cauline lvs subulate; sepal margins purple **S. nivalis** [B]
- A. Plant tufted, with ascending branches or procumbent in some; cauline lvs linear or sometimes linear-subulate; sepal margins white or rarely purple **S. saginoides** [B]

Silene

- A. Plant densely pulvinate, <6 cm tall ³⁴; flws solitary, pink to purplish **S. acaulis** [B]
- A. Plant not densely pulvinate, >10 cm tall; flws solitary or with multiple occurrences per stem, usually white, sometimes pink or purple
 - B. Plant glabrous and glaucous **S. vulgaris** [X]
 - B. Plant variously pubescent
 - C. Flws nodding during anthesis; petals pink, purplish, or red; petals equal or shorter than calyx ^{25.60} **S. uralensis**
 - D. Infl with single flw per stem **ssp. uralensis** [B]

- D. Infl with at least some pedicels with ≥ 2 flws per stem **ssp. ogilviensis** [B]
- C. Flws upright; petals white or pink, longer than calyx
 - E. Petals usually reddish ^{25.60} **S. chalconica** [X]+
 - E. Petals white or pink
 - F. Flws (female) with <5 styles
 - G. Calyx purple or white with purple veins ^{25.60} **S. repens** [B]
 - G. Calyx green or pinkish ²⁰
 - H. Plant with only perfect flws ^{25.60}; flws nocturnal ^{25.60} **S. noctiflora** [X]
 - H. Plant with at least some staminate and pistillate flws ^{25.60}
 - I. Calyx urceolate-cylindrical, about 12 mm long **S. williamsii** [B]
 - I. Calyx campanulate, 5–7 mm long **S. menziesii** [X]
 - F. Flws with 5 styles
 - J. Calyx with purple-septate hairs, often as vertical bands along veins; plants typically <30 cm tall
 - K. Infl cymose ^{25.60}; flws small 1–8 flwed cluster per stem ¹⁷ **S. ostenfeldii** [B]*
 - K. Infl typically 1–3 flwed per stem ^{25.60}
 - L. Flw petals >1.25.60 times longer than calyx ^{25.60}
 - M. Flw petals white or pink ^{25.60}; plant 2–12 cm tall ^{25.60}; leaf blades ≤ 25.60 mm long ^{25.60}; **S. hitchguirei** [M]+
 - M. Flw petals dingy purplish red ⁴⁰; plant 15–35 cm tall ^{25.60}; leaf blades 15–60 mm long ^{25.60} **S. soczavana** [B]+
 - L. Flw petals about half as long as calyx ^{25.60} **S. involucreta**
 - N. Stem sturdy, usually <20 cm tall ^{25.60}; leaf internodes equaling or shorter than leaf length ^{25.60} **ssp. involucrata** [B]
 - N. Stem slender usually >30 cm tall ^{25.60}; leaf internodes longer than leaf length ^{25.60} **ssp. tenella** [B]
 - J. Calyx lacking dense occurrences of purple septate hairs; plants to 100 cm tall
 - O. Stem hispid ^{25.60} **S. chalconica** [X]
 - O. Stem glandular-pubescent,
 - P. Flws perfect; plant 20–40 cm tall; limb of petal shorter than calyx ^{25.60}; calyx 10-veined ^{25.60}; flws 10–12 mm diameter ^{25.60} **S. ostenfeldii** [B]
 - P. Flw unisexual ^{25.60}; plant to 100 cm tall ^{25.60}; limb of petal twice as long as calyx ^{25.60}; calyx 20-veined in staminate flws, 10-veined in pistillate flws ^{25.60}; flws 10–24 mm diameter ^{25.60} **S. latifolia** [M]+

Stellaria

- A. Plants densely pulvinate, with a central taproot; perennial **S. dicranoides** [B]
- A. Plants upright or matted, rhizomatous, if taprooted not a perennial
 - B. Lower lvs long-petioled; stem pubescent with multicellular hairs in longitudinal lines **S. media** [B]
 - B. All lvs sessile; stem usually glabrous, if pubescent not in longitudinal lines
 - C. Lvs firm, keeled, green and often glaucous; sepals 3-veined, with prominent midvein ^{25.61}; petals equaling to 50% longer than sepals ^{25.61} **S. longipes ssp. longipes** [B]
 - C. Lvs soft, not prominently keeled, fresh green; sepal midvein not prominent; petals absent, shorter to somewhat longer than sepal
 - D. Flws in axils of small scarious bracts or scarious-margined lvs
 - E. Flws subumbellate **S. umbellata** [B]
 - E. Flws not subumbellate
 - F. Flws solitary or sometimes 2; lvs lanceolate to elliptic, entire **S. alaskana** [B]
 - F. Flws in open cyme, lvs linear to elliptic, finely serrulate. **S. longifolia** [B]
 - D. Flws in axils of green lvs, or if infl cymose, with leafy bracts
 - G. Plant with matted habit; lvs somewhat fleshy, widest towards middle
 - H. Lvs oval-elliptic, succulent ^{25.61}; petal equaling sepal lengths ^{25.61}; seeds smooth ¹⁷ to slightly rugose ^{25.61}; sepals 1–3 veined ^{25.61}; brackish seashore plant ... **S. humifusa** [B]
 - H. Lvs linear to oblong, thin; petals equal or longer than sepals ^{25.61,34}; seeds rugose ^{25.61}; sepals 3-veined; meadow plants **S. crassifolia** [B]
 - G. Plants not matted; lvs not fleshy, usually widest towards base
 - I. Lvs lanceolate to linear-lanceolate, occasionally ovate-lanceolate to elliptic, <60 mm long; thick, veins other than midvein usually not visible; stems usually more or less papillate; sepals in open flws 2–5 mm long with 1–3 prominent veins ^{25.61} **S. borealis ssp. borealis** [M]
 - I. Lvs ovate, ovate-lanceolate to elliptic, mostly <25 mm long,

thin, reticulate-veined; stems never papillate; sepals in open
flws <2.5 mm long with obscure veins ^{25,61} ***S. calycantha*** [B]

CELASTRACEAE

Parnassia

- A. Petals fimbriate along sides ***P. fimbriata*** [M]
- A. Petals entire
 - B. Petals length equal to or shorted than sepals, 3–5 veined ***P. kotzebuei*** [B]
 - B. Petals nearly twice as long as sepals, 5–9 veined ***P. palustris*** [B]

CORNACEAE

Cornus

- A. Plant woody with open cymes of small white flws; large petal-like bracts lacking
 - B. Leaf abaxial blade surface with appressed hairs, except near secondary veins ^{25,68};
styles 1–2 mm long ²⁸ ***Cornus sericea*** [M]*
 - B. Leaf abaxial blade surface with erect hairs ^{25,68}; styles 2–3 mm long ²⁸ ***C. occidentalis*** [M]+
- A. Plant herbaceous; flws subtended by 4 petal-like bracts surrounding tight cluster of small flws
 - C. Flw petals cream or yellowish green; sepals whitish ***C. canadensis*** [B]
 - C. Flw petals cream or yellowish green and purple; sepals purple or cream with
purple mottling ^{25,68} or veins ***C. unalaschkensis*** [B]

CRASSULACEAE

- A. Stamens as many as sepals, petals, and carpels; wet sites ²⁹ ***Crassula aquatica*** [B]+
- A. Stamens twice as many as sepals; upland sites, often rocky ²⁹
 - B. Flws dioecious, 4-parted ***Rhodiola integrifolia* ssp. *integrifolia*** [B]*
 - B. Flws perfect, 5-parted ***Sedum***
 - C. Cauline lvs mostly opposite, broadly oval to orbicular ³⁴ ***S. divergens*** [M]+
 - C. Cauline lvs alternative, linear to linear-lanceolate ³⁴ ***S. lanceolatum* var. *lanceolatum*** [M]

CUPRESSACEAE

Juniperus

- A. Lvs scale-like, decurrent on stem ***J. horizontalis*** [M]
- A. Lvs awl-shaped, jointed to stem, often in whorls of 3 ***J. communis***
 - B. Lvs straight to slightly curved, very concave in cross-section, blades angled 20–45°
from stem, stomatal band 1–1.5 times as wide as green margin; mature seed cones
much shorter than lvs ⁴ **var. *depressa*** [M]
 - B. Lvs curved, somewhat concave in cross-section, blades angled 30–80° from stem,
stomatal band 1.5–2 times as wide as green margin; mature seed cone about as
long as lvs ⁴ **var. *kelleyii*** [M]+

CYPERACEAE

- A. Flws unisexual (at least in part), the staminate and pistillate flws on same or different spikes ²⁹
and achene enclosed in perigynium or spathe ²⁹; flw perianth bristles absent ^{25,14} ***Carex***
- A. Flws mostly perfect, but achene not enclosed in sac or spathe ²⁹; flw perianth usually with bristles ^{25,14}
 - B. Bristles numerous and much elongated in fruit, silky ***Eriophorum***
 - B. Bristles short (e.g., <10 mm), inconspicuous or absent
 - C. Base of style enlarged, bulbiform, separated from achene summit ***Eleocharis***
 - C. Base of style not distinctly enlarged, continuous with achene
 - D. Infl umbelliform
 - E. Involucral bracts 1, erect, appears a continuation of culm ^{17,28} ***Schoenoplectus***
 - E. Involucral bracts 2–5 ²⁹, leaf-like ***Scirpus microcarpus*** [B]
 - D. Infl spike-like or glomerate head ⁴²:
 - F. Infl a dense glomerate head ⁴²; bracts 1–2, several times longer
than spike ²⁹ ***Bolboschoenus maritimus* ssp. *paludosus*** [M]+
 - F. Infl spike-like and involucral bracts short
 - G. Spike solitary, apical ⁴², about 7 mm long ⁴⁷, several or more
bristles present ***Trichophorum***
 - G. Spikes composed of several overlapping spikelets in 2 vertical rows,
to about 20 mm long ⁴⁷, infl bristles not apparent ***Blysmopsis rufa*** [B]+

Carex (Note: *C. × flavicans*, *C. × helvola*, and *C. × physocaroides* not included due to lack of descriptions)

- A. Infl a solitary spike, terminal **GROUP 1**
- A. Infl composed of >1 spike
 - B. Terminal spikes bisexual and sessile; spikes sessile or short pedicellate; stigmas usually 2 **GROUP 2**
 - B. Terminal spikes unisexual and usually staminate, less often with pistillate flws at base, or with pistillate flws at summit; spikes either long or short pedicellate; stigmas 2 or 3
 - C. Stigmas 2 **GROUP 3**
 - C. Stigmas 3
 - D. Terminal spike staminate distally **GROUP 4**
 - D. Terminal spike pistillate distally **GROUP 5**

GROUP 1 (Single spike)

- A. Staminate and pistillate flws on different plants
 - B. Stigmas 2; perigynium smooth; spike scales brownish with hyaline margin; lvs filiform . . *C. gynocrates* [B]
 - B. Stigmas 3; perigynium pubescent;; spike scales blackish, ciliate and puberulent; lvs flat, 3–4 mm wide *C. scirpoidea* [B]
 - C. Perigynium compressed-triangular in cross-section, ovoid or oblong-ovoid, <3 mm long; achene very short stipitate ⁴⁷ *ssp. scirpoidea* [B]
 - C. Perigynium plano-convex in cross-section, broadly lanceolate, <4 mm long; achene distinctly stipitate ⁴⁷ *ssp. stenochlaena* [M]+
- A. Staminate and pistillate flws on same spike
 - D. Stigma 2
 - E. Plant rhizomatous, thread-like ^{25,14}; culms filiform ⁴² *C. gynocrates* [B]
 - E. Plant caespitose or, if present, rhizome coarser and shorter
 - F. Spike gynacandrous (pistillate flws at summit) *C. ursina* [B]
 - F. Spike androgynous (staminate flws at summit)
 - G. Perigynium margins serrulate distally ^{25,14}
 - H. Perigynium tapering into base ²⁸; plant densely tufted, without rhizomes, phyllopodic ²⁸ *C. nardina* [B]
 - H. Perigynium rounded at base ²⁸; plant loosely tufted crowded on short rhizomes, aphyllapodic ²⁸ *C. capitata* [B]
 - G. Perigynium margins smooth distally ^{25,14,47}
 - I. Spike 4–10 mm long, globular at maturity; perigynium sessile ²⁰; plant loosely tufted with short rhizomes between individual stems ²⁸ *C. capitata* [B]
 - I. Spike 10–20 mm long, linear-oblong; perigynium stipitate ²⁰; plant densely tufted with fibrous roots ²⁰ *C. micropoda* [B]*
 - D. Stigma 3
 - J. Achene enclosed in a spathe that is open on one side
 - K. Perigynium 3.5–5.5 mm long ^{25,14}; scales 3.5–5 mm long, midvein fading toward tip ^{25,14} *C. borealipolaris* [B]*
 - K. Perigynium 2–3.5 mm long ^{25,14}; scales 2–3.5 mm long, midvein distinct almost to tip ^{25,14}
 - L. Infl linear, typically 2–2.5 mm diameter; leaf blades filiform, to 0.5 mm wide, basal sheaths bladeless ^{25,14} *C. myosuroides* [B]*
 - L. Infl ovate to oblong-ovate, typically 3–8 mm diameter ^{25,14}; leaf blades to 2 mm wide, basal sheaths with persistent blades ^{25,14} *C. simpliciuscula* [B]*
 - J. Achene completely enclosed in perigynium ²⁹ used below, except where indicated
 - M. Perigynia ovate-elliptic, with short beak or beakless
 - N. Perigynia beakless, conspicuously veined ¹⁷ *C. leptalea* [M]
 - N. Perigynia usually beaked
 - O. Lvs filiform; plant tufted with fibrous roots; pistillate scales with conspicuously broad hyaline margins ¹⁷ *C. filifolia* var. *filifolia* [M]
 - O. Lvs folded, channeled, or flat ²⁰; plant with rhizome ²⁰; pistillate scales lacking conspicuously broad hyaline margin
 - P. Perigynia yellow to brown, body with many fine veins, margin broad hyaline ²⁰ *C. rupestris* [B]+
 - P. Perigynia dark brown, veinless, margins not hyaline ²⁰
 - Q. Beak >2 mm long ^{25,14}; perigynium veinless ²⁰; scale much shorter than perigynium ^{25,14} *C. nigricans* [M]+
 - Q. Beak <1 mm long ²⁰; perigynium with obscure to conspicuous veins ²⁰; scales about as long as perigynium ²⁰ *C. obtusata* [B]

- M. Perigynia lanceolate to narrow elliptic, with distinct beak
- R. Perigynia reflexed; pistillate scales early deciduous ^{20, 25.14}
 - S. Perigynia 6–7 mm long; culm triangular in cross section, curved at base; leaf ligule about as wide as long ^{25.14} *C. pauciflora* [B]+
 - S. Perigynia mostly shorter; culm circular in cross section, straight at base; leaf ligule much wider than long ^{25.14} *C. microglochin* ssp. *microglochin* [B]
- R. Perigynia not reflected; pistillate scale not early deciduous ¹⁷
 - T. Plant tufted or with short rhizomes; lvs canaliculated, thin, curved, withering early at apex *C. circinata* [M]
 - T. Plant with long, creeping rhizome; lvs flat
 - U. Pistillate scales light brown with pale midvein ²⁰, scales equal to or shorter than perigynium ^{25.14}; perigynium with numerous veins ²⁰ *C. anthoxantha* [B]
 - U. Pistillate scales dark-brown ²⁰, scales about as long as or longer than perigynium ^{25.14}; perigynium veinless ²⁰ *C. nigricans* [M]+

GROUP 2 (All spikes bisexual, stigma mostly 2)

- A. Spikes androgynous
 - B. Infl moniliform *C. disperma* [M]
 - B. Infl not moniliform
 - C. Plant tufted, rhizome short if present
 - D. Perigynia light green with white-dots ²⁰, often densely packed *C. canescens* ssp. *canescens* [B]
 - D. Perigynia body yellowish to brown ²⁰, not densely packed
 - E. Leaf sheaths brown or copper-colored adaxially ^{25.14}; heads distinctly interrupted below ^{25.14} *C. prairea* [M]
 - E. Leaf sheaths not brown or copper-colored adaxially; heads not distinctly interrupted below ^{25.14}
 - F. Leaf sheaths conspicuously red-dotted adaxially ²⁰; head cylindrical ⁴², 20–60 mm long ^{25.14}, individual spikes apparent ²⁸ *C. diandra* [B]
 - F. Leaf sheath not conspicuously red-dotted adaxially; head dense, 10–20 mm long ³⁴, individual spikes difficult to distinguish ^{25.14} *C. hoodii* [M]+
 - C. Rhizome long, creeping
 - G. Perigynium wing-margined ¹⁷, margin translucent ²⁰; bog plant *C. chordorrhiza* [B]
 - G. Perigynium not winged; plants of various habits except bogs
 - H. Spikes dense hemispheric head ^{25.14}
 - I. Perigynium inflated, ovate-elliptic or ovate ¹⁷, veinless adaxially ^{25.14} *C. maritima* [B]
 - I. Perigynium not or little inflated ^{25.14}, oblong-oblancoelate ⁴⁷; finely but conspicuously veined ⁴⁷ *C. incurviformis* [M]+
 - H. Spikes linear-oblong or ovoid ^{25.14}
 - J. Culms triangular, sharp edged, scabrous; infl elongate, typically 20–25.14 mm long; plant 25.14–50 cm tall *C. praegracilis* [M]
 - J. Culms blunt triangular ^{25.14} to terete, smooth; spikes ovoid, 10–15 mm long; plant 5–20 cm tall *C. duriuscula* [B]*
 - A. Spikes gynaeandrous
 - K. Proximal bract leaf-like, exceeding infl several times; spikes essentially sessile and closely clustered apically *C. sychnocephala* [M]
 - K. Proximal bracts much shorter, not exceeding infl by several times; spikes not sessile and closely clustered apically
 - L. Margins of perigynium more or less winged
 - M. Spikes forming a dense, triangular-ovoid shaped head, usually as wide as long
 - N. Pistillate scale generally covering perigynium beak ^{17, 25.14}; plant typically 15–20 cm tall *C. phaeocephala* [M]
 - N. Pistillate scale not covering perigynium beak ²⁰; plant taller ^{17, 20}
 - O. Perigynium mostly lighter colored than pistillate scale body ^{25.14}; perigynium green to yellowish, sometimes turning brown with age ^{25.14}
 - P. Proximal bracts usually aristate ^{25.14}; spikes in head usually individually distinct ^{25.14}; perigynium white margin 0.1–0.2 to 0.5 mm wide ^{25.14} *C. preslii* [M]+
 - P. Proximal bracts scale- or leaf-like ^{25.14}; spikes in head not individually distinct ^{25.14}; perigynium white margin absent to 0.1 mm wide ^{25.14} *C. microptera* [M]
 - O. Perigynium and pistillate scale body similar in color ^{25.14}; perigynium usually dark gold to coppery brown, or brown when mature ^{25.14}; proximal bract scale-

- or bristle-like
- Q. Pistillate scales with broad (<0.25 mm wide ^{25.14}) white-hyaline margins ²⁰; perigynium wings copper-colored, darker than body ²⁰; scale margins and perigynium tips and dorsal suture margins white-hyaline **C. macloviana** [B]
- Q. Pistillate scales with narrow (<0.15 mm wide ²⁰), translucent margins or dark throughout ²⁰; perigynium wings same color as body ²⁰; scale margins and perigynium tips and dorsal suture margins not white-hyaline **C. pachystachya** [B]
- M. Spikes not forming a compact dense head or infl longer than wide
- R. Pistillate scale length, excluding awn, distinctly shorter than perigynium ^{25.14}
 - S. Perigynium with flat margins <0.2 mm wide ^{25.14}, whitish, gold, light brown, narrow lanceolate to narrow ovate ^{25.14} **C. crawfordii** [M]
 - S. Perigynium with flat margins, 0.2–0.5 mm wide, light to dark reddish brown, ovate–elliptic ^{25.14} **C. bebbii** [M]+
- R. Pistillate scales nearly as long or longer than mature perigynium ^{25.14}
 - T. Perigynium beak cylindrical, not margined, entire ^{25.14}
 - U. Perigynium 3.7–6 mm long ^{25.14}; pistillate scales yellowish brown with lighter center ²⁰; spikes slightly overlapping, moniliform, head flexuous . **C. praticola** [M]
 - U. Perigynium 6–8 mm long ^{25.14}; pistillate scales brownish with green to gold center ²⁰; spikes distinctly overlapping, forming erect head **C. petasata** [M]
 - T. Perigynium beak flat, white margined, ciliate–serrulate
 - V. Perigynium <5 mm long ^{25.14} **C. foenea** [M]
 - V. Perigynium 6–8 mm long ^{25.14} **C. petasata** [M]
- L. Margins of perigynium not winged ^{25.14}
 - W. Perigynium beak usually >0.4 mm long ^{25.14}
 - X. Infl with 5–15 spikes ^{25.14}, spikes usually contiguous, forming dense oblong head **C. arcta** [M]
 - X. Infl with 2–7 spikes ^{25.14}, spikes discontinuous, lower sometimes remote
 - Y. Perigynium green or pale brown ^{25.14}; lvs 2–5 mm wide, several lvs per stem ²⁰ **C. deweyana** var. **deweyana** [M]
 - Y. Perigynium reddish brown to dark brown ^{25.14}; lvs 1–3 mm wide, about 3 per stem ²⁰ **C. interior** [M]
 - W. Perigynium beakless or with short (usually <0.4 mm)
 - Z. Plant loosely tufted, with long rhizomes
 - a. Pistillate scales distinctly shorter than perigynium height **C. loliacea** [B]
 - a. Pistillate scales approximating perigynium height ^{25.14, 47}
 - b. Spikes not all aggregated at top of culm; pistillate scales reddish brown with lighter center ^{25.14} **C. mackenziei** [B]+
 - b. Spikes aggregated at top of culm; pistillate scales light green with green midvein area ²⁰ **C. tenuiflora** [B]
 - Z. Plant tufted, lacking long rhizomes
 - c. Spikes 2–6, more or less congested, relatively contiguous
 - d. Perigynium lanceolate ¹⁷; pistillate scales reddish-brown with pale center, lacking broad hyaline margins ^{25.14} **C. lachenalii** [B]
 - d. Perigynium elliptic–obovate to lanceolate ^{25.14}; pistillate scales pale to reddish brown with yellowish brown or lighter colored center and broad hyaline margins ^{25.14}
 - e. Culms erect ^{25.14}, very scabrous above; perigynium greenish white proximally and pale brown distally, often with medium brownish when mature ^{25.14} **C. heleonastes** [B]
 - e. Culms curved, smooth ^{25.14}; perigynium not greenish white proximally ^{25.14}; proximal bract sheath with dark auricles at mouth ^{17,20}
 - f. Plant loosely tufted ²⁰; perigynium pale brown, often gray-brown at maturity, not densely papillose ^{25.14} **C. glareosa** ssp. **glareosa** [M]
 - f. Plant densely tufted ^{25.14}; perigynium dull green to bluish-white, densely papillose ^{25.14} **C. bicolor** [B]
 - c. Spikes 3–10, lowest somewhat remote
 - g. Beak of perigynium smooth; perigynium about ≤2 mm long ^{25.14}; pistillate scales not green ^{25.14}
 - h. Pistillate scales almost as long as perigynium ^{25.14}; perigynium grayish green, becoming pale brown with age ^{25.14} **C. lapponica** [B]
 - h. Pistillate scales much shorter than perigynium ^{25.14}; perigynium pale

- brown to brown *C. bonanzensis* [B]
- g. Beak of perigynium scabrous on margins; perigynium 2–3 mm long ^{25.14};
pistillate scales green, 3-veined center, brownish with age ^{25.14}
i. Perigynium appressed-ascending to loosely spreading ^{25.14}; spikes typically
with 5–10 perigynia ^{25.14}; lvs not glaucous *C. brunnescens* ssp. *brunnescens* [B]
i. Perigynium appressed-ascending; spikes typically with 10–20
perigynia ^{25.14}; lvs glaucous *C. canescens* ssp. *canescens* [B]
- GROUP 3** (Spikes mostly unisexual, 2-stigma (or mostly 2-stigma for *C. saxatilis*)
- A. Terminal spike usually staminate or androgynous
- B. Perigynium membranous, more or less inflated, shiny ^{24.14}; proximal spikes on capillary
peduncles that often droop *C. saxatilis* [B]
- B. Perigynium not membranous, nor inflated or shiny; proximal spikes usually not on
drooping peduncles ^{20, 25.14}
- C. Proximal bract with 2–10 mm long sheath ^{25.14}
D. Lower bract longer than infl ^{25.14}; perigynium orangish, ovate to circular ^{25.14}; infl often
located among lvs when mature ³³; culms leafy near base ³³ *C. aurea* [M]
D. Lower bract shorter than infl ²⁰; perigynium green or greenish brown, lanceolate to
ovate ²⁰; lvs mostly basal *C. capillaris*
E. Plant 20–60 cm tall ³⁴; lvs flat ³⁴, to 3 mm wide ¹⁷; perigynium
2.5–4 mm long ³⁴ ssp. *elongata* [M]+
E. Plants 5–25.14 cm tall ⁵; lvs flat, folded, or channeled, <2 mm wide ⁵;
perigynium 2.5–3 mm long ⁵ ssp. *fuscidula* [B]
- C. Proximal bract sheathless or short-sheathed ²⁰
- F. Proximal bract absent or shorter than infl
- G. Pistillate scales reddish brown with green center and hyaline margins ^{25.14} *C. siccata* [M]+
G. Pistillate scales not reddish brown with green center and hyaline margins
- H. Pistillate scales yellowish to pale brown ^{25.14} *C. sartwellii* [M]+
H. Pistillate scale dark-colored
I. Culms glabrous ^{25.14}; pistillate scales purplish brown ^{25.14}; perigynium
pale brown with reddish brown spotted apically ^{25.14}; leaf
blades 3–6 mm wide ^{25.14} *C. scopulorum* var. *bracteosa* [B]+
I. Culms scabrous on angles; pistillate scales black; perigynium
green with purplish black-spotted or mottling apically ^{5, 25.14};
lvs 2 mm wide ¹⁷ *C. bigelowii* ssp. *lugens* [B]*
- F. Proximal bract nearly as long as or longer than infl
- J. Lowest stem lvs with blades
K. Perigynium ovate, veined *C. kelloggii* var. *kelloggii* [M]*
K. Perigynium round, veinless *C. aquatilis*
L. Culms to 100 cm tall ⁴²; lvs green with involute margins ⁴², about
height of infl ⁴²; staminate spikes cylindrical, 1–2 ⁴² var. *aquatilis* [M]
L. Culms 20–40 cm tall ⁴²; lvs flat, yellowish-green ⁴², shorter than
culms ⁴²; staminate spike clavate, solitary ⁴² var. *minor* [B]*
- J. Lowest stem lvs bladeless
M. Plant <15 cm tall; spikes few-flwd and <14 mm long ^{25.14, 42}; proximal bract
spathiform at base ⁴², bract equaling or longer than culm ^{17, 25.14}; cauline
lvs 1–2 mm wide; plant decumbent with curved lvs and culms ²⁹ *C. subspathacea* [B]
M. Plant usually 10–50 cm tall ^{25.14}; spikes dense and many-flwd ⁴², to 24 mm long ¹⁷;
proximal bract not spathiform at base, bract longer than culm ¹⁷;
lvs 2–4 mm wide ¹⁷; plant growing upright ⁴² *C. ramenskii* [B]
- A. Terminal spike gynaeandrous, or bisexual with pistillate flws on distal portion ^{17, 25.14}
- N. Proximal infl bract not exceeding terminal spike
O. Plant rhizomatous or stoloniferous ³⁴; pistillate scales reddish brown with
greenish midvein and hyaline margin, not concealing perigynium ^{25.14} *C. siccata* [M]+
O. Plant densely caespitose, with fibrous roots ^{25.14}; pistillate scales whitish to yellowish,
1-veined, green to gold midstrip or whitish at maturity, margins hyaline and
broad, concealing perigynium ^{25.14} *C. xerantica* [M]+
- N. Proximal infl bract exceeding terminal spike
P. Infl nearly umbelliform, with 3–5 dark spikes at top of culm *C. eleusinoides* [B]
P. Infl not umbelliform, spike not clustered at top of culm
Q. Proximal bract with open sheath-like base with dark-colored lobes ²⁰ *C. enanderi* [M]+

- Q. Proximal bract with closed short-sheathed and lacking dark-colored lobes ^{25,14}
- R. Perigynium not serrate distally, prominently veined ¹⁷; pistillate scales brown with pale midvein, margin hyaline ^{25,14}; perigynium white ^{25,14}, greenish white ⁴² or pale green ¹⁷ **C. garberi** [M]
- R. Perigynium minutely serrate below purple-tinged beak ⁴²; pistillate scales reddish brown or black ^{25,14}; perigynium green (becoming white) with reddish-brown spots ^{25,14} or black blotches ⁴² **C. rufina** [B]+

GROUP 4 (Spikes mostly unisexual, 3-stigma (mostly 3-stigma for *C. membranacea*), terminal spike staminate distally)

- A. Perigynium abaxial surface pubescent
 - B. Perigynium prominently and densely pubescent
 - C. Lvs involute or channeled proximally ^{25,14}; leaf ligule 1–3.5 mm long ^{25,14}; perigynium beak typically 0.5–1.1 mm long ^{25,14} **C. lasiocarpa** [B]
 - C. Lvs flat or M-shaped in cross-section ^{25,14}; ligule 1–12 mm long ^{25,14}; perigynium beak typically 0.8–1.6 mm long ^{25,14} **C. pellita** [M]+
 - B. Perigynium sparsely, minutely, or moderately pubescent, but not densely so
 - D. Proximal bract much shorter than infl ³⁴, sheath to 10 mm long ²⁰ **C. concinna** [M]
 - D. Proximal bract equaling to longer than infl ^{25,14}, sheathless or short sheathed ²⁰
 - E. Culm shorter than to equaling leaf heights ²⁹; perigynium 3.1–4.5 mm long, with 0.9–1.7 mm long beak ^{25,14} **C. rossii** [M]
 - E. Culm usually longer than lvs ²⁹; perigynium 2.3–3.1 mm long, beak 0.4–0.8 mm long ^{25,14} **C. deflexa var. deflexa** [M]
- A. Perigynium abaxial surface not pubescent
 - F. Proximal infl bract sheath usually ≥ 9 mm long ^{2, 3, 20, 25,14}
 - G. Blades of proximal bract much longer than infl ²⁰
 - H. Lower perigynia deflexed; beak about as long as the body of perigynium, curved **C. flava** [M]
 - H. Lower perigynia not deflexed; beak distinctly shorter than body of perigynium, nearly straight **C. viridula ssp. viridula** [M]
 - G. Blades of proximal bract usually shorter than infl, sometimes equaling height
 - I. Pistillate spikes ascending
 - J. Pistillate spikes with numerous and densely packed perigynia, pedicels long and slender; pistillate scales brown to black ^{25,14} with paler midvein ²⁰ **C. petricosa var. petricosa** [B]
 - J. Pistillate spikes with few-perigynia (3–15) ^{25,14, 28}; pedicels often short and relative stout; pistillate scales pale to dark brown with purplish tinge and broad midvein ^{17, 25,14}
 - K. Spikes scattered along peduncle, pedicels short and stout; pistillate scales light brown with broad green midvein **C. vaginata** [B]
 - K. Spike pedicels sessile to long ¹⁷; pistillate scales purplish brown with pale green center and wide translucent margins ²⁰ **C. livida** [B]
 - I. Pistillate spikes nodding to pendulous, at least lower spikes
 - L. Pistillate scales black with pale midvein ^{25,14} **C. atrofusca** [B]
 - L. Pistillate scales pale to medium (reddish) brownish, sometimes with a broad paler or greenish midvein ^{20, 25,14}
 - M. Perigynium beak <0.3 mm long ^{25,14}; perigynium 1.2–1.5 mm wide ^{25,14}; pistillate scales lacking obvious hyaline margin **C. laxa** [B]
 - M. Perigynium beak 0.5–1 mm long ^{25,14}; perigynium 0.8–1.2 mm wide ^{25,14}; scales with obvious hyaline margin ¹⁷ **C. capillaris**
 - N. Plant 20–60 cm tall ³⁴; lvs flat ³⁴, to 3 mm wide ¹⁷; perigynium 2.5–4 mm long ³⁴ **ssp. elongata** [M]+
 - N. Plants 5–25 cm tall ⁵; lvs flat, folded, or channeled, <2 mm wide ⁵; perigynium 2.5–3 mm long ⁵ **ssp. fuscidula** [B]
 - F. Proximal infl bract sheath <9 mm long or absent
 - O. Perigynium beak >1 mm, teeth usually >0.4 mm long ^{25,14, 28}
 - P. Spikes subglobose ¹⁷ to elliptic ^{25,14} **C. flava** [M]
 - P. Spikes generally cylindrical ²⁰
 - Q. Leaf sheaths purplish ¹⁷, pubescent or scabrous ^{25,14}; perigynium 2–4 mm long, teeth curved ^{25,14}; ligule 6–45 mm long ^{25,14}, typically longer than wide ² **C. atherodes** [M]
 - Q. Leaf sheaths not purple, pubescent nor scabrous; perigynium longer, teeth not curved; ligule usually shorter, typically wider than long ^{25,14}

- R. Pistillate scales acute to acuminate ^{25,14} or short awned ¹⁷, distal scales often longer than perigynium ⁴⁷; proximal bract notably exceeding infl length. . . . ***C. utriculata*** [B]
 - R. Pistillate scales blunt to acute, shorter than perigynia, perigynia inflated ⁴⁷; lvs U-shaped with involute margins ^{25,14}, papillose adaxially ^{25,14}, glaucous ¹⁷; proximal bract approximating infl length ***C. rostrata*** [B]
 - O. Perigynium beak <1 mm long, with teeth <0.4 mm long
 - S. Proximal spike on capillary pedicels, usually drooping in maturity
 - T. Proximal bract sheath >5 mm long ^{5, 20, 25,14}
 - U. Pistillate scales purplish black ¹⁷ or dark brown ²⁰
 - V. Pistillate spikes ovoid ¹⁷; perigynium papillose ^{25,14} ***C. atrofusca*** [B]
 - V. Pistillate spikes oblong-oblancoaleate ¹⁷; perigynium not papillose ^{25,14} ***C. petricosa* var. *petricosa*** [B]
 - U. Pistillate scales pale brown ²⁹ ***C. capillaris***
 - W. Plant 20–60 cm tall ³⁴; lvs flat, to 3 mm wide ¹⁷ **ssp. *elongata*** [M]+
 - W. Plants 5–25 cm tall ⁵; lvs flat, folded, or channeled ⁵, <2 mm wide ⁵ **ssp. *fuscidula*** [B]
 - T. Proximal bract sheath <5 mm long ^{20,29}
 - X. Pistillate scales reddish brown ¹⁷ or dark brown ²⁰; if scales dark brown, roots yellow tomentose and proximal bract >20 mm long
 - Y. Proximal bract shorter than infl ^{25,14}; pistillate scales apically obtuse to subacute ^{25,14}; roots with dense yellow felty ***C. limosa*** [B]
 - Y. Proximal bract equaling or exceeding infl ²⁰; pistillate scales acute to acuminate, often with awn to 3 mm long ^{25,14}; roots cover with yellowish brown tomentose ***C. magellanica* ssp. *irrigua*** [B]
 - X. Pistillate scales blackish or dark brown; roots not yellow tomentose and proximal bract usually shorter ^{20, 25,14}
 - Z. Perigynium with 10–15 prominent veins ²⁰
 - a. Pistillate scales longer than perigynium ²⁰, apex acute to acuminate, mucronate to short awned (<1.5 mm long) ^{25,14}, scales tends to wrap around perigynium proximally ²⁰ ***C. pluriflora*** [M]+
 - a. Pistillate scales usually short ¹⁷, but times longer than perigynium ²⁰, apex with 2–12 mm long awn ^{25,14}, scales narrower than perigynium proximally ***C. macrochaeta*** [B]
 - Z. Perigynium veinless, fewer, or faint
 - b. Pistillate scale midvein excurrent or forming sharp tip, to 5 mm long ¹⁷; pistillate spikes at least some ascending when maturity ^{17, 20}, scales lanceolate ^{25,14} ***C. spectabilis*** [B]
 - b. Pistillate scale midvein not distinctly excurrent, acute to mucronate, or obtuse; pistillate spikes at least lateral usually pendent, scales usually ovate ^{25,14}
- ← ←
- c. Upper pistillate spikes short-peduncled, erect or ascending ^{25,14}; lvs mostly basal ***C. microchaeta*** [B]
 - d. Perigynium and beak reddish brown or purple ^{25,14}; midvein of pistillate scale dark and body of similar color, vein inconspicuous ^{25,14} **ssp. *microchaeta*** [B]
 - d. Perigynium greenish yellowish or yellowish brown, beak black ^{25,14}; midvein of pistillate scales lighter colored than body, vein conspicuous ^{25,14} **ssp. *nesophila*** [B]+
 - c. Pistillate spikes long-peduncled, pendent, or drooping when mature; lvs both basal and cauline
 - e. Perigynium beak 0.3–0.4 mm long ^{25,14}; pistillate spikes usually with >10 perigynia ***C. podocarpa*** [B]
 - e. Perigynium beak absent ^{25,14}; pistillate spikes either more or less than 10 ¹⁷
 - f. Pistillate spikes with 2–10 perigynia ***C. rariflora*** [B]
 - f. Pistillate spikes usually with >10 perigynia ***C. microchaeta*** (see “d” couplet)
 - S. Proximal spike sessile or with stout pedicels, erect or ascending in maturity
 - g. Pistillate spikes usually with few perigynia (3–15), perigynia usually not densely packed
 - h. Infl proximal bract leaf-like, >30 mm long ^{25,14}; plant typically >30 cm tall ***C. oligosperma*** [B]+
 - h. Infl proximal bract scale-like or very short, or not substantially longer than infl; plant culms <30 cm tall
 - i. Infl with distinctive linear staminate terminal spike

- j. Perigynia yellowish green to brown, 2.5–3.3 mm long ^{25,14}; pistillate scales ovate to ovate-circular 2–3.5 mm long ^{25,14} ***C. supina* ssp. *spanicarpa*** [B]
- j. Perigynia reddish black to dark brown distally, 1.5–2.5 mm long ^{25,14}; pistillate scales subcircular 1.4–2.5 mm long ^{25,14} ***C. glacialis*** [B]
- i. Infl corymbose ²⁹, lacks distinctive linear staminate terminal spike
- k. Spikes on erect long pedicels with perigynia occurring distally; perigynium beak 0.2–0.5 mm long ^{25,14} ***C. eburnea*** [M]
- k. Spikes short pedicellate with perigynia in a scorpioid cymose pattern; perigynium beak 0.5–1 mm long ^{25,14} ***C. williamsii*** [B]
- g. Pistillate spikes with more numerous perigynia, often densely packed
 - l. Proximal bract foliaceous, equaling or longer than infl, often >30 mm long ^{17, 42}
 - m. Perigynium beak absent or minute ^{25,14}; pistillate spike usually 2 ¹⁷, oblong to linear ***C. livida*** [B]
 - m. Perigynium beak 0.3–2.1 mm long ^{25,14}; pistillate spike short-cylindrical or globular ¹⁷
 - n. Pistillate spikes 3–7 ²⁰, globose to short-cylindric ^{25,14}; perigynium 1.2–1.3 mm wide ²⁰; pistillated scales brown to reddish brown ²⁰, possibly with greenish midvein and narrow translucent margins ²⁰ ***C. viridula* ssp. *viridula*** [M]
 - n. Pistillate spikes 1–3 ^{25,14}, ovate ^{25,14} or oblong ¹⁷; perigynium 1.3–2.1 mm wide ^{25,14}; pistillate scales brown or purplish black ¹⁷ ***C. rotundata*** [B]
 - l. Proximal bract approximating or shorter than infl ^{17, 25,14}
 - o. Lvs septate-nodulose ¹⁷; perigynium beak 0.2–0.8 mm long ^{25,14} ***C. membranacea*** [B]
 - o. Lvs not obviously septate-nodulose; perigynium beak <0.3 mm long ^{25,14}
 - p. Pistillate scales ovate ^{25,14}; staminate spike small, hidden between pistillate spikes; perigynium style not long-exserted ***C. holostoma*** [B]
 - p. Pistillate scales lanceolate ^{25,14}; staminate spike extending above pistillate spikes; perigynium style long-exserted ***C. stylosa*** [B]

GROUP 5 (Spikes mostly unisexual, 3-stigma, terminal spike pistillate at least distally)

- A. Proximal pistillate spikes spreading ^{25,14} or nodding on peduncles; proximal bract sheath >5 mm long ^{25,14}
 - B. Pistillate scales purplish black; perigynium papillose ^{25,14} ***C. atrofusca*** [B]
 - B. Pistillate scales light or dark brown to black ^{25,14}; perigynium not papillose, margins sometimes serrulate ^{25,14}
 - C. Lvs 2–4 mm wide ²⁰; proximal pistillate spikes 6–10 mm long, 2–3 mm wide ^{25,14}; pistillate scales brown, 1.6–2.1 mm long ^{25,14} ***C. krauseorum*** [B]+
 - C. Lvs 1.5–3.5 mm wide ^{25,14}; proximal pistillate spikes 6–21 mm long, 3–6 mm wide ^{25,14}; pistillate scales black or brown with very narrow scarious margins, >3 mm long ^{25,14} . ***C. fuliginosa*** [B]*
- A. Proximal pistillate spikes sessile or on short-peduncled, erect; proximal bract sheath typically absent or <5 mm long
 - D. Perigynium beakless to 0.3 mm long ^{25,14}; pistillate scale sometimes mucronate to short-awned ^{25,14}
 - E. Pistillate scales lanceolate, lacking broad hyaline margin ^{25,14}, scales narrower than perigynium ^{25,14}, apex acuminate, mucronate, or awned (0.5–3 mm long) ^{25,14} . . ***C. buxbaumii*** [M]
 - E. Pistillate scales ovate, sometimes with broad hyaline margin ^{25,14}
 - F. Pistillate spikes oblong or cylindric, 2–3 mm wide ^{25,14}; infl elongate; pistillate scales light to dark brown, midvein lighter colored ^{25,14}; perigynium greenish yellow or brown ^{25,14} ***C. parryana*** [M]
 - F. Pistillate spikes globose to oblong, 3–6 mm wide ^{25,14}; infl head-like; pistillate scales and midvein dark brown or black ^{25,14}; perigynium green becoming dark brown or purple-black ^{25,14} ***C. norvegica*** [B]
 - D. Perigynium beak longer ^{25,14}; pistillate scales obtuse to acuminate
 - G. Culms smooth ^{25,14}; infl of sessile to short-peduncled spikes in a dense relatively contiguous, terminal cluster ^{25,14}; perigynium 4–5 mm long ^{25,14} ***C. sabulosa*** [B]*
 - G. Culms at least minutely scabrous distally ^{25,14}; infl not in contiguous, terminal cluster, spikes occurring in close proximity, but distinctly separate; perigynium <4 mm long
 - H. Pistillate scales longer than perigynium ^{25,14}; scales light to dark brown with hyaline margins ^{25,14}; perigynium yellowish brown to chestnut ^{25,14} ***C. atratiformis*** [M]*
 - H. Pistillate scales equal to or shorter than perigynium
 - I. Perigynium widest at middle (elliptic ^{25,14}); scales black or dark brown ^{25,14}; perigynium pale green becoming golden brown ^{25,14} ***C. atosquama*** [M]
 - I. Perigynium widest below middle (ovate ^{25,14}); pistillate scales ovate or lanceolate ^{25,14}
 - J. Pistillate scales dark brown to blackish, shorter than perigynium ^{25,14}, apex

- acute to obtuse¹⁷; perigynium pale green becoming golden brown^{25.14} *C. media* [B]
 J. Pistillate scales light to dark brown, approximating length of perigynium,
 short mucronate^{25.14}; perigynium reddish dark brown^{25.14} *C. albonigra* [M]

Eleocharis

- A. Tubercles confluent with summit of achene
 B. Scales 4–12 per spikelet^{25.79}; rhizome present usually with terminal bulb^{25.79};
 achenes surface smooth, reticulate, or finely longitudinally^{25.79} *E. quinqueflora* [B]
 B. Scapes 5–500 per spikelet^{25.79}; rhizome absent or rhizome lacking terminal bulb^{25.79};
 achenes surface smooth^{25.79} *E. elliptica* [M]
 A. Tubercles not constricted at base from achene
 C. Achene lacking longitudinal ridges at 10–30 times magnification^{25.79, 47}
 D. Perianth bristles 4–8, mostly exceeding tubercle^{25.79}, to 2 times longer
 than achene^{25.79}; culms 10–50 cm tall^{25.79} *E. mamillata* ssp. *mamillata* [B]+
 D. Perianth bristles <5, rarely exceeding tubercle, sometimes rudimentary or
 absent^{25.79}; culms 30–115 cm tall^{25.79}
 E. Culm terete to slightly compressed^{25.79}; distal leaf sheath often split^{25.79};
 spikelet subproximal scales without flws^{25.79} *E. palustris* [B]
 E. Culm terete to markedly compressed to 3 times wide than thick^{25.79};
 distal leaf sheaths rarely split^{25.79}; spikelet subproximal scales with(out)
 flws^{25.79} *E. macrostachya* [M]
 C. Achene with longitudinal ridges at 10–30 times magnification^{25.79, 47}
 F. Achene with 8–20 prominent straight longitudinal ridges^{25.79}
 G. Achene with 9–13 longitudinal rows with fine horizontal ridges^{25.79};
 culms filiform, typically 3–6 cm tall *E. acicularis* [B]
 G. Achene lacking longitudinal rows and horizontal ridges^{25.79}; culms not
 filiform, typically >10 cm tall *E. elliptica* [M]+
 F. Achene with 20 or more prominent straight longitudinal ridges^{25.79}
 H. Distal leaf sheaths with distinct teeth at apex^{25.79}
 I. Spike proximal scale clasping <3/4 of culm, subproximal scales of some
 spikelets lacking flws^{25.79}; culm terete or markedly compressed with
 <25 blunt ridges^{25.79} *E. macrostachya* [M]+
 I. Spike proximal scale clasping all of culm^{25.79}; all subproximal scales
 of all spikelets with flws^{25.79}; culm terete with 8–12 blunt ridges^{25.79} *E. erythropoda* [M]+
 H. Distal leaf sheaths lacking distinct tooth at apex^{25.79}
 J. Subproximal scales of some flying spikelets empty^{25.79}; proximal scale of some
 or all spikelets usually clasping less than all of culm^{25.79} *E. macrostachya* [M]+
 J. Subproximal scales of all flying spikelets with flws^{25.79}; proximal scale
 of all spikelets clasping all of culm^{25.79}
 K. Floral scales in middle of spikelets <1.8 mm wide, 4–5 per mm long of
 rachilla^{25.79} *E. erythropoda* [M]+
 K. Floral scales in middle of spikelets 1.8–2.5 mm wide, 2–4 per mm of
 rachilla^{25.79} *E. uniglumis* [B]

Eriophorum

- A. Spikes several, drooping or clustered, subtended by 1 or 2 foliaceous bracts
 B. Lvs linear, trigonous, 1–1.5 mm broad; bract usually only 1 *E. gracile* [B]
 B. Lvs broader, flat, 1.5–8 mm wide^{25.15}, conduplicate or involute; bracts 2 or 3
 C. Midvein of scales prominent, extending to very tip *E. viridicarinatum* [M]
 C. Midvein of scales slender, not reaching tip
 D. Peduncles glabrous or scabrous on angles; culms 20–100 cm tall^{25.15} *E. angustifolium* [B]
 D. Peduncles scabrous all around; culms <30 cm tall^{25.15} *E. triste* [B]
 A. Spikes solitary, not subtended by leafy bracts
 E. Plants stoloniferous
 F. Anthers ≥1.5 mm long; fruit head oblong; fertile scales with hyaline
 margins >1 mm wide distally^{25.15} *E. russeolum* ssp. *albidum* [B]
 F. Anthers <1 mm long; fruiting heads globose; fertile scales with hyaline
 margins <1 mm wide^{25.15} *E. scheuchzeri* [B]
 E. Plant caespitose
 G. Scales pale-margined, divergent or spreading at maturity; fruiting spikes
 globose; bristles dull white; anthers 2–3 mm long. *E. vaginatum* [B]

- G. Scales monochrome, without pale margins, not spreading or reflexed at maturity; fruiting heads obovate; anthers 1–2 mm long
- H. Culms slender, often 30–60 cm tall; uppermost sheath mostly above middle of culm; anthers >1 mm long; mature bristles dull white *E. brachyantherum* [B]
- H. Culms stout and stiff, often 20–30 cm tall; uppermost sheath often below middle of culm; anthers ≤1 mm long; mature bristles with sheen, mostly pure white *E. callitrix* [B]

Schoenoplectus

- A. Culm slender, triangular, leafy near base *S. pungens* [M]*
- A. Culm stout, terete, naked ³⁴
- B. Culm soft ³⁴; infl often drooping; scales ciliate ³⁴ *S. tabernaemontani* [B]*
- B. Culm firm ³⁴; infl erect, often compact; scales lacinate-fimbriate ³⁴ *S. acutus* var. *acutus* [M]+

Trichophorum

- A. Culms soft, 3-angled, scabrous; perianth bristles elongate, white *T. alpinum* [B]*
- A. Culms wiry, terete, smooth; perianth bristles absent, not elongating, or bristles not white ^{25,34}
- B. Plants loosely caespitose, long-rhizomatous ^{25,34}; bracts to 2.5 mm long, apex mucronate ^{25,34}; perianth bristle absent ^{25,34}; anthers 0.8–1.5 mm long ^{25,34} *T. pumilum* [M]*
- B. Plants densely caespitose, not rhizomatous; bracts >3 mm long, apex awned; perianth bristles 6 ^{25,34}; anthers 1.5–2.6 mm long ^{25,34} *T. caespitosum* [B]*

CYSTOPTERIDACEAE

- A. Indusia present *Cystopteris*
- A. Indusia absent *Gymnocarpium*

Cystopteris

- A. Frond bipinnate to tripinnate *C. fragilis* [B]
- A. Fronds ternate *C. montana* [B]

Gymnocarpium

- A. Two lower primary divisions of frond (pinna) nearly as long as terminal portion; abaxial frond surface and rachis glabrous or with sparse glandular hairs ^{25,69} *G. dryopteris* [B]
- A. Two lower primary divisions of frond about half as long as distal portion
- B. Lower pinna strongly curving toward frond apex ^{25,69}; abaxial blade surface and rachis moderately to densely glandular ^{25,69} *G. continentale* [B]*
- B. Lower pinna characteristics and glandularity intermediate between *G. dryopteris* and *G. continentale* ⁴⁶ *G. × intermedium* [M]+

DROSERACEAE

- A. Lvs suborbicular to ovate, abruptly tapering into short petiole *Drosera rotundifolia* [B]
- A. Lvs linear-spatulate to narrowly cuneate-obovate, tapering into linear petiole much longer than blade *D. anglica* [B]

DRYOPTERIDACEAE

- A. Fronds not leathery; indusia reniform or with deep sinus; pinnae margins not prominently spinulose *Dryopteris*
- A. Fronds leathery; indusia round, without deep sinus; pinnae margins prominent spinulose *Polystichum*

Dryopteris

- A. Blades <30 cm long, copiously scaly on undersurface; old fronds or their bases forming a conspicuously persistent curled tuft at base of plant; indusia large, glandular *D. fragrans* [B]
- A. Blades usually >30 cm long, scales few or absent; old fronds or their bases not forming a conspicuously persistent curled tuft at base of plant; indusia large, not glandular or small
- B. Basal pinnules of lowest pinna alternate, with downward pointing pinna >2 times longer than those pointing upward ²⁰; rachis at base of lowest pinnae and veins with sparse glandular hairs ²⁰ *D. expansa* [B]
- B. Basal pinnules of lowest pinna almost opposite, with downward pointing pinna <2 times as long as those pointing upward ²⁰; rachis and pinnae veins without glandular hairs ²⁰ *D. carthusiana* [B]

Polystichum

- A. Basal pinnae as large as adjacent pair ²⁹; frond stipe long ²⁹; pinnae linear-attenuate ²⁹ *P. munitum* [M]+
A. Basal pinnae smaller than adjacent pair, with others gradually increasing in size upward;
frond stipe very short; pinnae oblong-lanceolate ²⁹ *P. lonchitis* [B]

ELAEAGNACEAE

- A. Lvs opposite, dark green adaxially, silvery green abaxially; stamens 8 *Shepherdia canadensis* [M]
A. Lvs alternate, silvery on both surfaces; stamens ≤ 4
B. Flws unisexual ³⁴; sepals 2 ³⁴; hypanthium tube shorter than ovary ³⁴ *Hippophae rhamnoides* [X]+
B. Flws bisexual or polygamous ³⁴; sepals 4; hypanthium tube much longer
than ovary ³⁴ *Elaeagnus commutata* [M]

EQUISETACEAE

- A. Stem lacking branches
B. Fertile stems green
C. Stomata in bands or scattered in grooves; stems deciduous; cones not apiculate
D. Central cavity 4/5 diameter of stem; stem 3–8 mm diameter; sheaths
with 15–20 dark brown teeth *Equisetum fluviatile* [B]
D. Central cavity ~1/6 diameter of stem; stem 1–3 mm diameter; sheaths with
10 or fewer white-margined teeth *E. palustre* [B]
C. Stomata in 2 lines in each groove; stems evergreen; cones apiculate
E. Sheaths with 3(4) teeth; stems lacking a central cavity *E. scirpoides* [B]
E. Sheaths with 4 or more teeth; stems with a central cavity
F. Teeth numerous, articulated at base *E. hyemale* ssp. *affine* [M]
F. Teeth few, not articulated at base, persistent *E. variegatum*
G. Sheath teeth straight, brown with broad white margin ⁴⁷ ssp. *variegatum* [B]
G. Sheath teeth incurved, with uniformly black or black with
narrow white margin ⁴⁷ ssp. *alaskanum* [M]
B. Fertile stems not green or becoming green only after sporulation
H. Coning stems fleshy, lacking stomata, withering after sporulation *E. arvense* [B]
H. Coning stems not fleshy, with stomata, and becoming green and
branched after sporulation
I. Sheaths chestnut brown, flaring upwards, with teeth cohering in
several broad lobes; branches usually branched twice *E. sylvaticum* [B]
I. Sheaths green, rather tight, with teeth white-margined, free or
nearly so; branches usually unbranched *E. pratense* [B]
A. Stem branched
J. Fertile and sterile stems similar, green; first internode of lower branches
(if present) equaling or mostly shorter than stem sheath; coning in summer
K. Central cavity ~1/6 diameter of stem *E. palustre* [B]
K. Central cavity more than half stem diameter
L. Central cavity 4/5 diameter of stem; sheath teeth dark-brown distinct *E. fluviatile* [B]
L. Central cavity at most 2/3 diameter of stem ⁴⁷; sheath teeth with narrowly
white-margined teeth often united in 2s or 3s ⁴⁷ *E. × litorale*+
J. Fertile and sterile stems not alike, green or white; cones forming in spring
M. Branches double-branched; stem sheath teeth papery *E. sylvaticum* [B]
M. Branches simple; stem sheath teeth stiff
N. Branches spreading with teeth of their sheaths deltoid; lowest node of
branches generally equal to or shorter stem sheath ³⁴ *E. pratense* [B]
N. Branches ascending, with teeth of their sheaths lance-attenuate;
lowest node of branch much longer than corresponding stem sheath ³⁴ *E. arvense* [B]

ERICACEAE

- A. Herbs, stem scape-like, lvs mostly basal
B. Infl single-flwd *Moneses uniflora* [B]
B. Infl racemose
C. Infl with flws on one sided *Orthilia secunda* [B]
C. Infl cylindrical in outline *Pyrola*
A. Shrub or semi-shrub; lvs generally not mostly basal
D. Ovary inferior; fruit a berry

- E. Evergreen low-growing, creeping stem; lvs tiny, <5 mm long, linear to narrowly elliptical, alternate or whorled; fruit black *Empetrum nigrum* ssp. *hermaphroditum* [B]
- E. Deciduous or evergreen shrub, stem ascending or, if creeping, stem filiform; lvs typically >5 mm long, alternate; fruit red, bluish, or purplish *Vaccinium*
- D. Ovary superior; fruit fleshy or dry
 - F. Lvs whorled, thick, 20–70 mm long *Chimaphila umbellata* ssp. *umbellata* [B]*
 - F. Lvs not whorled and >20 mm long
 - G. Lvs densely rusty-tomentose below *Rhododendron*
 - G. Lvs not rusty-tomentose below
 - H. Fruit a drupe
 - I. Lvs entire, evergreen, leathery *Arctostaphylos uva-ursi* [B]
 - I. Lvs crenate-margined, thin *Arctous*
 - H. Fruit a dry capsule
 - J. Lvs opposite
 - K. Stamens 5 *Kalmia*
 - K. Stamens 10
 - L. Corolla white; anthers awned; lvs 4-ranked *Cassiope*
 - L. Corolla pink; anthers not awned, lvs whorled *Kalmia*
 - J. Lvs alternate
 - M. Lvs linear or linear-oblongeolate, spreading like a narrow bottle-brush
 - N. Lvs <4.5 mm long; margins entire, scarious *Harrimanella stellariana* [B]
 - N. Lvs 3–10 mm long; leaf margins glandular-serrate *Phyllodoce*
 - M. Lvs broader, not spreading like a bottle-brush
 - O. Anthers awned *Andromeda polifolia* var. *polifolia* [B]
 - O. Anthers not awned
 - P. Corolla broadly cup-shaped, purple *Rhododendron*
 - P. Corolla urn-shaped, white *Chamaedaphne calyculata* [B]

Arctous

- A. Fruit black; lvs persisting for several years, surface rugulose ²⁹, blades typically <15 mm long ^{25,86}, leaf base and petiole with some coarse ciliate on margin; corolla lobes 0.5 mm long ^{25,86} *A. alpina* [B]*
- A. Fruit red; lvs soon deciduous, not or slightly rugulose ^{25,86}, blades typically 20–50 mm long, leaf base and petiole usually lacking coarse ciliate; corolla lobes 1 mm long ^{25,86} *A. rubra* [B]*

Cassiope

- A. Lvs not grooved on the back *C. mertensiana* ssp. *mertensiana* [M]
- A. Lvs deeply grooved on the back *C. tetragona*
 - B. Flw pedicels extending beyond branch tip, >10 mm long, usually >3 times leaf length ^{25,88} ssp. *tetragona* [B]
 - B. Flw pedicels not extending beyond branch tip, <8 mm long, usually <3 times leaf length ^{25,88} ssp. *saximontana* [M]

Kalmia

- A. Flws with 5 stamens; infl corymbose; peduncle 1–10 mm long ²⁰; plant prostrate to depressed; leaf blades 3–8 mm long *K. procumbens* [B]*
- A. Flws with 10 stamens; infl umbelliform; peduncle 10–40 mm long ²⁰; plant spreading to erect ^{25,59}, to 50 cm tall ²⁰; leaf blades <20 mm long ²⁰ *K. microphylla* [M]+

Phyllodoce

- A. Corolla purple; calyx dark; sepals glabrous, finely ciliate *P. empetriformis* [M]
- A. Corolla not purple; calyx greenish yellow; sepals stipitate-glandular
 - B. Corolla and calyx greenish yellow; sepals stipitate-glandular *P. glanduliflora* [M]
 - B. Corolla white or pinkish ³⁴; other characteristics intermediate between *P. empetriformis* and *P. glanduliflora* ³⁴ *P. × intermedia* [M]+

Pyrola

- A. Flw petals and anthers crimson to pale pink *P. asarifolia* [B]
- A. Flw petals white or greenish white or pinkish; anthers yellow
 - B. Style short, straight, 1–2 mm long ²⁰, included within flw; flw petals pinkish or white *P. minor* [B]
 - B. Style longer, not straight, ≥3 mm long ²⁰, exerted; flw petals greenish or creamy-white

- C. Flws small, greenish white; lvs small, rounded (≤ 30 mm long ^{25,42}); calyx lobes as long as wide ^{25,42}; petal as wide as long ² *P. chlorantha* [B]
- C. Flws large, creamy white or pinkish; lvs larger, blade 30–50 mm long; calyx lobes longer than wide ^{25,42}; petal longer than wide ^{25,42} *P. grandiflora* [B]

Rhododendron

- A. Flws dark purple *R. lapponicum* [B]
- A. Flws white
 - B. Lvs linear, acutish; pedicels usually abruptly bent below capsule; pedicels abruptly bent below capsule at fruiting time *R. tomentosum* [B]*
 - B. Lvs oblong to linear-oblong, blunt; pedicels arcuate, not abruptly bent below capsule at fruiting time *R. groenlandicum* [M]*

Vaccinium

- A. Lvs evergreen, shiny; berries red
 - B. Plant growing upright, stem not filiform; lvs 6–15 mm long, apex blunt, often red-dotted below; flws clustered *V. vitis-idaea* [B]
 - B. Plant with creeping, stem filiform; lvs elliptic ovate, 2–6 mm long, apex pointed, margins revolute; flw single or paired *V. oxycoccos* [B]+
- A. Lvs deciduous; berries blue, purplish or black
 - C. Flws on short pedicel 2–6 mm long ³⁴; calyx lobes triangular, persistent in fruit; leaf margin entire *V. uliginosum* [B]
 - C. Flws single in leaf axils; calyx lobes blunt, deciduous in fruit
 - D. Margins of lvs serrulate throughout, nearly sessile and twigs terete ³⁴ *V. cespitosum* [M]
 - D. Margins of lvs not serrulate throughout, short petioled; young twigs ridged or 4-angled
 - E. Lvs entire or serrulate only proximally; twigs ridged *V. ovalifolium* [B]
 - E. Lvs finely serrulate to tip but not completely to base; twigs 4-angled *V. membranaceum* [M]

FABACEAE

- A. Lvs with a slender terminal tendrill
 - B. Style filiform, bearded near apex *Vicia*
 - B. Style flattened, bearded down inner side *Lathyrus*
- A. Lvs lacking tendrills
 - C. Shrub; leaf-axis with bristle-like spine ³⁴ *Caragana arborescens* [X]+
 - C. Herb; leaf-axis lacking bristle-like spine
 - D. Lfts 3
 - E. Infl globose *Trifolium*
 - E. Infl spike-like or racemose
 - F. Flws in short head-like racemes; seed pods curved or spirally coiled *Medicago*
 - F. Flws in elongate raceme; seed pods ovoid *Melilotus*
 - D. Lfts >3
 - G. Legume constricted between seeds *Hedysarum*
 - G. Legume not constricted between seeds
 - H. Lvs palmately lobed *Lupinus*
 - H. Lvs pinnate
 - I. Calyx lobes subulate, much longer than tube; fruit round, stout spines on reticulations, 1-seeded *Onobrychis viciifolia* [X]
 - I. Calyx lobes shorter than tube; fruit elongated, not strongly reticulated or bearing spines, several-seeded
 - J. Lvs pinnate with 5 lfts ³⁴ *Lotus corniculatus* [X]+
 - J. Lvs pinnate with >5 lfts
 - K. Stems usually leafy; keel of corolla blunt *Astragalus*
 - K. Stems usually not leafy; keel of corolla tipped with erect point *Oxytropis*

Astragalus

- A. Stems prostrate or nearly so; calyx and seed pods with prominently dense often black strigose pubescence
 - B. Seed pods present
 - C. Seed pods ovoid to oblong-ellipsoid, 5–10 mm long; pod stipe shorter than calyx tube ³⁴. *A. bodinii* [M]
 - C. Seed pods longer; pod stipe equal or longer than calyx tube ^{20,29}
 - D. Raceme usually 9–15 flws; legumes 10–17 mm long, straight; calyx teeth

- awl-shaped, about 3 mm long ²⁰ **A. alpinus var. alpinus** [B]
- D. Raceme 1–4 flws; legumes 30–50 mm long, becoming distinctly curved at maturity; calyx teeth linear to triangular-acuminate, 1.5–2.5 mm long **A. nutzotinensis** [B]
- B. Flws present
 - E. Corolla pinkish to bluish purple, 8–11 mm long; calyx teeth awl-shaped **A. bodinii** [M]
 - E. Corolla pinkish to purplish with lighter colored bases
 - F. Corolla pale bluish violet with whitish base ²⁰, sometimes with white wings ³⁴, 9–15 mm long; calyx teeth awl-shaped ²⁰ **A. alpinus var. alpinus** [B]
 - F. Corolla purple-tipped with cream-colored base, 12–18 mm long; calyx teeth linear to triangular-acuminate **A. nutzotinensis** [B]
- A. Stems ascending or upright; calyx or seed pods with sometimes with black pubescence
 - G. Flw petals yellow or cream-colored, not purple or bluish tipped or purple keeled
 - H. Seed pods glabrous or minutely black-strigulose, membranaceous, inflated, and pendulous; infl generally not exceeding height of lvs **A. americanus** [M]
 - H. Seed pods black-hirsute, or white- and black-pilose, not membranaceous; infl generally exceeding height of lvs
 - I. Flws yellow with distinct white margins; seed pods pendulous with age; plant 10–30 cm tall **A. umbellatus** [B]
 - I. Flws whitish or yellowish white ⁴⁷; seed pods spreading to ascending ⁴⁷; plant coarse, typically <70 cm tall ²⁰ **A. cicer** [X]+
 - G. Flw petals purple, bluish, pinkish, or whitish or yellowish with a purple tip
 - J. Corolla purple, ≥10 mm long; stems decumbent to erect-ascending, typically <35 cm tall
 - K. Plants lacking malpighiaceae hairs **A. agrestis** [B]
 - K. Plants with malpighiaceae hairs **A. laxmannii**
 - L. Calyx teeth 2–4 mm long; seed pods sessile or nearly so **var. robustior** [M]*
 - L. Calyx teeth 0.4–1.5 mm long; seed pods short stipitate **var. tananaicus** [B]*
 - J. Corolla yellow, whitish, purple-tipped, or if only purple petals <8 mm long; stems erect-ascending, to a height of 70 cm
 - M. Lft tips rounded or blunt tip; seed pods sessile or nearly so
 - N. Seed pods erect, 9–15 mm long; flws petals yellow **A. williamsii** [B]
 - N. Seed pods reflexed, about 10 mm long; flws purple or purple-tipped **A. eucosmus** [B]
 - M. Lft tips usually acuminate to acute; seed pods stipitate
 - O. Plants essentially glabrous, often drying black **A. tenellus** [M]
 - O. Plant pubescent
 - P. Seed pods present
 - Q. Seed pods glabrous **A. australis var. glabriusculus** [B]
 - Q. Seed pods black- or white-strigose **A. robbinsii** [M]
 - P. Flws present
 - R. Flws petals yellowish white or pale purple; lfts silvery gray from appressed hairs **A. australis var. glabriusculus** [B]
 - R. Flws petals white with purple keel tip; lfts glabrous above and strigose below **A. robbinsii** [M]

Hedysarum

- A. Calyx teeth distinctly unequal in length ⁴⁷, lower three to 2 mm long, all shorter than calyx tube ⁴⁷ **H. americanum** [B]*
- A. Calyx teeth of similar length ³⁴, lower teeth to 6 mm ⁴⁷, usually longer than calyx tube ⁴⁷ **H. boreale ssp. mackenziei** [B]

Lathyrus

- A. Stipules as large as the lfts or larger **L. japonicus** [B]
- A. Stipules much smaller than lfts
 - B. Lfts linear to ovate; stems winged in upper part; flws purple to violet or pinkish **L. palustris** [B]
 - B. Lfts lance-ovate to broadly elliptic; stems angled; flws yellowish white **L. ochroleucus** [M]

Lupinus

- A. Lfts silky-villous on both surfaces **L. kuschei** [B]
- A. Lfts glabrous to sparsely pubescent above
 - B. Lft apex acute, narrowly oblanceolate to elliptic, glabrous above ¹⁷, stiff hairs below ²⁰; basal lvs petioles usually ≥2 times longer than diameter of leaf **L. arcticus** [M]
 - B. Lft apex blunt to rounded or mucronate, broadly oblanceolate, usually with shaggy

- hairs below ²⁰; basal leaf petioles usually about as long as diameter of leaf *L. nootkatensis*
- C. Stem hairs spreading, long and shaggy ²⁰ var. *nootkatensis* [M]
- C. Stem hairs appressed or short, soft-wavy ²⁰ var. *fruticosus* [M]

Medicago

- A. Annual; stems prostrate or decumbent; lvs typically 3–12 mm long ¹⁵; seed pods not spirally coiled ⁶¹, 1-seeded *M. lupulina* [X]
- A. Perennial; stems erect or ascending; lfts typically to 30 mm long ¹⁵; seed pods straight or curved ⁶¹, >1 seed
 - B. Flws yellow; pods somewhat curved ⁶¹ *M. sativa* ssp. *falcata* [X]*
 - B. Flws purplish or violet; pods spirally coiled
 - C. Seed pods tightly coiled >2 spirals ⁶¹; lfts ovate to obovate ⁶¹ *M. sativa* ssp. *sativa* [X]
 - C. Seed pods loosely coiled 1–1.5 spirals ⁶¹; lfts oblong-obovate to elliptic ⁶¹ ssp. *× varia* [X]+

Melilotus

- A. Corolla white *M. alba* [X]
- A. Corolla yellow *M. officinalis* [X]

Oxytropis

- A. Pods and often flws reflexed ²⁰; plant caulescent to acaulescent *O. deflexa*
 - B. Infl not elongating in fruit; legume black-hirsute; flws pink or purple ²⁹ var. *foliolosa* [M]
 - B. Infl elongating in fruit; legume gray-hirsute; flws white suffuse with pink or purple ²⁹ var. *sericea* [M]
 - A. Pods and flws spreading to erect ²⁰; plant caespitose; stems from central taproot terminating in a many-head crown
 - C. Plant more or less glandular-viscid; calyx lobes strongly glandular-verrucose *O. borealis*
 - D. Calyx lobes deltoid, 1/4 to 1/3 as long as tube ⁴² var. *hudsonica* [M]+
 - D. Calyx lobes subulate, 1/2 to 2/3 as long as tube ⁴²
 - E. Corolla sulfur yellow, drying whitish ⁴¹; calyx grayish villous, teeth 2–3 mm long ⁴¹ var. *sulphurea* [B]+
 - E. Corolla usually not yellow; calyx hirsute on back ⁴²; teeth longer
 - F. Calyx and legume sparsely yellowish-gray hirsute, more than half as long as tube ⁴² var. *viscida* [M]*
 - F. Calyx and legume densely black hirsute ⁴², calyx about half as long as tube ²⁹ var. *borealis* [B]+
 - C. Plant not glandular-viscid; calyx lobes not glandular-verrucose
 - G. Stipules chestnut brown; flws yellow *O. maydelliana* [B]
 - G. Stipules papery white or yellow; flws various colors
 - H. Lfts or at least some of them in whorls of 3–4
 - I. Plant usually copiously silky-villous throughout; flws purple; margins of stipules lacking clavate processes *O. splendens* [M]
 - I. Plant silky-pilose or glabrescent; flws color variable; margins of stipules with clavate processes *O. campestris*
 - J. Flws yellowish var. *varians* [B]
 - J. Flws purplish or pinkish
 - K. Plant to 45 cm tall ^{25.91}; flws 10–30 ^{25.91}; some lfts whorled ^{25.91} var. *davisii* [M]+
 - K. Plant to 16 cm tall ^{25.91}; flws <14 ^{25.91}; lfts not whorled ^{25.91} var. *roaldii* [B]
 - H. Lfts opposite or alternate
 - L. Lfts 1 or 3 or occasionally 5 *O. mertensiana* [B]
 - L. Lfts ≥5
- ← ←
- M. Dwarf species with loosely tufted or compact habit; flws purple
 - N. Loosely tufted
 - O. Lfts sparingly pilose on both side or glabrous above; stipules papery, glabrous on the back *O. scammaniana* [B]
 - O. Lfts glabrate above, white villous below; stipules not papery, densely pilose
 - P. Flws ≥10; plants mostly >15 cm tall; lfts often pseudo-fasciculate, numerous *O. campestris* var. *roaldii* [B]
 - P. Flws 2–8; plants mostly <15 cm tall ⁴⁷; lfts varying in disposition and number *O. arctica*
 - Q. Flws ≤8 per stalk, purple or lavender ⁶⁰; lfts opposite ¹⁷, not or seldom

- fasciculate⁶⁰ **var. arctica** [B]
 - Q. Flws 2–5 per stalk, blue; lfts whorled¹ **var. murrayi** [E]+
 - N. Plants densely caespitose or pulvinate
 - R. Seed pods short, <2 times as long as broad, glabrous to strigose; flws 1(2) per peduncle; caudex with short prostrate branches **O. huddelsonii** [B]
 - R. Seed pods elongate; usually >3 times longer than broad, pilose; flws 2–3 (rarely 1) per peduncle; caudex with erect to prostrate branches²⁰ **O. nigrescens**
 - S. Lfts covered with dense silky canescent pubescence¹², flws usually single^{42,47}; lfts 5–11¹²; arctic habitats¹² **var. uniflora** [B]+
 - S. Lfts covered with hirsute or pilose pubescence¹², flws usually paired; lfts typically 9–15¹²; high elevation and low arctic sites
 - T. Seed pods sessile **var. nigrescens** [B]
 - T. Seed pod stipe 4–5 mm long **var. lonchopoda** [B]
 - M. Plant taller, loosely caespitose; flws yellowish except **var. roaldii**
 - U. Stipules lacking clavate processes; corollas white or yellowish; flws 15–27 mm long²⁸
 - V. Corollas fading yellowish²⁸, keel not maculate^{25,91} **O. sericea var. speciosa** [M]+
 - V. Corollas fading whitish or yellowish, keel often pinkish tinged²⁸ **var. spicata** [M]
 - U. Stipules with clavate processes; corolla yellowish or purple; flws 10–17 mm long .. **O. campestris**
 - W. Flws purple **var. roaldii** [B]
 - W. Flws yellow
 - X. Lfts 9–17, scattered or opposite; calyx gray pubescent; spikes usually <10 flws **var. jordalii** [B]
 - X. Lfts 19–45, scattered, opposite or fasciculate; calyx black and white hirsute; spikes ≥10 flws **var. varians** [B]

Trifolium

- A. Flws 10–20 mm long, usually reddish; flw head subtended by 1–2 short-petioled lvs³⁴; lvs often with reddish “V” on adaxial surface¹⁵ **T. pratense** [X]
- A. Flws about 10 mm long, white or pink; flw head lacking subtending lvs³⁴; lvs lacking reddish “V” on adaxial surface
 - B. Stem creeping¹⁷, rooted at nodes³⁴; lvs often with white or pale inverted “V” on adaxial surface¹⁵ **T. repens** [X]
 - B. Stem erect-ascending¹⁷, not rooted at nodes along stem³⁴; lvs lacking with white or pale inverted “V” on adaxial surface **T. hybridum** [X]

Vicia

- A. Fully developed infl shorter than subtending lvs; flws 3–9; raceme not one-sided³⁴; lfts with prominent lateral veins abaxially **V. americana var. americana** [M]
- A. Fully developed infl longer than subtending lvs; flws numerous, strongly overlapping, raceme one-sided³⁴; lfts lacking prominently lateral veins abaxially **V. cracca** [X]

GENTIANACEAE

- A. Corolla tubular or funnelliform
 - B. Flws 20–50 mm long, blue; corolla lobe margins fringed ... **Gentianopsis detonsa ssp. yukonensis** [B]
 - B. Flws smaller, if large yellowish; corolla lobes not fringed
 - C. Corolla with folds in the sinuses **Gentiana**
 - C. Corolla without folds in the sinuses
 - D. Flws usually >1, sessile or short peduncled, with or without throat crown **Gentianella**
 - D. Flws solitary and long-pedunculate and fimbriate crown in throat **Comastoma tenellum** [B]*
- A. Corolla rotate
 - E. Rhizomatous perennial; lvs mainly basal **Swertia perennis** [M]
 - E. Annual with taproot; lvs mainly cauline **Lomatogonium rotatum**
 - F. Plant to 20 cm tall, bushy⁴³; basal lvs usually present at flwing⁴³; flws pale to medium violet-blue, rarely white⁴³ **var. rotatum** [B]
 - F. Plant tall and more spindly⁴³; basal lvs usually absent at flwing⁴³; flws white, often suffuse with pale blue abaxially along veins⁴³ **var. fontanum** [B]+

Gentiana

- A. Tiny annual or biennial; stems leafy, prostrate to ascending; flws solitary **G. prostrata** [B]
- A. Perennial; stem upright or decumbent; flws in terminal cyme
 - B. Corolla 10–20 mm long, bluish green **G. glauca** [B]

- B. Corolla 35–50 mm long, yellowish green to cream, flecked or striped with purple *G. algida* [B]

Gentianella

- A. Corolla without fimbriate crown in the throat *G. propinqua* ssp. *propinqua* [B]
 A. Corolla with fimbriate crown in the throat *G. amarella* ssp. *acuta* [B]

GERANIACEAE

- A. Annual or biennial; flw petals about as long as the sepals; petals 5–7 mm long ³⁴ *Geranium bicknellii* [M]
 A. Perennial; flw petals about twice as long as the sepals; petals >10 mm long
 B. Flw petals rose to violet ¹⁷, pilose <1/4 petal length adaxially ³⁴ *G. erianthum* [B]
 B. Flw petals white or pale violet ¹⁷, pilose >1/3 petal length adaxially ³⁴ *G. richardsonii* [M]

GROSSULARIACEAE

- A. Stems prickly or spiny
 B. Flws mostly occurring singly *Ribes oxyacanthoides* var. *oxyacanthoides* [M]
 B. Flws in racemes *R. lacustre* [M]
 A. Stems without prickles or spines
 C. Lvs glandular-dotted on lower surface *R. hudsonianum* [M]
 C. Lvs not glandular-dotted
 D. Bark exfoliating; fruit smooth and shiny *R. triste* [B]
 D. Bark not exfoliating, fruit stipitate-glandular or strigose
 E. Fruit red; sepals glabrous *R. glandulosum* [M]
 E. Fruit purplish black, sepals pubescent *R. laxiflorum* [M]

HALORAGACEAE

- A. Submerged lvs all pectinate ^{25,75}; turions present ^{25,75} *Myriophyllum verticillatum* [B]
 A. Submerged lvs pectinate proximally and pinnatifid to lobed distally ^{25,75};
 turions present or absent ^{25,75} *M. sibiricum* [B]

HYDROPHYLLACEAE

- A. Middle and upper stem lvs markedly reduced ⁴⁷; infl capitate or thyrsoid aggregates of short helicoid cymes ⁴⁷; perennial
 B. Plant velvety pubescent with spreading hairs ⁴⁷ *Phacelia mollis* [E]
 B. Plant silky pubescent with appressed hairs ⁴⁷ *P. sericea* [M]+
 A. Stem lvs relatively uniformly leafy throughout; infl helicoid cymes arranged in a more or less in a corymb ⁴⁷; annual or biennial
 C. Plant strongly viscid-glandular ⁴⁷; lvs cordate-ovate, coarsely dentate ⁴⁷ *P. campanularia* [X]+
 C. Plant nonglandular or only moderately glandular ⁴⁷; lvs pinnate or pinnatifid *P. franklinii* [M]

IRIDACEAE

- A. Flws 20–40 mm long; sepals and petals unlike; not subtended by an erect bract; lvs 5–15 mm wide *Iris setosa* [B]
 A. Flws 8–12 mm long; sepals and petals alike, subtended by an erect, long, narrow leaf-like bract approximating or exceeding flw height; lvs 1–5 mm wide *Sisyrinchium montanum* var. *montanum* [M]

ISOETACEAE

- A. Plant flaccid with plant lvs ²⁰; megaspores with long thin spines of similar length, not sharp ridged ²⁰ *Isoetes echinospora* [M]
 A. Plants and lvs rigid; megaspores spines of unequal length or surface sharp ridged ²⁰
 B. Megaspore with short thin spines, spines shorter and denser around girdle ²⁰ *I. maritima* [B]+
 B. Megaspore with rough spines or sharp confluent ridges, without shorter spines around girdle ²⁰ *I. occidentalis* [B,M]+

JUNCACEAE

- A. Capsule many-seeded; plant completely glabrous *Juncus*
 A. Capsule 3-seeded; lvs and sheaths, at least in youth, with a few soft white hairs *Luzula*

Juncus

- A. Annual; plant much-branched, often <10 cm tall *J. bufonius* [B]
- A. Perennial; plant typically not much-branched, typically >10 cm tall
 - B. Infl appearing laterally, at base of a terete bract-like appearing continuation of culm; culm leafless, but with firm persistent sheaths at base; coarse plants, mostly with stout subligneous horizontal rhizomes
 - C. Flws few, 2-5; plant densely tufted *J. drummondii* [M]
 - C. Flws several; plants with creeping rhizome
 - D. Bract slender, as long or longer than stem *J. filiformis* [B]
 - D. Bract stout, much shorter than stem
 - E. Infl dense; anthers about same length as filaments; involucre bract short (20–50 mm long ²⁹) *J. arcticus* ssp. *alaskanus* [B]+
 - E. Infl open; anthers longer than their thick short filaments ⁴⁷; involucre bract longer ⁴⁷ *J. balticus* ssp. *ater* [M]*
 - B. Infl appearing terminal, if lateral, bract flat, not a continuation of the culm; culm with well-developed green lvs from base; rhizomes not subligneous
 - F. Infl capitate (in *J. mertensianus* sometimes with several heads)
 - G. Infl many-flws, spherical, dark brown or black; lvs septate or nodulose *J. mertensianus* [M]
 - G. Infl few-flws; sepals and mature capsules pale, straw-colored or pale reddish brown
 - H. Bract leaf-like, exceeding mostly 2-flw infl; capsule retuse *J. biglumis* [B]
 - H. Bract scale-like, equaling or slightly longer than infl; capsule acuminate
 - I. Flwing stem(s) mostly solitary or a few together, filiform, 10–30 cm tall, with 1–3 lvs in lower 1/3; seeds 3 mm long *J. stygius* ssp. *americanus* [B]
 - I. Flwing stems tufted, typically <15 cm tall, rather stout; lvs all basal *J. triglumis*
 - J. Capsule longer than perianth ssp. *triglumis* [M]
 - J. Capsule about the same length as perianth ssp. *albescens* [B]
 - F. Infl compound
 - K. Lvs distinctly septate-nodulose; leaf blades terete
 - L. Stems from slender rhizome; heads 1–3, spherical, many-flws *J. nodosus* [B]
 - L. Stems tufted from stout rhizome, heads not spherical, few flws *J. alpinarticulatus* [B]
 - K. Lvs not septate-nodulose; leaf blades flat ³⁴, involute ³⁴, or canalculated
 - M. Plant tufted, rhizomes densely branched ^{25,26}; infl heads with 5–40 ^{25,26}; lvs narrow (<1 mm wide) ^{25,26, 42}
 - N. Auricles of leaf-sheaths delicate, white or scarious, to 3 mm ⁴⁷; leaf blades mostly more than half the height of the culm ⁴⁷ *J. tenuis* [B]+
 - N. Auricles of leaf-sheaths short and round ⁴⁷; leaf blades mostly less than half the height of the culm ⁴⁷ *J. dudleyi* [M]+
 - M. Plant stoloniferous ⁴²; infl heads with 4–10 flws; lvs 1–2 mm wide ³⁴ *J. castaneus*
 - O. Heads 1–3, dark, unstalked or short-stalked ²⁰; capsule not greatly surpassing the perianth ⁴⁷ ssp. *castaneus* [B]
 - O. Heads several, pale, long-stalked ²⁰; capsule about twice perianth length ⁴⁷ ssp. *leucochlamys* [B]

Luzula

- A. Flws solitary at end of ultimate branches of paniculate or umbellate somewhat drooping infl; branches capillary
- B. Infl umbellate *L. rufescens* [B]
- B. Infl a loose compound cyme
 - C. Bracts entire to slightly ciliate; bractlets entire to lacerate but never strongly ciliate; cauline lvs 3–4 or more *L. parviflora* ssp. *parviflora* [B]
 - C. Bracts and bractlets strongly long-ciliate
 - D. Lower bract 4–10 mm long; cauline lvs 2, thin, more or less shiny green; seeds dark brown *L. wahlenbergii* [B]
 - D. Lower bract 15–25 mm long; cauline lvs 3, thick, dull bluish to grayish green; seeds pale yellowish brown *L. piperi* [B]
- A. Flws crowded in few to many-flws glomerules or spikes
 - E. Basal lvs involute or channeled
 - F. Infl dense, spike-like, drooping *L. spicata* [M]
 - F. Infl often with several flw glomerules on erect or spreading stiff branches *L. confusa* [B]
 - E. Basal lvs flat
 - G. Bracts of the infl short and inconspicuous

- H. Lvs 2–3 mm wide, with thin attenuate tips; infl of several few-flwd glomerules on long drooping capillary branches; leaf sheath densely pilose ^{25,84} *L. arcuata* ssp. *unalaschkensis* [B]
- H. Lvs 3–5 mm wide, with blunt, callous tips; infl of capitate or short peduncles ²⁰; leaf sheath essentially glabrous ^{25,84}
 - I. Infl capitate *L. nivalis* [B]+
 - I. Infl of several erect-ascending stalked glomerules *L. kjellmaniana* [B]*
- G. Bracts usually conspicuous and exceeding infl, often dense and glomerate, occasionally with smaller lateral and stalked glomerules
 - J. Infl mostly sub-umbellate with 1 large and several smaller heads on stiff erect branches; perianth parts 2–3.5 mm long; seeds 1.1–1.4 mm long *L. multiflora* ssp. *frigida* [M]
 - J. Infl glomerate, often with additional pair of small short-stalked glomerates subtended by an obliquely projecting leafy bract; perianth parts 2–2.5 mm long; seeds 0.8–1.1 mm long *L. groenlandica* [B]

JUNCAGINACEAE

- A. Fruit ovate, splitting into 6 segments; plant coarse *Triglochin maritima* [B]
- A. Fruit linear-clavate, splitting into 3 segments; plant delicate *T. palustris* [B]

LAMIACEAE

- A. Flws in terminal spike or cluster, sometimes interrupted by bracts or reduced lvs
 - B. Corolla scarcely longer than calyx *Dracocephalum parviflorum* [M]
 - B. Corolla longer than calyx
 - C. Calyx 2-lipped, the upper 3-toothed ³⁴; lvs lanceolate to oblong, shallowly dentate, long-petioled ²⁹ *Prunella vulgaris* var. *lanceolata* [B]+
 - C. Calyx not 2-lipped, equally 5-toothed ³⁴; lvs oblong-ovate to lanceolate, crenate-serrate, sessile to subsessile *Stachys pilosa* var. *pilosa* [X]
- A. Flws in leaf axils
 - D. Flws occurring singly in leaf axils *Scutellaria galericulata* var. *pubescens* [M]
 - D. Flws in whorls or cluster in leaf axils
 - E. Corolla shape regular or nearly so *Mentha canadensis* [B]+
 - E. Corolla irregularly shaped
 - F. Lvs ovate to lanceolate or elliptic *Galeopsis bifida* [X]*
 - F. Lvs roundish to reniform ³⁴
 - G. Flws and upper stem lvs petiolate ³⁴ *Glechoma hederacea* [X]+
 - G. Flws and upper stem lvs sessile, clasping ³⁴ *Lamium amplexicaule* [X]+

LENTIBULARIACEAE

- A. Terrestrial; lvs in a basal rosette, entire; flws purple *Pinguicula*
- A. Aquatic; lvs dissected; flws yellow *Utricularia*

Pinguicula

- A. Scape distinctly glandular-villous; corolla <10 mm long *P. villosa* [B]
- A. Scape essentially glabrous; corolla >15 mm long *P. vulgaris*
 - B. Lower corolla lip lobes obovate-oblong, often overlapping ²⁹; spur stout, blunt ²⁹ ssp. *macroceras* [B]
 - B. Lower corolla lip lobes oblong, not overlapping ²⁹; spur small, acute ²⁹ ssp. *vulgaris* [M]

Utricularia

- A. Bladders and lvs borne on separate branches
 - B. Bladders on leafless branches ⁴⁷ *U. intermedia* [B]
 - B. Bladders on branches with small lvs that subtend pedicels ⁴⁷ *U. ochroleuca* [M]+
- A. Bladders and lvs borne on same branches
 - C. Delicate plant with stems <0.5 mm thick; bladders up to 2 mm long *U. minor* [B]
 - C. Coarse plant with stems >5 mm thick; ladders 3–5 mm long *U. vulgaris* ssp. *macrorrhiza* [B]

LILIACEAE

- A. Stem lvs whorled *Fritillaria camschatcensis* [B]
- A. Stem lvs not whorled
 - B. Flws axillary, 1 or 2 together; flws whitish green *Streptopus amplexifolius* [B]
 - B. Flws borne mostly singly, petals creamy with purple veined *Gagea serotina* var. *serotina* [B]*

LINNAEACEAE

- A. Corolla to 11 mm long, narrowly campanulate, flaring from within calyx ⁴⁷, flw tube much shorter than calyx or lacking ⁴⁷ *Linnaea borealis* ssp. *borealis* [B]
- A. Corolla <15 mm long, funnelform, flw tube slender and equaling or surpassing calyx ⁴⁷ ... ssp. *longiflora* [M]*

LYCOPODIACEAE

- A. Sporangia in axils of leaf-like sporophylls, lacking terminal strobili ²⁰ *Huperzia*
- A. Sporangia in terminal strobili
 - B. Lvs scale-like, adnated to branch at least half of length *Diphasiastrum*
 - B. Lvs linear-subulate, spreading
 - C. Aerial stems erect, branched above, tree-like *Dendrolycopodium dendroideum* [M]*
 - C. Aerial stems narrow bottle-brush shaped
 - D. Strobili sessile *Spinulum annotinum* [B]*
 - D. Strobili peduncled *Lycopodium lagopus* [B]*

Diphasiastrum

- A. Strobili peduncled *D. complanatum* [B]*
- A. Strobili sessile at end of leafy stems
 - B. Lvs adnated to stem ¹⁷, one row distinctly different ³⁴; stem flattened ²⁹, appearing winged ³⁴; plant to 9 cm tall *D. alpinum* [B]*
 - B. Lvs only partially adnated to stem ¹⁷, all similar ³⁴; stem cylindrical, not appearing winged; plant to 18 cm tall *D. sitchense* [B]*

Huperzia ⁵⁵

- A. Lvs not lustrous, green to yellowish brown; gemmae occurring near the tip of the annual shoot increment in leaf axils ⁵⁵, <3 mm long ²⁷; low to high-elevation sites ¹⁷ *H. selago* [B]*
- A. Lvs lustrous, yellowish green to orange brown ⁵⁵; gemmiphores and gemmae distributed throughout mature portion of stem ⁵⁵, >3 mm long ⁵⁵; high-elevation and high-latitude sites *H. continentalis* [B]*

MELANTHIACEAE

- A. Lvs linear <10 mm wide; plant with basal bulb, typically <60 cm tall *Anticlea elegans* [M]*
- A. Lvs broadly oval and numerous, often >5 cm wide, pleated; rhizome thick, typically >100 cm tall *Veratrum viride* var. *eschscholziaum* [M]

MONTIACEAE

- A. Plant with fibrous roots, slender rhizomes, or stolons *Montia*
- A. Plant with thickened taproots or corms
 - B. Capsules opening by 3 valves; flw petals and stamens usually 5 *Claytonia*
 - B. Capsules opening by a circumscissile lid; flw petals and stamens >5 *Lewisia pygmaea* [M]

Claytonia

- A. Infl equal to or shorter than basal lvs ²⁹ *C. megarhiza* [M]+
- A. Infl taller than basal lvs ²⁹
 - B. Plant with tuber or corm
 - C. Stem lvs orbiculate, abruptly contracted to petiole; corm spherical to elongate; flws dark purple *C. ogilviensis* [E]
 - C. Stem lvs narrowly elliptic to oblanceolate or narrowly oblong, tapering to base; corm spherical; flws white or pink *C. tuberosa* [B]
 - B. Plant without tuber; rhizomatous
 - D. Basal leaf blades narrowly oblong-spatulate to linear, with conspicuous membranous sheath at base; flws 1–2, pink, fading to white *C. scammaniana* [B]*
 - D. Basal leaf blades broadly elliptic to ovate or spatulate, tapering to petiole and not conspicuously sheathing base; flws several, pink with yellow claws *C. sarmentosa* [B]*

Montia

- A. Cauline lvs alternate, stem lvs 2–3 or more; perennial *M. bostockii* [B]
- A. Cauline lvs opposite, several pairs; annual *M. fontana* [B]

NYMPHAEACEAE

- A. Leaf blade with acute basal lobes, <6 cm from sinus to apex; rhizome short, erect-ascending; sepals green; flw petals white *Nymphaea tetragona* [B]
- A. Leaf blades with rounded basal sinus, <25 cm from sinus to apex; rhizome horizontal, long; sepals petal-like, yellow; flw petal small, scale-like purple, yellowish, or green *Nuphar*

Nuphar

- A. Petiole terete; sepals 7–12, yellow, 30–60 mm long; anthers reddish; fruit ovoid to subglobose, 40–60 mm long; petals yellowish to purple *N. polysepala* [B,M]
- A. Petiole flattened; sepals <6; inner sepals red at base inside, 20–35 mm long; anthers yellow; fruit ovoid, ~40 mm long, petals yellow or greenish *N. variegata* [B,M]

ONAGRACEAE

- A. Flw sepals and petals 2, about 1.5 mm long; stamens 2; fruit bristly, indehiscent, to 2 mm long, seeds with soft hooked hairs; lvs opposite, broad *Circaea alpina* ssp. *alpina* [B]
- A. Flw sepals and petals 4, much longer; stamens 8; fruit a long narrow and promptly dehiscent; fruit capsule elongate, containing tiny seeds bearing tuft of white silky hairs; lvs alternate or opposite, usually more than twice as long as wide
 - B. Flws mostly >20 mm in diameter; all lvs alternate; stigma distinctly 4-cleft ²⁸ *Chamaenerion*
 - B. Flws smaller, <10 mm diameter; lvs opposite or with upper alternate; stigma mostly entire ²⁸ *Epilobium*

Chamaenerion

- A. Plant erect; raceme many-flws, infl elongating *C. angustifolium* ssp. *angustifolium* [B]*
- A. Plant decumbent to ascending; infl few-flws, not notably elongate *C. latifolium* [B]*

Epilobium

- A. Stem lvs narrow, linear or lanceolate and >5 times longer than wide ²⁹, with gray and short appressed hairs at least in the infl ²⁰
 - B. Lvs with closely and evenly appressed pubescent, with minute, incurved hairs adaxially ²⁹ *E. leptophyllum* [M]+
 - B. Lvs glabrous or slightly pubescent, with pubescent on margins and veins ²⁹
 - C. Plant with basal rosette; upper lvs often alternate ²⁹ *E. davuricum* [B]
 - C. Plant with long, filiform runners at base, ending with bud ²⁹ or turion ^{25.52}; lvs all opposite ²⁹ *E. palustre* [B]
- A. Stem lvs broad, oblong or ovate and <5 times longer than wide ²⁹, plant usually glabrous to sparsely strigulose on abaxial midvein ^{25.52}, not grey and short appressed hairs ²⁰
 - D. Plant with basal rosette ^{25.52}
 - E. Leaf margins subentire to minutely denticulate, 2–5 teeth per side ^{25.52}; infl often nodding in bud ^{25.52}; stem not pubescent below leaf base *E. arcticum* [B]
 - E. Leaf margins serrate, >7 teeth per side ^{25.52}; infl usually erect in bud ^{25.52}; stem pubescent in lines downward from leaf base, often glandular ^{25.52} *E. ciliatum*
 - F. Lvs not rounded to subcordate at base ¹⁷; flw petals typically 2–6 mm long, white or sometimes pink ^{25.52} ssp. *ciliatum* [M]+
 - F. Lvs rounded to subcordate at base ¹⁷; flw petals typically 4.5–12 mm long, usually purple to pink ^{25.52} ssp. *glandulosum* [B]*
 - D. Plant lacking basal rosette ^{25.52}
 - G. Leaf margin subentire to sparsely denticulate, usually 2–6 teeth per margin ^{25.52}; fruiting capsules typically 17–42 mm long ^{25.52}
 - H. Infl nodding in bud, usually glabrous; lvs spatulate to oblong proximally, elliptic to narrowly lanceolate or sublinear distally ^{25.52} *E. anagallidifolium* [B]
 - H. Infl erect, strigulose and usually glandular-pubescent; lvs obovate proximally to ovate or elliptic distally ^{25.52} *E. clavatum* [M]
 - G. Leaf margin toothed, usually with >7 teeth per margin ^{25.52}; fruiting capsules typically 35–100 mm long ^{25.52}
 - I. Flw petals white; fruit pedicels 15–45 mm long ^{25.52}; lower lvs with winged petioles ^{25.52} *E. lactiflorum* [B]
 - I. Flw petals usually pink to rose-purple ^{25.52}; fruit pedicel 5–25.52 mm long ^{25.52}; lower lvs lacking winged petioles. *E. hornemannii*
 - J. Flying plants with several pairs of broad, withering, persistent lvs at base ²⁰; lvs coriaceous ^{25.52}, margin sharply toothed ²⁰; sepals 5–7 mm long ^{25.52}; petals 8–11 mm long ^{25.52} ssp. *behringianum* [B]+

- J. Flwing plants lacking broad withered lvs at base ²⁰; lvs not coriaceous ^{25,52}, margin entire or bluntly toothed ²⁰; sepals 2–4.5 mm long ^{25,52}; petals 3–9 mm long ^{25,52} **ssp. hornemannii** [B]

OPHIOGLOSSACEAE

- A. Trophophore (photosynthetic portions of blade) once or twice pinnate **Botrychium**
 A. Trophophore more dissected, triangular in outline, tripinnate
 B. Sterile blade attached near base of stem **Sceptridium multifidum** [B]*
 B. Sterile blade attached above middle of stem **Botrypus virginianus** [B]*

Botrychium

- A. Trophophores pinnae distinctly longer than wide, not fan- nor spatulate-shaped, often pinnatifid
 B. Trophophore triangular to somewhat ovate in outline
 C. Trophophore 1 pinnate, pinna pairs ≤ 6 , decreasing in length distally ⁵⁷; pinnae segments of blade widest distally ⁵⁷ **Botrychium alaskense** [B]+
 C. Trophophore with 3 divergent pinnae of similar length; pinnae segments of blade narrowly lanceolate ¹⁷ **B. lanceolatum ssp. lanceolatum** [B]
 B. Trophophore ovate, weakly triangular to oblong in outline
 D. Trophophore oblong with linear-spatulate pinnae that are sometimes bifid ⁵⁹; pinnae not distinctly pinnatifid **B. campestre var. lineare** [M]+
 D. Trophophore ovate to weakly triangular in outline; pinnae distinctly pinnatifid, ovate-rhombic to spatulate lobes
 E. Trophophore long stalked, as long to half long as blade ²⁰ **B. pedunculatum** [M]
 E. Trophophore sessile or very short stalked (stalk $< 1/4$ of blade length) ²⁰
 F. Basal pinnae similar in size ²⁰; trophophore bright, shiny green ²⁰ **B. pinnatum** [B]*
 F. Basal pinnae dissimilar in size ²⁰; trophophore dull, gray-green ²⁰ **B. hesperium** [M]+
 A. Trophophores pinnae generally fan- or spatulate-shaped, sometimes shallowly to deeply incised
 G. Basal pinnae narrowly fan-shaped to oblong, blades spanning $< 90^\circ$ ⁵¹
 H. Pinnae strongly ascending, margins dentate to lacerate ⁵¹ or shallowly incised ^{25,87} **B. ascendens** [M]
 H. Pinnae spreading to ascending ⁵¹, margins entire to slightly cleft ^{25,87}
 I. Trophophore stalk ≤ 1 mm long ²⁰, blades leathery ^{25,87}; pinnae ascending, basal pinna blade lacking midvein ^{25,87} **B. spathulatum** [M]
 I. Trophophore stalk to 20 mm long, blades firm to herbaceous ^{25,87}; pinnae horizontal to slightly spreading, blades with short midvein ^{25,87} **B. manganense** [M]+
 G. Basal pinnae broadly fan-shaped, with blades spanning $> 90^\circ$ ⁵¹
 J. Basal pinnae asymmetrical, proximal portion expanded relative to distal ⁵¹; mature sporophore stalk shorter than or equal to trophophore length ⁵¹; basal sporophore branches spreading and twisted ⁵¹; plant 6–12 cm tall ⁵¹ **B. tunux** [M]+
 J. Basal pinnae generally symmetrical ⁵¹, semicircular ^{25,87}; mature sporophore stalk equal to longer than the length of trophophore ⁵¹; basal sporophore branches usually ascending and straight ⁵¹; plant to 25 cm tall
 K. Pinnae strongly overlapping ⁵¹; basal pinnae spanning arc $> 180^\circ$ ⁵¹, margins of basal pinnae strongly curved towards stalk ⁵¹ **B. yaaxudakeit** [M]+
 K. Pinnae not or not strongly overlapping ⁵⁹; basal pinnae usually spanning an arc of 90 – 180° ⁵⁹; margins of basal pinnae not strongly curved towards stalk
 L. Pinna 2–5 pairs ⁵⁹, well spaced not overlapping ⁵⁹, margins mostly crenulate to dentate ^{25,87}, thin, herbaceous, shiny light yellowish green ⁵⁹; pinna broadly lanceolate to broadly trullate ⁵⁹ **B. crenulatum** [M]+
 L. Pinna 3–9 pairs ^{25,87, 59}, approximate to overlapping (except in shaded sites) ⁵⁹, margins entire to undulate ⁵⁹; dark green-green in fresh specimens ⁵⁹; pinnae usually symmetrical, fan-shaped ⁵⁹
 M. Trophophore narrowly ovate to narrowly triangular ⁵⁰; pinnae often overlapping ⁵⁰; basal pinnae usually larger than the adjacent pair and usually stalked ⁵⁰; sporophore stalk equal to shorter than fertile portion ⁵⁰ **B. lunaria** [B]
 M. Trophophore oblong to narrowly ovate ⁵⁰; pinnae remote to somewhat overlapping ⁵⁰; basal pinnae usually not longer than adjacent pair, usually not stalked ⁵⁰; sporophore stalk longer than fertile portion ⁵⁰ **B. neolunaria** [M]+

ORCHIDACEAE

- A. Plants entirely saprophytic, lacking green lvs **Corallorhiza trifida** [B]
 A. Plant with green lvs

- B. Lip inflated, pouch or boat-shaped, or saccate at least at base
 - C. Flws numerous, small and greenish white, in spike-like raceme; lvs fleshy, wintergreen, forming a rosette at base of stem *Goodyera repens* [B]
 - C. Flws 1–3, large and brightly colored, not in spike-like raceme; lvs not fleshy, not wintergreen, lacking basal rosette
 - D. Lip smooth, with margins inwardly rolled; flws 1–3; lvs 2 or more *Cypripedium*
 - D. Lip bearded; flws solitary, variegated in purple and yellow and pink; lvs solitary, at base of stem *Calypso bulbosa* var. *americana* [B]
- B. Lip not inflated or boat shaped, or saccate at base
 - E. Spur conspicuous
 - F. Flw petals white with purple spots; lvs solitary, basal *Galearis rotundifolia* [M]*
 - F. Flw petals white, or yellowish green; lvs >1, except *Platanthera obtusata*
 - G. Lip notched or 2 or 3 toothed at apex *Coeloglossum viride* [B]
 - G. Lip not notched *Platanthera*
 - E. Spur lacking
 - H. Lvs 2, opposite, about middle of stem *Neottia*
 - H. Lvs several, alternate and mostly basal
 - I. Stem arising from elongated fleshy roots *Spiranthes romanzoffiana* [M]
 - I. Stem arising from solid, tuber-like corm or bulb *Malaxis*

Cypripedium

- A. Lvs 2, subopposite on lower 1/3 of stem; flws solitary; lip white, spotted with purple; plant turns black when dried *C. guttatum* [B]
- A. Lvs 3 or more, alternate, dispersed; flws 1–3; lip white spotted or veins, or yellow; not usually turning black when dried
 - B. Sepals shorter than lip; lip 10–15 mm long, lip white *C. passerinum* [M]
 - B. Sepals longer than lip; lip usually >20 mm long; lip yellow *C. parviflorum*
 - C. Uppermost entirely tubular bract densely and conspicuously silvery pubescent¹⁸; flw pouch 20–54 mm long¹⁸; sepals unmarked to commonly marked with reddish brown or red, rarely extensively blotched¹⁸ var. *pubescens* [M]+
 - C. Uppermost entirely tubular bract glabrous or with very few hairs¹⁸; flw pouch 15–30 mm long¹⁸; sepals and petals usually suffuse with reddish brown or red blotched, or spots¹⁸
 - D. Flw sepals and petals dull greenish tan with small rust-colored spots¹⁸ var. *exiliens* [M]+
 - D. Flw sepals and petals usually suffused with dark reddish brown or red, or spotted and blotched¹⁸ var. *makasin* [M]+

Malaxis

- A. Lvs ≥2, ovate-lanceolate, alternate, to 30 mm long⁴⁷; flw lip 1.5 mm long⁴⁷ *M. paludosa* [B]
- A. Lvs usually solitary, elliptic to oval, >60 mm long⁴⁷; flw lip to 2–3 mm long⁴⁷ *M. monophyllos* var. *brachypoda* [M]+

Neottia

- A. Flws purplish, or less often yellowish green; lvs ovate-cordate or deltoid; lip deeply cleft into 2 narrow lobes *N. cordata* [B]*
- A. Flws green; lvs ovate-elliptic; lip oblong, narrowest in middle, notched at apex into 2 round lobes at apex *N. borealis* [M]*

Platanthera

- A. Stem scapose
 - B. Basal lvs 1, oblanceolate, 3–15 cm long, usually >2 times longer than broad, erect-ascending *P. obtusata* [M]
 - B. Basal lvs 2, orbicular-oval, 10–20 cm diameter, <2 times longer than broad, often flat on ground *P. orbiculata* [M]
- A. Stem leafy
 - C. Anthers appearing to lie on top of stigma^{25.77}; anther sacs widely divergent at apex, scarcely separated by obscure connective^{25.77} *P. aquilonis* [M]+
 - C. Anthers rising above stigma^{25.77}; anther sacs nearly parallel, converting, or diverging from apices separated by evident connective^{25.77}
 - D. Flws pure white *P. dilatata* [B]
 - E. Spur (2–7 mm long) shorter than lip, clavate to slightly capitate^{25.77} var. *albiflora*+

- E. Spur (4–12 mm long) nearly equaling to exceeding lip ^{25.77} **var. dilatata**+
- D. Flws greenish
 - F. Plant to 35 cm tall ^{25.77}; flw spur clavate, somewhat tapering towards obtuse apex, 4–6 mm long ^{25.77} **P. hyperborea** [M]
 - F. Plant to 100 or more cm tall ^{25.77}; flw spur slender cylindrical to clavate, usually with tapered apex, 4–12 mm long ^{25.77} **P. huronensis** [M]+

OROBANCHACEAE

- A. Plant without green foliage
 - B. Infl many-flwd, subsessile; stamens exerted; plant glabrous; plant club-like ... **Boschniakia rossica** [B]
 - B. Infl few-flws, long-pedicellate; stamens included; plants glandular-pubescent; plant stem simple or forked, slender **Aphyllon fasciculatum** [M]*
- A. Plant with green foliage
 - C. Biennial or perennial
 - D. Lvs entire or pinnatifid; upper lvs bract-like and usually highly-colored **Castilleja**
 - D. Lvs dissected or toothed; upper lvs green **Pedicularis**
 - C. Annual
 - E. Lvs palmately veined, margins distinctly toothed ³⁴ **Euphrasia**
 - E. Lvs not palmately veined, margins with(out) teeth
 - F. Calyx flattened, conspicuously inflated in fruit; lvs opposite **Rhinanthus minor** [B]
 - F. Calyx not flatted, nor in fruit; lvs alternate **Orthocarpus luteus** [M]

Castilleja

- A. Upper lip of corolla ~3 times longer than lower lip
 - B. Bracts yellow **C. unalaschcensis** [B]
 - B. Bracts red **C. miniata**
 - C. Stem glabrous or sparsely pubescent proximally and medially, eglandular distally ^{25.39}; corolla 20–48 mm long ^{25.39}; bracts central lobe typically with 3–5 small teeth at apex ^{25.39} **ssp. miniata** [M]
 - C. Stem glabrous or glabrate proximally, stipitate-glandular distally ^{25.39}; corolla 20–27 mm long ^{25.39}; bracts central lobe typically 0–7 lobed, center lobe rounded ^{25.39} **var. fulva** [M]+
- A. Upper lip of corolla >5 times longer than lower lip
 - D. Bracts violet purple to reddish or pink
 - E. Middle stem lvs lobed **C. parviflora var. parviflora** [M]
 - E. Middle stem lvs entire or occasionally with 1 lobe
 - F. Bracts loosely pubescent to long-villose; stems usually ascending **C. elegans** [B]
 - F. Bracts puberulent, or with margins hirsute; stems usually upright **C. raupii** [M]
 - D. Bracts yellowish to yellowish green
 - G. Middle stem lvs with elongate lobes; plant typically <16 cm tall **C. hyperborea** [B]
 - G. Middle stem lvs not lobed; plants typically taller
 - H. Lvs linear; lateral calyx lobes much shorter than tube **C. pallida var. yukonis** [B]*
 - H. Lvs lanceolate, attenuate-caudate to nearly linear; lateral calyx lobes as long as the tube or longer; stem **C. caudata var. caudata** [B]*

Euphrasia

- A. Flw bract teeth subulate or bristle-tipped ²⁰; flws lavender, purple striped, 5–10 mm long ²⁰ . . . **E. nemorosa** [X]+
- A. Flw bract teeth triangular or lanceolate ²⁰; flws white with purple markings, yellow eye ²⁰, 3–4 mm long **E. subarctica** [M]

Pedicularis

- A. Stems usually branched; annual or biennial or short-lived perennial
 - B. Flws purple, in short spikes or solitary in leaf axils **P. parviflora** [M]*
 - B. Flws yellow, sometimes splotted or tinged with red, in few flwd spikes **P. labradorica** [B]
- A. Stem simple; evidently perennial
 - C. Cauline lvs in whorls **P. verticillata** [B]
 - C. Cauline lvs alternate or lacking
 - D. Corolla predominantly yellow
 - E. Upper lip prolonged into distinct beak at right angle at apex; cauline lvs sessile above, blades lanceolate to linear **P. lapponica** [B]
 - E. Upper lip beakless, or nearly so; cauline or basal lvs petiolate, blades broader

- F. Infl spike-like; corolla bright yellow with tip on upper lip darker *P. oederi* [B]
- F. Infl capitate, few flws; corolla creamy-yellow ¹⁷, often tinged with red or purple *P. capitata* [B]
- D. Corolla pink or purple
- G. Upper lip of corolla upcurved, resembling an elephant head and trunk *P. groenlandica* [M]
- G. Upper lip of corolla arched or somewhat curved
- H. Upper lip pink; plant with a distinct taproot, stem abundantly leafy; infl dense and elongate, typically with numerous flws
 - I. Spike densely white-woolly; taproot bright yellow *P. lanata* [B]
 - I. Spike glabrous or nearly so; taproot not bright yellow *P. langsдорфii* ssp. *arctica* [B]
- H. Upper lip dark purple; plants with branched rhizome; stem with few and widely-spaced lvs; infl capitate but later elongating, few flwed *P. sudetica*
- J. Corolla abaxial lip not purple-spotted ^{25.72}; calyx lobes subulate ^{25.72} ssp. *interior* [B]+
- J. Corolla abaxial lip purple-spotted ^{25.72}; calyx lobes crenulated or serrulate distally
- K. Corolla galea bicolored, abaxial lip white, rarely pink ^{25.72}; calyces and bracts glabrous or white-lanate ^{25.72} ssp. *albolabiata* [B]+
- K. Corolla galea not bicolored, abaxial lip magenta ^{25.72}; calyces and bracts yellowish white-lanate, rarely glabrous ^{25.72} ssp. *arctoeuropaea* [B]+

PAPAVERACEAE

- A. Flws actinomorphic, petals separate *Oreomecon*
- A. Flws zygomorphic, petals fused *Corydalis*

Corydalis

- A. Flws blue or purple, raceme short and few-flws; perennial, from a small spherical deeply buried tuber *C. pauciflora* [B]+
- A. Flws yellow or includes yellow, in elongating racemes; annual or biennial, from a weak taproot
 - B. Stems much-branched, spreading; corolla yellow *C. aurea* ssp. *aurea* [M]
 - B. Stems simple, or branched above; erect; corolla pink with yellow tip *Capnoides sempervirens* [M]*

Oreomecon

- A. Lvs glabrous, blades 3-lobed to subentire ¹⁷ *O. walpolei* [B]*
- A. Lvs pubescent, blade with ≥5-lobed
 - B. Capsule as long as wide or nearly so; lvs glaucous *O. mcconnellii* [B]*
 - B. Capsule longer than wide; lvs green
 - C. Capsule about 20 mm long, 3 times longer than wide ⁴²
 - D. Stigmatic disc flat, rays 6–7 ⁴² *O. hultenii* [B]+
 - D. Stigmatic disc conical, rays usually 4–5, converging toward central small but prominent point ⁴² *O. keelei* [B]*
 - C. Capsule typically 10–15 mm long, <3 times longer than wide
 - E. Capsule bristles ivory-colored
 - F. Plant typically >20 cm tall ^{25.56}; lvs 200 mm long, petiole to 2/3 leaf length ^{25.56}; flws to 60 mm diameter ^{25.56} *O. nudicaulis* ssp. *americana* [B]*
 - F. Plant typically <15 cm tall ^{25.56}; lvs to 40 mm long, petiole half or less leaf length ^{25.56}; flws to 25 mm diameter ^{25.56} *O. alborosea* [B]+
- E. Capsule bristles light to dark brown or black
 - G. Scape to 50 cm ²⁹, mostly 20–30 cm tall ³⁴
 - H. Fruit capsule cylindrical, 9–12 mm long; scape <50 cm tall; flw petals yellow, red, orange, white, or pink ¹⁷ *O. croceum* [X]+
 - H. Fruit capsule pear-shaped to elliptical, <20 mm long ^{25.56}; scape >20 mm tall; flw petals yellow *O. lapponica* [B]*
 - G. Scape typically <20 cm tall ^{25.56}; capsule obovoid to subglobular ^{25.56}
 - I. Scape sparsely to densely hispid with dark brown or black trichomes ^{25.56}
 - J. Capsule about as wide as long to half longer ²⁹; lvs to 40 mm long, blades green and blue-green on both surfaces ^{25.56}; petiole half leaf length ^{25.56} *O. cornwallisensis* [B]*
 - J. Capsule 1–2.5 times longer than broad ^{25.56}; lvs to 50 mm long, light green abaxially, dark green dark green ^{25.56}; petiole half or more leaf length ^{25.56} *O. gorodkovii* [B]+

- I. Scape hispid with light- to dark brown trichomes ^{25.56}; capsules typically with light to dark brown trichomes ^{25.56}
- K. Flws <20 mm diameter ^{25.56}; lvs to 70 mm long, gray to blue green on both sides ^{25.56}; capsules ellipsoid-subglobose to oblong-obconic ***O. kluanensis*** [M]+
- K. Flws mostly >20 mm diameter ^{25.56}; lvs to 120 mm long ^{25.56}; capsules broadly obovoid to ellipsoid
 - L. Capsule trichomes generally with abruptly thickened bases ^{25.56}; petioles long-ciliate on margins, coarsely and densely hispid toward base ⁴⁷ ***O. alaskana*** [B]+
 - L. Capsule trichomes generally without thickened bases ^{25.56}; petioles short-ciliate marginally, glabrous or nearly so, on back toward base ⁴⁷ ***O. radicata*** [B]*

PINACEAE

- A. Lvs in fascicles of 2 to many
 - B. Lvs dense clusters, >3, deciduous ***Larix laricina*** [M]
 - B. Lvs 2 or 3 per fascicle, evergreen ***Pinus***
- A. Lvs evergreen, attached singly to branch
 - C. Lvs 4-angled, pointed and prickly; cones typically <60 mm long, pendent ***Picea***
 - C. Lvs flat, blunt; cones 60–100 mm long, thick, upright ***Abies***

Abies

- A. Basal bud scales equilateral triangles, margins crenate or dentate ^{25.53}; fresh leaf scars with red periderm ^{25.53} ***A. lasiocarpa*** [M]
- A. Basal bud scales apically elongate triangles, margins entire; fresh leaf scars with tan periderm ^{25.53} ***A. bifolia*** [M]+

Picea

- A. Branchlets pubescent ***P. mariana*** [M]
- A. Branchlets glabrous
 - B. Cone free-scale ≤11.4%, scale distal end flattish or indented ⁵³ ***P. glauca*** [B]
 - B. Cone free-scale >11.4%, scale distal end rounded ⁵³ ***P. albertiana***
 - C. Bark rough and scaly on lower stem, lacking resin blisters on mature trees **ssp. *albertiana* var. *albertiana*** [M]*
 - C. Bark smooth on lower stem, with resin blisters on mature trees . . . **ssp. *albertiana* var. *porsildii*** [M]*

Pinus

- A. Lower stem bark rough and scaly on mature trees; boreal areas ***P. contorta* var. *latifolia*** [M]
- A. Bark mostly smooth on mature trees; often subalpine ⁵² **var. *yukonensis*** [E]+

PLANTAGINACEAE

- A. Plant associated with perennial standing shallow water; flws <2 mm long, lacking corolla ^{25.45}
 - B. Lvs whorled; fruit drupes; ovary inferior; styles 1 ^{25.45} ***Hippuris***
 - B. Lvs opposite; fruit schizocarps; ovary superior; styles 2 ^{25.45} ***Callitriche***
- A. Plant terrestrial; flws > 2 mm long, corolla lobes present
 - C. Lvs basal; flws in continuous narrow, dense spike with obvious bracts; infl lacking showy corolla ***Plantago***
 - C. Lvs cauline and basal; flws not in continuous narrow and dense spike, infl with showy corolla
 - D. Stamens 2
 - E. Plant villous-hirsute ***Veronica***
 - E. Plant glabrous and glaucous ***Lagotis glauca* ssp. *lanceolata*** [B]+
 - D. Stamens >2
 - F. Corolla spurred, bright yellow ***Linaria***
 - F. Corolla not spurred, flws not yellow
 - G. Corolla actinomorphic; annual ***Collinsia parviflora*** [M]
 - G. Corolla zygomorphic; biennial or perennial ***Penstemon***

Callitriche

- A. Plant dark green; lvs all linear; fruit conspicuously winged ***Callitriche hermaphrodita*** [B]
- A. Plant light green; lvs both linear and oblanceolate; fruit wingless or barely wing-margined above

- B. Submerged lvs linear-oblancoolate, wider than stem *C. palustris* [B]*
- B. Submerged lvs linear, narrower than stem *C. heterophylla* [B]*

Hippuris

- A. Lvs in middle portion of emergent shoots in whorls of 7–12, tips often curled in dried specimens; filaments longer than anthers ^{25,40} *H. vulgaris* [B]
- A. Lvs in middle portion of emergent shoots in whorls of 3–7; tips not curled in dried specimens; filaments not longer than anthers ^{25,40}
 - B. Lvs in middle portion of emergent shoots linear to narrowly oblong or lanceolate, 0.5–1.5 mm wide, apices subacute ^{25,40} *H. lanceolata* [B]+
 - B. Lvs in middle portion of emergent shoots oblanceolate to oblong to broadly obovate, 2–8 mm wide, apices obtuse, rounded, or blunt ^{25,40} *H. tetraphylla* [B]

Linaria

- A. Cauline lvs linear, narrowing to a petiole-like base; flws 20–30 mm long ³⁴ *L. vulgaris* [X]
- A. Cauline lvs ovate-lanceolate, clasping at base; flws >30 mm long ³⁴ *L. dalmatica* ssp. *dalmatica* [X]+

Penstemon

- A. Upper stem villous-glandular; corolla about 20 mm long *P. gormanii* [B]
- A. Upper stem very finely pubescent to glabrous; corolla 6–10 mm long *P. procerus* var. *procerus* [M]

Plantago

- A. Lvs linear to narrowly oblong
 - B. Bracts linear, long-exserted, at least 2 times longer than flws *P. aristata* [X]
 - B. Bracts oblong to ovate, shorter than flws *P. maritima* [M]
- A. Lvs lanceolate or oval
 - C. Lvs oval, with blades abruptly tapering into a narrow petiole *P. major* [X]
 - C. Leaf blades lanceolate, gradually tapering into petiole
 - D. Plant thinly pubescent; base of lvs brownish-woolly *P. eriopoda* [M]
 - D. Plant villous; base of lvs not woolly *P. canescens* [B]

Veronica

- A. Racemes axillary
 - B. Lvs sessile, linear to lanceolate, entire *V. scutellata* [B]
 - B. Lvs petioled, lanceolate to oblong or elliptic, obscurely toothed to serrate *V. americana* [B]
- A. Racemes terminal
 - C. Annual with fine roots
 - D. Lvs linear-lanceolate; style nearly obsolete *V. peregrina* ssp. *xalapensis* [M]
 - D. Lvs ovate to elliptic; style 0.4–1 mm long *V. arvensis* [X]
 - C. Perennial with rhizomes
 - E. Leaf margin conspicuously serrate, blades typically >40 mm long and >3 times as long as broad *V. longifolia* [X]
 - E. Leaf margin entire or crenate, blades shorter and broader
 - F. Lvs sessile, oval or oblong *V. wormskjoldii* ssp. *nutans* [M]+
 - F. Lvs cordate, reniform, crenate-dentate to shallowly lobed *V. alaskensis* [B]*

POACEAE

- A. Spikelets sessile or subsessile in spike or spike-like raceme
 - B. Spikelets on opposing sides of rachis, not subcircular nor strongly laterally compressed GROUP 1
 - B. Spikelets along 1 side of rachis, distinctly lateral compressed, subcircular, imbricate in 2 rows *Beckmannia syzigachne* [B]
- A. Spikelets pedicellate forming a panicle or raceme
 - C. Spikelets 1-flwd GROUP 2
 - C. Spikelets ≥2-flwd
 - D. Spikelets with 1 terminal functional flw and 2 lateral staminate or sterile florets GROUP 3
 - D. Spikelets normally with only bisexual flws
 - E. Glumes shorter than first floret; lemmas awnless or apical awn (except *DuPontia*) GROUP 4
 - E. Glumes as long as the spikelet; lemmas (except *Sphenopholis*) with a bent awn arising from the back GROUP 5

GROUP 1

- A. Spikelets in groups of 2 or more at each node
 - B. Spikelets 1-flwd **Hordeum**
 - B. Spikelets 2–9 flwd
 - C. Lemma awnless or to 4 mm long ¹⁷ and anthers 6–8 mm long ^{25,30}; glumes lanceolate to linear-subulate ¹⁷; spikes broad relative to length; leaf blades stiff ¹⁷ **Leymus**
 - C. Lemma awns often longer or anthers ≤ 6 mm long ^{25,30}; glumes linear or lanceolate to narrowly oblong ¹⁷; spikes narrow relative to length; leaf blades soft ¹⁷ **Elymus**
- A. Spikelets borne singly at each node
 - D. First glume absent except in terminal spikelet; spikelets placed edgewise to rachis **Lolium**
 - D. Both glumes present in all spikelets; spikelets placed flat-side along rachis
 - E. Plants annual (cultivated)
 - F. Glume ovate, 3-veined **Triticum aestivum** [X]
 - F. Glumes subulate, 1-veined **Secale cereale** [X]
 - E. Plant perennial
 - G. Spikelets more or less pectinate **Agropyron**
 - G. Spikelets not pectinate **Elymus**

GROUP 2

- A. Infl cylindrical or ovoid, densely packed florets, spike-like
 - B. Glumes awnless; flw disarticulation below glume ³⁴ **Alopecurus**
 - B. Glumes awned; flw disarticulation above glumes **Phleum**
- A. Infl not densely packed spike
 - C. Infl narrow and short; glumes < 1 mm long, shorter than lemma; fruit at maturity loosely enclosed in lemma; dwarf arctic-alpine species **Phippsia algida** [B]
 - C. Infl paniculate or racemose; glumes > 2 mm long, longer than equal to lemma length; fruit at maturity adherent to lemma; tall widespread species
 - D. Lemma hard, firmly encasing fruit with long terminal awns; callus bearded
 - E. Awn not twisted, < 3 times as long as lemma
 - F. Lvs flat, panicle contracted and spike-like **Oryzopsis asperifolia** [M]
 - F. Lvs involute; panicle open
 - G. Lemmas smooth to short-hairy below on back ¹⁷; awn 0.5–2 mm long, deciduous ¹⁷ **Piptatheropsis pungens** [M]*
 - G. Lemmas evenly hairy across back ¹⁷; awn 2–3 mm long, persistent ¹⁷ **Eriocoma**
 - E. Awn twisted and bent, 4–10 times as long as lemma
 - H. Glumes > 18 mm long; awns 100–150 mm long **Hesperostipa comata ssp. comata** [M]*
 - H. Glumes < 10 mm long; awns to 30 mm long **Eriocoma**
 - D. Lemmas membranaceous; callus not bearded
 - I. Spikelet disarticulating below glumes **Cinna latifolia** [B]
 - I. Spikelet disarticulating above glume
 - J. Lemma surrounded at base by a tuft of stiff hairs, in some species reaching to tip of lemma; lemmas awned dorsally **Calamagrostis**
 - J. Lemma lacking well-developed tufts of hair at base
 - K. Glume approximately to notably longer than lemma
 - L. Rachilla not elongated behind palea ²⁹ **Agrostis**
 - L. Rachilla elongated behind palea into minute bristle ²⁹ **Podagrostis humilis** [M]+
 - K. Glume shorter than lemma
 - M. Lemma awned to mucronate at tip ⁴⁷ **Muhlenbergia**
 - M. Lemmas awnless
 - N. Medium to small wiry leafed grass, < 6 mm wide; panicle usually < 12 cm long; spikelets < 3 mm long **Muhlenbergia**
 - N. Coarse broad-lvs, 2–15 mm wide, with 10–20 cm long panicle; spikelets > 4 mm long ²⁹ **Arctagrostis**

GROUP 3

- A. Infl evidently paniculate; spikelets 3-flw, with central floret perfect and lateral ones staminate; medium to small grasses **Anthoxanthum**
- A. Infl dense, spike-like; spikelets appearing 1-flw, with central floret perfect and lateral ones reduced to sterile scales; plant tall with coarse broad-lvs **Phalaris**

GROUP 4

- A. Lemma distinctly villous on callus, 7-veined; tall wetland grass *Scolochloa festucacea* [M]
- A. Lemma not villous on callus, 3–5 veined
 - B. Glume distinctly longer than spikelet; arctic coastal plant on wet sites *Dupontia fisheri* [B]
 - B. Glume shorter than spikelet; widespread in nonarctic areas
 - C. Lemma bifid at apex, awned from notch or just below
 - D. Callus of floret bearded *Schizachne purpurascens* [M]
 - D. Callus of floret not bearded *Bromus*
 - C. Lemma not bifid at apex; if awned, apical
 - E. Glume nearly as long as lowermost floret
 - F. Spikelets in dense one-sided clusters *Dactylis glomerata* [X]
 - F. Spikelets not in dense one-sided clusters; mostly arctic species
 - G. Lvs broad and flat, yellowish green or purplish; ligules lacerate; tall marsh plant from a creeping rhizome *Arctophila fulva* [B]
 - G. Lvs flat or folded, yellowish green with a metallic luster; ligules entire; dwarf terrestrial tufted plants with crinkly roots. *Puccinellia*
 - E. Glume shorter than lowermost floret
 - H. Lateral lemma nerves arched or converging; lemma awnless, acuminate or awned
 - I. Lemma distinctly keeled; tip blunt or erose *Poa*
 - I. Lemmas distinctly rounded on the back
 - J. Lemma awnless, tip blunt or erose *Poa*
 - J. Lemma awned or with acuminate tip *Festuca*
 - H. Lateral nerves of lemma parallel; lemma awnless, with blunt or rounded tip
 - K. Lemmas obscurely veined *Puccinellia*
 - K. Lemmas prominently veined
 - L. Rhizomes absent; culms rooting at nodes; leaf sheaths split to base *Torreyochloa pallida* var. *pauciflora* [M]
 - L. Rhizomes present; culms not rooting at nodes; leaf sheaths closed, rupturing later *Glyceria*

GROUP 5

- A. Articulation below glume, with spikelet falling entire; glumes dissimilar, with second obovate; lemma awnless *Sphenopholis intermedia* [M]
- A. Articulation above glume; glumes similar; lemma usually awned
 - B. Lemma bifid at apex, with a flat bent awn attached between lobes *Danthonia*
 - B. Lemma merely toothed at apex, awned from back of body
 - C. Glume 20–35 mm long; spikelets pendulous, with 2-flws; annual *Avena*
 - C. Glume <10 mm long; spikelet not pendulous, with 2 or more flws; perennial
 - D. Spikelet 2–6 flw, 10–15 mm long *Helictochloa hookeri* [M]
 - D. Spikelet 2–4 flw, <10 mm long
 - E. Lemma convex, awned below the middle *Deschampsia*
 - E. Lemma keeled, awned above the middle
 - F. Awn straight *Koeleria*
 - F. Awn bent and exerted
 - G. Awn long-exserted, scabrous; panicle somewhat spike-like ^{25,7} *Sibirotrisetum sibiricum* ssp. *sibiricum* [B]*
 - G. Awn barely exerted, smooth; panicle open *Vahlodea atropurpurea* [M]*

Agropyron

- A. Spike distinctly pectinate ¹⁷, over-oblong ³⁴; spikelets diverging from rachis at 30–95° ^{25,17}; lemmas usually awned, 1–6 mm long ^{25,17} *A. cristatum* [X]+
- A. Spike not pectinate, spike linear to narrowly lanceolate in outline ^{25,17}; spikelets diverging from rachis at <35° ^{25,17}; lemmas unawned or mucronate *A. fragile* [X]*

Agrostis

- A. Lemma with prominent geniculate awn, 2–4.4 mm long ^{25,50} *A. mertensii* [B]
- A. Lemma with a short straight awn or awnless
 - B. Caespitose; native species
 - C. Panicle narrowly contracted, almost spike-like *A. exarata* [M]
 - C. Panicle loose and open, paniculate

- D. Lemma nearly as long as glumes **A. clavata** [B]+
- D. Lemma half to 2/3 as long as glumes **A. scabra** [B]
- B. Stoloniferous; introduced
 - E. Panicle branched usually with spikelets at base; plants 50–100 cm tall **A. gigantea** [X]
 - E. Panicle branches lacking spikelets at base; plants typically <50 cm tall
 - F. Leaf ligule of middle and lower lvs 0.5–1.5 mm long, broader than long, blunt ²⁹;
panicle open, branches glabrous or scabrous ^{25,50}; lvs generally scabrous ²⁹ . . . **A. capillaris** [X]
 - F. Leaf ligules ≤5 mm long, blunt to lacerate, longer than broad ^{25,50}; panicle
contracted, with short scabrous branches ²⁹; lvs scabrous above ²⁹ . . . **A. stolonifera** [X]+

Alopecurus

- A. Plant decumbent at base ²⁹; spike 3–9 mm wide ^{25,35}; anthers <1.5 mm long ²⁹
 - B. Awn included in spikelet or nearly so ²⁹; anthers orangish ²⁹ . . . **A. aequalis** var. **aequalis** [B]
 - B. Awn long-exserted, geniculate ²⁹; anthers yellow or purplish ^{25,35} . . . **A. geniculatus** [X]+
- A. Plant erect or decumbent at base ²⁹; spikes typically 6–14 mm wide ^{25,35}; anthers >1.5 mm long ^{25,35}
 - C. Glume finely pubescent on margins, connate in lower 1/5 to 1/4 ^{25,35} . . . **A. pratensis** [X]
 - C. Glume densely pilose throughout, connate in lower 1/8 ^{25,35} . . . **A. magellanicus** [B]+

Anthoxanthum

- A. Culms solitary from a creeping rhizome; awn straight or lacking
 - B. Panicle narrow, composed of a few spikelets; dwarf arctic species **A. arcticum** [B]*
 - B. Panicle pyramidal; tall subarctic species **A. hirtum** [M]*
- A. Culms from short rhizomes, often appearing densely tufted; lemma of second
staminate floret with a long geniculate and twisted awn **A. monticola**
 - C. Awns on upper staminate florets 5–11 mm long, attached near base,
usually strongly geniculate (2–4 gyres) ^{25,21} . . . **ssp. alpinum** [B]*
 - C. Awns on upper staminate florets 4–7 mm long, attached at or above middle,
not or only weakly geniculate (1–2 gyres) ^{25,21} . . . **ssp. monticola** [M]

Arctagrostis

- O. Panicle <12 cm long and <2.5 cm wide; plant <50 cm tall ⁴⁷ . . . **A. latifolia** ssp. **latifolia** [B]+
- O. Panicle >20 cm long and 5 cm wide; plant to 150 cm tall ⁴⁷ . . . **ssp. arundinacea** [B]+

Avena

- A. Lemma usually pubescent on back, base much enlarged ³⁴, awn geniculate to 20 mm long ⁴⁷ . . . **A. fatua** [X]+
- A. Lemma glabrous or sparsely pubescent on back, awnless or straight and short ⁴⁷ . . . **A. sativa** [X]

Bromus

- A. Plant rhizomatous
 - B. Lemma glabrous, scabrous or hirsute on base or on nerves; ligule 0.5–3 mm long;
awns 1–2 mm long . . . **B. inermis** [X]
 - B. Lemmas villous, especially toward margins; ligule to 0.5 mm long; awns 1–6 mm
long . . . **B. pumpellianus** [B]
- A. Plants tufted ^{14,29}
 - C. First glume with keel and 1 or 2 pairs of lateral nerves ²⁹ . . . **B. commutatus** [X]+
 - C. First glume with only keel nerve ²⁹
 - D. Lemma pubescent on back ²⁹; sheath and nodes glabrous ²⁹ . . . **B. richardsonii** [M]+
 - D. Lemma glabrous on back ²⁹, pubescent margins ²⁹; sheaths and nodes pubescent ²⁹ . . . **B. ciliatus** [M]

Calamagrostis

- A. Awn longer than glumes, twisted and bent when dry . . . **C. purpurescens** [B]
- A. Awn shorter than or equaling glumes, straight or twisted
 - B. Awn geniculate, once or twice twisted when dry, with tip usually protruding from
side of spikelet; arctic meadows . . . **C. deschampsoides** [B]
 - B. Awn straight or twisted less than once, only slightly geniculate; widely distributed
 - C. Panicle usually open and lax; callus hairs not tufted, as long as lemma
 - D. Panicle branches shorter, <40 mm long; culms with 2 or 3 nodes;
glumes 4–5.5 mm long . . . **C. lapponica** [B]
 - D. Panicle branches 30–80 mm long, sparsely to densely flwed along upper half;
culms with 3–8 nodes, glumes 3–6 mm long . . . **C. canadensis**
 - E. Glumes 3–4.5 mm long, usually scabrous and thin, hyaline along margins;

- awn usually delicate and inconspicuous **var. canadensis** [M]
 E. Glumes 4–6 mm long, thicker and less often hyaline along margins;
 awn slender, sometimes somewhat twisted **var. langsдорffii** [B]
 C. Panicle stiff, erect, its branches appressed except at time of flying;
 callus hairs 1/3 to almost as long as lemma **C. stricta**
 F. Longest callus hairs approximating lemma length ²⁹; ligules 3–6 mm long ²⁹;
 plants 40–100 cm or more tall **ssp. inexpansa** [B]
 F. Longest callus hairs distinctly shorter than lemma ²⁹; ligule 1–3.5 mm long;
 plant 40–60 cm or more tall
 G. Glumes dull, somewhat scabrous on margins ²⁹; panicle grayish-brown ²⁹ **ssp. stricta** [B]
 G. Glumes shiny, glabrous on margins ²⁹; panicle purplish-black when young ²⁹ **C. holmii** [B]+
- Danthonia**
 A. Lemmas 7–10 mm long; lvs involute to flat, 1–3 mm broad **D. intermedia** [B]
 A. Lemmas 4–5 mm long; lvs usually involute, 0.5–2 mm broad **D. spicata** [M]
- Deschampsia**
 A. Basal leaf blades 3–5 ribbed, ribs smooth or papillose ^{25,18} **D. sukatschewii** [B]+
 A. Basal leaf blades 5–11 ribbed, ribs usually scabrous ^{25,18}
 B. Plant <30 cm tall; panicle contracted; glumes and lemmas herbaceous, usually dark
 purple; awns attached below middle of lemmas **D. cespitosa ssp. septentrionalis** [B]*
 B. Plant taller; panicle open and more or less pyramidal, at least at maturity; glumes and
 lemmas thin and translucent; awns attached near base of lemmas **ssp. cespitosa** [B]
- Elymus**
 A. Lemmas with awns longer than body, awn usually >7 mm long
 B. Spikelets all or mostly solitary at each node
 C. Awns straight, stout, 20–30 mm long, erect **E. trachycaulus ssp. subsecundus** [M]
 C. Awns curved at maturity, 10–20 mm long, strongly divergent **Pseudoroegneria spicata** [M]*
 B. Spikelet usually >1 per node
 D. Spikes long and thin, spindly, flexuous and nodding **E. sibiricus** [B]
 D. Spikes upright or only slightly curved
 E. Lower spike nodes with 1–2 spikelets, upper nodes with 1
 spikelet ^{25,23} **× Elyhordeum macounii** +
 E. Spikes with 2 spikelets per node **E. glaucus ssp. glaucus** [M]
 A. Lemma with awn equal to or shorter than body, awn usually <7 mm long
 F. Lemma and glumes densely hairy ^{25,23} **E. lanceolatus ssp. psammophilus** [M]*
 F. Lemma and glumes glabrous to somewhat hairy or scabrous
 G. Glume awl-shaped ³⁴ **Psathyrostachys juncea** [X]+
 G. Glumes not awl-shaped
 H. Glume usually narrowly obovate or broadly oblanceolate, with broad
 scarious margin, conspicuously wider near apex
 I. Glumes 3/4 or more the length of spikelet; nodes of culm glabrous **E. violaceus** [B]*
 I. Glumes 1/2 to 2/3 the length of spikelet; nodes of culm hairy **E. alaskanus**
 J. Glume and lemma densely hairy **ssp. hyperarcticus** [B]
 J. Glume glabrous; lemmas more or less hairy toward apex **ssp. alaskanus** [B]
 H. Glume narrowly lanceolate or elliptic (sometimes ovate) gradually tapering
 from middle toward tip, often with narrow hyaline-scarious margin
 K. Plants with long and well developed rhizome
 L. Leaf sheaths pubescent or glabrous proximally ^{25,23}; anthers >3 mm long;
 auricles to 0.3–1 mm long ^{25,23}; anthers 4–7 mm long ^{25,23} **E. repens** [X]
 L. Leaf sheaths glabrous; anthers <3 mm long; auricles <0.5 mm long ^{25,23};
 anthers <3 mm long
 M. Lvs mostly basal concentrated ^{25,23}; auricles 0.3–0.5 mm long ^{25,23}; ligule
 0.2–0.5 mm long ^{25,23}; spikelets 11–14 mm long, lemmas 8.5–10 mm long,
 anthers 1.8–2 mm long ^{25,23} **× Elylymus hirtiflorus** +
 M. Lvs more evenly distributed along culm ^{25,23}; auricles 0–0.3 mm long ^{25,23};
 ligules about 0.5 mm long ^{25,23}; spikelets 15–20 mm long, lemmas
 10–15 mm long ^{25,23}; anthers ~2.8 mm long ^{25,23} **× Elylymus ontariensis** +
 K. Plant tufted or with short rhizomes
 N. Glume ~3/4 or more the length of spikelet,

- 3–7 veined *E. trachycaulus* ssp. *trachycaulus* [B]
 N. Glumes 1/3 to 2/3 length of spikelet, 3–4 veined ^{25.23}
 O. Lemma hairy at least in lower part, awn to 7 mm long; leaf auricles
 absent ^{25.23}; culm sheath glabrous ^{25.23} *E. macrourus* [B]
 O. Lemma glabrous or hairy, awnless to 3 mm long ^{25.23}; leaf auricles
 0.2–1.8 mm long ^{25.23}; culm sheath ciliate on lower margin ^{25.23} *Thinopyrum*

Eriocoma

- A. Awns straight or weakly curved, <3 times as long as lemma ³⁴; awns to 6 mm
 long ³⁴ *E. hymenoides* [X]+
 A. Awn twisted or distinctly bent, 3–5 times as long as lemma; awns 20–30 mm long
 B. Panicle loose, open *E. richardsonii* [M]*
 B. Panicle narrow, dense *E. nelsonii* ssp. *dorei* [M]*

Festuca

- A. Plant rhizomatous *F. rubra*
 B. Blades on vegetative shoots usually flat or loosely folded ^{25.36}; adaxial sclerenchyma
 strands always present ^{25.36}; infl 9–15 cm long and anthers >3.5 mm long ^{25.36} ssp. *fallax* [X]+
 B. Blades on vegetative shoot usually folded ^{25.36}; adaxial sclerenchyma
 strands sometimes present ^{25.36}; infl <9 cm long, if longer, anthers <2.7 mm long ^{25.36}
 C. Culms usually single and widely spaced ^{25.36} ssp. *vallicola* [X]+
 C. Plant loosely to densely caespitose ^{25.36}
 D. Lemma usually moderately to densely pilose, awn ≤2.5 mm long ^{25.36};
 spikelets reddish or purplish ^{25.36} ssp. *arctica* [B]+
 D. Lemma glabrous, awn 2.4–4 mm long ^{25.36}; spikelets usually green with
 reddish violet borders ^{25.36} ssp. *rubra* [X]
 A. Moderately to densely tufted
 E. At least upper florets with leaf-like growths (proliferations) *F. viviparoidea*
 F. Plants loosely caespitose ^{25.36}; culms usually glabrous and smooth, rarely
 sparsely puberulent near infl; glumes and lemmas puberulent throughout
 or only near apex ^{25.36} ssp. *krajiniae* [M]+
 F. Plants densely caespitose ^{25.36}; culms density to sparsely puberulent below infl;
 glumes and lemmas smooth or scabrous near apex ^{25.36} ssp. *viviparoidea* [B]*
 E. Proliferations absent; florets perfect
 G. Leaf sheaths shredding into fibers ^{25.36} *F. rubra* ssp. *commutata* [X]+
 G. Leaf sheaths not shredding into fibers
 H. Plants tall, usually >40 cm; panicle typically >160 mm long ²⁰
 I. Panicle open, 10–20 cm long, with lax or recurved branches with age; lower
 infl branches often deflected to one-side of axis ²⁰; glume >4 mm long ²⁰ *F. altaica* [B]
 I. Panicle <10 cm long, with short erect or stiffly spreading branches,
 becoming spike-like after flowering; lower glume <4 mm long *F. trachyphylla* [X]
 H. Plants usually <40 cm tall; panicle typically <40 mm long
 J. Anthers 1.7–3 mm long *F. lenensis* [B]
 J. Anthers shorter
 K. Upper culms puberulent with short upwardly curved hairs *F. baffinensis* [B]
 K. Culms glabrous or nearly so
 ← ←
 L. Plants usually >30 cm tall; panicle usually >50 mm long; anthers 1–1.6 mm long *F. saximontana*
 M. Culms to 25 cm tall ^{25.36}; usually 2–3 times taller than basal leaf height ^{25.36} var. *purpusiana* [M]
 M. Culms typically 25–60 cm tall ^{25.36}; usually >3 times taller than basal leaf
 height ^{25.36} var. *saximontana* [M]
 L. Plants usually <20 cm tall; panicle about 30 mm long; anthers 0.8–1 mm long
 N. Blades of flag leaf usually >10 mm long; sheaths of flag
 hardly inflated *F. brachyphylla* ssp. *brachyphylla* [M]
 N. Blade of flag leaf shorter; sheaths of flag leaf distinctly or at least somewhat inflated
 O. Foliage fine and setaceous; lemma 2.2–3.4 mm long; Kluane region *F. minutiflora* [M]
 O. Foliage variable; lemma 3–6 mm long; distribution widespread
 P. Plant loosely tufted; culms often geniculate or semi-prostrate,
 <2 times longer than tuft foliage; lvs often glaucous; branches
 of panicle erect at anthesis; anthers 0.9–1.2 mm long *F. brevissima* [B]

- P. Plant densely tufted; culms erect, usually >2 times longer than tuft foliage; lvs not glaucous; branches of panicle spreading at anthesis; anthers 0.5–0.8 mm long *F. hyperborea* [B]

Glyceria

- A. Spikelet linear, nearly terete, >10 mm long; panicle narrow, erect *G. borealis* [M]
 A. Spikelet ovate or oblong, usually <5 mm long; panicle lax and often nodding *G. striata* [M]
 B. First glume <1 mm long; lemmas small, prominently veined *G. striata* [M]
 B. First glume 1–1.5 mm long
 C. Plant slender, usually <60 cm tall ^{25,22}; panicle <25 cm long ^{25,22}, few-flws; lvs typically 2–7.5 mm wide ^{25,22}; flw with 2 stamens ⁴⁷ *G. pulchella* [M]
 C. Plant stout, to 200–250 cm tall ^{25,22}; panicle >15–45 cm long ^{25,22}; lvs to 15 mm wide ^{25,22}; flw with 3 stamens ⁴⁷
 D. Culms to 250 cm tall ^{25,22}; upper glume 3–4 mm long ^{25,22} *G. maxima* [X]+
 D. Culms to 150 cm tall; upper glume <2.7 mm long ^{25,22} *G. grandis*
 E. Spikelets usually <6.5 mm long, 4–8 florets ^{25,22} var. *grandis* [M]
 E. Spikelets to 6–10 mm long, 5–10 florets ^{25,22} var. *komarovii* [B]+

Hordeum

- A. Awns of lemma about 10 mm long *H. brachyantherum* ssp. *brachyantherum* [B]
 A. Awns of lemma >20 mm long *H. jubatum*
 B. Glumes and lemma with awns of central spikelets 70–90 mm long ⁴⁷ ssp. *jubatum* [B]
 B. Glumes and lemma with awns of central spikelets 25–35 mm long ⁴⁷ ssp. *× intermedium* +

Koeleria

- A. Lemma awn 3–8 mm long ^{25,82} *K. spicata* [B]*
 A. Lemma awn <1.5 mm long ^{25,82}
 B. Culms finely pubescent; lemma and glumes purplish *K. asiatica* [B]
 B. Culms glabrous or only scabrous or somewhat pubescent in upper part; lemmas and glumes yellow-green, some slightly tinged with purple *K. macrantha* [M]

Leymus

- A. Plant glaucous; glumes lanceolate; plant of seashore dunes *L. mollis*
 B. Spikes 12–34 cm long, with 12–33 nodes ^{25,19}; basal leaf blades 5–15 mm wide ^{25,19}; culms 50–170 cm tall ^{25,19} ssp. *mollis* [B]+
 B. Spikes 5–16 cm long, with 3–14 nodes ^{25,19}; basal leaf blades 3–8 mm wide ^{25,19}; culms 12–70 cm tall ^{25,19} ssp. *villosissimus* [B]
 A. Plant not glaucous; glumes narrowly subulate; plant of dry open forest or grassland
 C. Spikes 10–25 cm long, 7–10 mm wide ^{25,19}; lemma awnless or <2.5 mm long, hairs <0.4 mm long ^{25,19} *L. angustus* [M]+
 C. Spikes 3–16 cm long, 8–20 mm wide ^{25,19}; lemmas awns 2–4 mm long, hairs to 2.5 mm long ^{25,19} *L. innovatus*
 D. Spikes 3–8 cm long, 15–20 mm wide ^{25,19}; back of lemma velvety-pubescent ⁴⁷ ssp. *velutinus* [B]+
 D. Spikes 8–16 cm long, 8–15 mm wide ^{25,19}; back of lemma more or less densely villous ⁴⁷ ssp. *innovatus* [M]

Lolium

- A. Lvs 5–10 mm wide; infl a panicle *L. arundinaceus* [X]*
 A. Lvs 2–5 mm wide; infl a spike
 B. Lemmas awnless or with an awn <1 mm long *L. perenne* [X]
 B. Lemma with at least some awns >1 mm long *L. multiflorum* [X]*

Muhlenbergia

- A. Lvs involute; glumes ovate, obtuse *M. richardsonis* [M]
 A. Lvs flat; glumes awl-shaped
 B. Leaf sheath rounded on the back, close, with midvein usually not conspicuous; culm internodes usually retrorse-hispidulous throughout *M. glomerata* [M]
 B. Leaf sheath keeled, loose; culm internodes hispidulous below nodes only or glabrous *M. mexicana* [M]

Phalaris

- A. Slender tufted annual; panicle ovoid, compact, 14–40 mm long³⁴ *P. canariensis* [X]
A. Coarse rhizomatous perennial; panicle elongated, open in anthesis,
contracted in fruit, 60–180 mm long³⁴ *P. arundinacea* var. *arundinacea* [M]

Phleum

- A. Sheath of upper cauline leaf inflated; panicle spike-like, short-cylindrical or
ovoid; native and alpine *P. alpinum* [B]
A. Sheath of upper cauline leaf not inflated; panicle cylindrical, many times
longer than broad; introduced, widespread *P. pratense* [X]

Poa

- A. Plant rhizomatous, sometimes weakly developed
B. Culms conspicuously flattened *P. compressa* [X]
B. Culms terete, or at most very slightly flattened
C. Surface between nerves of palea finely hairy *P. arctica*
D. Plant usually moderately to densely tufted with short or poorly developed
rhizomes^{25,80} ssp. *caespitans* [B]
D. Plant rhizomes well-developed, usually loosely tufted^{25,80}
E. Lemmas 4–6 mm long^{25,80}; lvs 2–6 mm wide^{25,80}; rachilla usually hairy^{25,80} ... ssp. *lanata* [B]
E. Lemmas <4.5 mm long^{25,80}; lvs 1–3 mm wide^{25,80}; rachilla usually
glabrous^{25,80} ssp. *arctica* [B]
C. Surface between nerves of palea glabrous *P. pratensis*
F. Some spikelets bulbiferous^{25,80} ssp. *colpodea* [B]+
F. No spikelets bulbiferous^{25,80}
G. Panicle branches smooth or nearly so^{25,80} ssp. *alpigena* [B]
G. Panicle branches mostly scabrous^{25,80}
H. Leaf blades of innovation shoots 0.4–1 mm wide, folded to involute;
adaxial leaf surface sparsely and soft hairy^{25,80} ssp. *angustifolia* [X]+
H. Leaf blades of innovation shoots, if present, at least some 1.5–4 mm wide,
flat or folded; adaxial leaf surface rarely hairy^{25,80} ssp. *pratensis* [X]
A. Plants tufted, sometimes stoloniferous
I. Anthers <1 mm long
J. Lemmas distinctly webbed at base
K. Annual; lvs yellowish green *P. annua* [X]
K. Perennial; lvs green
L. Leaf sheaths smooth²⁸; plant usually 10–30 cm tall²⁸; ligule 1–2 mm long^{25,80};
panicle 2.5–10 cm long, 1–2 branches per node^{25,80} *P. paucispicula* [B]+
L. Leaf sheaths minutely scabrous²⁸; plant usually 15–100 cm tall^{25,80}; ligule
1.5–6 mm long^{25,80}; panicle 5–15 cm long, 1–5 branches per node^{25,80} *P. leptocoma* [B]
J. Lemmas not distinctly webbed at base
M. Annual; lvs yellowish green *P. annua* [X]
M. Perennial; lvs green
N. Panicle ovate, open, branches long *P. pseudoabbreviata* [B]
N. Panicle oblong to pyramidal, contracted; branches short *P. abbreviata*
O. Lemma pubescent at base between keel and marginal nerve ssp. *abbreviata* [B]
O. Lemma glabrous between keel and marginal nerve ssp. *pattersonii* [B]
I. Anthers >1 mm long, if present
P. Lemmas distinctly webbed at base
Q. Upper ligules 4–5 mm long; first glume narrow, curved, very acute;
nerve between keel and marginal nerve of lemma prominent *P. trivialis* [X]+
Q. Upper ligules shorter; first glume narrow or broader; nerve between
keel and marginal nerve of lemma less prominent
R. Spikelets usually glaucous; culm with 2 or rarely 3 nodes; plant generally glaucous . *P. glauca*
S. Culms 10–80 cm tall^{25,80}; infl 3.5–20 cm long^{25,80}; calluses usually webbed^{25,80};
lemmas veins pubescent, intercostal regions glabrous or puberulent^{25,80} .. ssp. *glauca* [B]
S. Culms typically 5–15 cm tall^{25,80}; infl 1–5 cm long^{25,80}; calluses glabrous^{25,80};
lemmas at least sparsely puberulent in intercostal region^{25,80} ssp. *rupicola* [M]
R. Spikelets not glaucous; culm with 4 or 5 nodes; plant generally not glaucous
T. Panicle usually flexuose; leaf ligules <1 mm long, truncate, minutely
ciliate^{25,80} *P. nemoralis* [X]

- T. Panicle rigid and open; ligule 1–6 mm long, apex obtuse to acute, occasionally truncate ^{25.80}, not ciliate
- U. Panicle typically 13–30 cm long ^{25.80}; lemmas 2–3 mm long ^{25.80}; leaf ligule often lacerate and minutely ciliate ^{25.80} *P. palustris* [B]
- U. Panicle <17 cm long ^{25.80}; lemma 2–6 mm long; leaf ligule rarely lacerated ^{25.80}
- V. Lemma 2.4–4 mm long ^{25.80}; leaf ligule apex ciliate ^{25.80}; anthers with full term development *P. interior* [B]*
- V. Lemma 2.7–7 mm long ^{25.80}; leaf ligule entire or lacerate ^{25.80}; anther sometimes aborted late in development ^{25.80} *P. arctica* ssp. *caespitans* [B]
- P. Lemma not distinctly webbed at base
 - W. Lemmas with long lanate hairs between keel and marginal nerve *P. alpina*
 - X. Spikelets not bulbiferous ^{25.80} ssp. *alpina* [M]
 - X. Spikelets bulbiferous ^{25.80} ssp. *vivipara* [M]+
 - W. Lemmas without long lanate hairs between keel and marginal nerves
 - Y. Lemmas glabrous
 - Z. Plant dioecious; lvs ~1 mm wide, glabrous *P. porsildii* [B]
 - Z. Plant monoecious; lvs filiform, scabrous *P. cusickii* ssp. *pallida* [M]+
 - Y. Lemma scabrous or puberulent
 - a. Lemmas compressed, keel distinct *P. glauca* (see “S” couplet)
 - a. Lemmas rounded on back, keel indistinct or lacking
 - b. Spikelets bulbiferous ^{25.80} *P. hartzii* ssp. *vrangelica* [B]
 - b. Spikelets not bulbiferous ^{25.80} *P. secunda*
 - c. Lemma usually glabrous or scabrous ^{25.80}, keel and marginal veins sometimes sparsely puberulent at base ^{25.80} ssp. *juncifolia* [M]
 - c. Lemma sparsely to densely puberulent on lower 2/3 ^{25.80}, keel and marginal veins with long-villous, crisply pubescent ssp. *secunda* [M]

Puccinellia

- A. Nonarctic nonlittoral species; culms 20–55 cm tall; inhabiting floodplains, riverbanks, and waste places
 - B. Culm to 15 cm tall ^{25.37}; lower glumes 2–3.5 mm long ^{25.37} *P. vahliana* [B]*
 - B. Culm to 100 cm tall ^{25.37}; lower glumes <1.5 mm long ^{25.37}
 - C. Lemmas acute or subacute; glume more or less keeled; lvs 1–2 mm wide ^{25.37} *P. nuttalliana* [B]
 - C. Lemmas obtuse or truncate; glumes not keeled; lvs 2–5 mm wide *P. distans*
 - D. Anthers >0.8 mm long ¹⁷ ssp. *distans* [X]
 - D. Anthers <0.6 mm long ¹⁷ ssp. *hauptiana* [B]*
- A. Arctic species, with erect-ascending culms often <20 cm tall, inhabiting tundra or seashores
 - E. Glumes and lemmas erose-ciliate, at least with age
 - F. Glumes always ciliate *P. vaginata* [B]+
 - F. Glumes entire, becoming erose or toothed but not ciliate in age
 - G. Lemma typically 3–4.5 mm long ^{25.37}; anthers 0.5–1.4 mm long ^{25.37}; panicle 5–30 cm long ^{25.37}; growing south of 65° N ^{25.37} *P. nutkaensis* [M]*
 - G. Lemma typically 2.5–3.7 mm long ^{25.37}; anthers 1.2–2.2 mm long ^{25.37}; panicle 3–11 cm long ^{25.37}; growing north of 65° N ^{25.37} *P. arctica* [B]
 - E. Glumes and lemmas entire, nor evidently erose-ciliate even in age
 - H. Anthers 1.2–2 mm long
 - I. Stoloniferous; anthers without pollen; plant propagating vegetatively *P. phryganodes* [B]
 - I. Caespitose without stolons; anthers with pollen; plant not commonly propagating vegetatively *P. arctica* [B]
 - H. Anthers 0.5–1 mm long
 - J. Lemma herbaceous throughout, prominently veined, often with hairs at their base; anthers ~0.5 mm long *P. tenella* ssp. *langeana* [B]*
 - J. Lemma firm throughout, or at most scarious-translucent in upper 1/3; veins not prominent; anthers 0.6–1 mm long
 - K. Lemma conspicuously hairy, especially in lower part; keels of palea often woolly-haired; glumes and lemma not coarsely toothed *P. angustata* [B]+
 - K. Lemma glabrous or only sparsely hairy on nerves near base; keels of palea glabrous or sparsely spinulose near summit; glumes and lemma often coarsely toothed *P. andersonii* [B]

Thinopyrum

- A. Plant not rhizomatous ^{25,20}; glumes truncate, midvein about equal in length and as prominent as the lateral veins, glabrous, 5–9 veined ^{25,20} ***T. obtusiflorum*** [X]+
- A. Plant rhizomatous ^{25,20}; glumes obliquely truncate or obtuse to acute, midvein usually slightly longer and more prominent than the lateral veins, glabrous or with 1–1.5 mm long hairs; lower glume 5–6 veined, upper glume 5–7 veined ^{25,20} ***T. intermedium* ssp. *intermedium*** [X]+

POLEMONIACEAE

- A. Lvs entire
 - B. Plants annual; at least upper lvs alternate; calyx enlarging and covering the capsule ³⁴ ***Collomia linearis*** [B]
 - B. Plants perennial; lvs opposite; calyx not enlarged and covering the capsule ***Phlox***
- A. Lvs pinnate or pinnatifid
 - C. Lvs pinnatifid; flws in dense, globular, long-pedunculate heads ***Gilia capitata* ssp. *capitata*** [X]
 - C. Lvs pinnate; flws cymose to paniculate, with short- to long-pedicelate ***Polemonium***

Phlox

- A. Lvs flat; calyx with gland-tipped hairs; flws to 30 mm across ***P. alaskensis*** [B]
- A. Lvs awl- or boat-shaped; calyx with arachnoid hairs; flws smaller (10 mm diameter)
 - B. Lvs awl-shaped ***P. hoodii* ssp. *hoodii*** [B]
 - B. Lvs boat-shaped, grooved along the midvein on adaxial surface ***P. richardsonii*** [B]

Polemonium

- A. Lvs glabrous or nearly so on both sides; flw petals somewhat acute, usually ciliate on margins ³¹; stem simple and upright, unbranched, to 100 cm tall ***P. villosum*** [B]*
- A. Lvs glandular-pubescent on both sides ²⁹; flw petal apically rounded, glabrous margins; stems typically branched and decumbent, <35 cm tall
 - B. Calyx lobes glabrous or much less pubescent than tube ²⁹; lfts 10–15 per side ²⁹, apically rounded, with short viscid pubescence ²⁹ ***P. pulcherrimum*** [B]
 - B. Calyx lobes pubescent to tip ²⁹; lfts usually <10 per side ²⁹, apically acute, with long viscid pubescence ²⁹
 - C. Flws 5–15 ³⁸; infl capitate ³⁸; stigma occurring below anthers ³⁸; anthers yellow ³⁸ ***P. villosissimum*** [B]+
 - C. Flws 1–5 ³⁸; infl. open ³⁸; stigma equaling or above anthers ³⁸; anthers white ³⁸ ***P. boreale*** [B]

POLYGONACEAE

- A. Scapose; flws subtended by an involucre; flws yellowish ³⁴ ***Eriogonum flavum* var. *aquilinum*** [E]
- A. Stems leafy; flws without an involucre; calyx not yellowish
 - B. Stigma tufted
 - C. Lvs reniform; tepals 4 ***Oxyria digyna*** [B]
 - C. Lvs not reniform; tepals 6 ¹⁷ ***Rumex***
 - B. Stigmas capitate ^{17, 25,44}
 - D. Plant diminutive, <15 cm tall, stem filiform; tepals 3; arctic or high alpine; annual ***Koenigia***
 - D. Plant large, >15 cm tall; stem coarser; various habitats
 - E. Tepals 6 ^{25,44}; achene broadly 3-winged, to 10 mm long ⁴⁷; basal lvs often 20–40 cm wide, somewhat longer than wide ***Rheum rhabarbarum*** [X]+
 - E. Tepals 5 or fewer, often petaloid; achenes typically to 2–3 mm long; lvs much smaller
 - F. Outer tepals winged or keeled ^{25,44}
 - G. Lvs cordate or hastate proximally to sagittate ^{25,44}; stem twining; ocreae cylindrical, tan to brownish ^{25,44}; terrestrial ***Fallopia convolvulus*** [X]*
 - G. Lvs lanceolate-oblong to elliptic ^{25,44}; stem erect-ascending or prostrate ^{25,44}; ocreae 2-lobed distally, often hyaline ^{25,44}; terrestrial, often disturbance sites ***Polygonum***
 - F. Outer tepals neither winged nor keeled ^{25,44}
 - H. Lvs mostly basal; infl terminal, spike-like; stem usually simple ***Bistorta***
 - H. Lvs cauline; infl terminal or axillary; stem often branched ^{25,44}
 - I. Ocreae often hyaline, silvery, glabrous, 2-lobed distally, often disintegrating into fibers or completely ^{25,44} ***Polygonum***
 - I. Ocreae papery, tan, brown, or reddish, glabrous or pubescent, never 2-lobed distally, often disintegrating with age ^{25,44}
 - J. Infl compact, spike- or panicle-like, or capitate ^{25,44}; tepals connate

- 4 or 15, connate 1/2 to 2/3 their length ^{25.44}; stamens 5–6 ^{25.44} *Persicaria*
- J. Infl open, raceme- or panicle-like ^{25.44}; tepals 5, connate ~1/4 their length ^{25.44}; stamens 8 ^{25.44} *Koenigia*
- Bistorta**
- A. Spike narrow, normal white or pinkish flws in upper part, with bulbils in lower part *B. vivipara* [B]*
- A. Spike usually >10 mm thick, short cylinder, flws often deep pink; lacking bulbils *B. plumosa* [B]*
- Koenigia**
- A. Tepals usually 3 ^{25.66}; diminutive arctic or high alpine annual *K. islandica* [B]
- A. Tepals >3; plant large ^{25.66}; large boreal or subarctic perennial
- B. Leaf blade pubescent; stem usually densely retrorsely pubescent ^{25.66} *K. alaskana* var. *alaskana* [B]*
- B. Leaf blades glabrous except on margins; stem mostly glabrous ^{25.66} var. *glabrescens* [B]+
- Persicaria**
- A. Annual, terrestrial; flws in terminal and axillary spikes; calyx pink, greenish to white, ... *P. lapathifolia* [B]*
- A. Perennial, aquatic or amphibious plants; infl lacking axillary spikes; calyx bright pink ¹⁷ *P. amphibia*
- B. Stalks usually glandular-hairy ²⁰; infl usually at least 40 mm long, cylindric ²⁰ var. *emorsa* [M]+
- B. Stalks usually smooth ²⁰; infl <40 mm long, ovate ²⁰ var. *stipulacea* [M]*
- Polygonum**
- A. Stem 4-angled, ribs obscure or absent ^{25.33}; leaf blade venation parallel ^{25.33}; fruit usually reflexed downward ¹⁵ *P. douglasii* [M]
- A. Stem distinctly and regularly 8–16 ribbed ^{25.33}; leaf blade venation pinnate ^{25.33}; fruit usually erect ¹⁵
- B. Lvs often opposite at proximal nodes ^{25.33}; stem prostrate often zigzagged branched ^{25.33} *P. humifusum* ssp. *caurianum* [B]*
- B. Lvs all alternate ^{25.33}; plant prostrate to somewhat ascending ^{25.33}
- C. Stem erect ¹⁵ to decumbent with age ^{25.33}; lvs yellowish green ^{25.33}; achene dull ²⁹, yellow-green to tan ^{25.33} *P. achoreum* [M]
- C. Stem prostrate or spreading ^{15, 28}; lvs green to grayish green, sometimes purplish tinged ^{25.33}; achene dull or shiny and brownish ^{25.33}
- D. Lvs elliptic to elliptic-obovate, light green ^{25.33}; achene lustrous ²⁹ *P. fowleri* ssp. *fowleri* [X]+
- D. Lvs linear to oblong or elliptic, green to grayish green ^{29, 25.33}; achene dull ²⁹ *P. aviculare*
- E. Perianth tube >40% of perianth length ^{25.33} ssp. *depressum* [X]+
- E. Perianth tube <40% of perianth length ^{25.33}
- F. Perianth 3.3–5.5 mm long ^{25.33}; achene 2.5–4.2 mm long ^{25.33} ssp. *aviculare* [X]
- F. Perianth 1.9–3.6 mm long ^{25.33}; achenes 1.2–3 mm long ^{25.33}
- G. Oreae disintegrating ^{25.33}; outer tepals lacking basal pouch ^{25.33} ssp. *aviculare* [M]
- G. Oreae persistent distally ^{25.33}; outer tepals pouched at base ^{25.33} ssp. *buxiforme* [M]*
- Rumex**
- A. Flws dioecious ^{25.63}; lvs often hastate at base
- B. Basal lvs lacking proximal basal lobes ^{25.63}, blades narrowly linear or spatulate-linear ^{25.63}; plant tufted ^{25.63} *R. beringensis* [B]+
- B. Basal lvs with proximal lobes; blades broader; plant erect ^{25.63}
- C. Lvs with sagittate bases, acute to subacute lobes directed downward ^{25.63} *R. lapponicus* [B]+
- C. Lvs with hastate bases, with linear to oblong lobes ¹⁷, or somewhat triangular that are divergent ²⁹; rhizome slender *R. acetosella* [X]
- A. Flws perfect; lvs usually rounded or cordate at base
- D. Annual or biennial; perianth with marginal spinule
- E. Median cauline lvs with cuneate base ²⁹; leaf margins flat to weakly undulating ^{25.63}; fruit yellowish ²⁹ *R. maritimus* [B]+
- E. Median cauline lvs with truncate ²⁹ to somewhat cordate base ^{25.63}; leaf margins entire or subentire to obscurely repand, undulating to crisped ^{25.63}; fruit brownish ²⁹ *R. fueginus* [M]*
- D. Perennial; inner perianth parts entire or merely denticulate
- F. Stem decumbent or ascending, with axillary shoots *R. triangulivalvis* [M]*
- F. Stem erect, sometimes decumbent at base, without axillary shoots
- G. Inner perianth parts with at least 1 grain-like tuberosity
- H. Stem lacking axillary shoots ²⁹ *R. crispus* [X]
- H. Stem with axillary shoots ²⁹ *R. sibiricus* [B]+

- G. Inner perianth parts lacking or obscure grain-like tuberosities
 - I. Pedicels distinctly jointed below the middle ⁴⁷; lvs oblong, lanceolate, or narrowly lanceolate with cuneate, truncate, or indistinctly cordate base ^{25,63}
 - J. Valves 3–5 mm wide ³⁴; lower cauline lvs narrowly lanceolate, to 8 times longer than broad ³⁴; margins very strongly wavy-curved ⁴⁷ ***R. pseudonatronatus*** [X]+
 - J. Valves >5 mm wide ³⁴; lower cauline oblong-lanceolate to narrowly ovate ⁴⁷, to 4 times longer than broad ³⁴; margins flat or slightly undulating ⁴⁷ ***R. longifolius*** [X]
 - I. Pedicels obscurely jointed below the middle ⁴⁷; lvs ovate- to oblong-lanceolate or ovate-triangular with cordate, cuneate, rounded, or occasionally truncate base ^{25,63}
 - K. Lvs narrowly oblong, mostly with an obtuse tip and a cuneate base; plant strongly suffused with purple ***R. arcticus*** [B]
 - K. Lvs oblong, usually with an acute tip and a truncate to cordate at base; plant usually green ***R. occidentalis*** [M]

POTAMOGETONACEAE

- A. Lvs opposite, filiform ***Zannichellia palustris*** [B,M]
- A. Lvs mostly alternate, usually broader
 - B. Plants wholly submersed in alkaline water; lvs linear-capillary; fruit in umbelliform cluster, with long spiraling peduncle ³⁴ (**RUPPIACEAE**) ***Ruppia cirrhosa*** [B,M]
 - B. Plants with submersed or floating lvs, fresh or rarely brackish water; lvs usually broader; flws and fruits in spikes or heads
 - C. Stipular sheaths of submersed lvs adnated to base of leaf blade for $\geq 2/3$ of stipule length ^{25,51}; lvs all submersed ^{25,51}; submerged leaf blades opaque, channeled, turgid ^{25,51} ***Stuckensia***
 - C. Stipular sheaths of submersed lvs free from base of leaf blade, or if adnated, then <1/2 stipule length ^{25,51}; lvs both submersed and floating, or all submersed ^{25,51}; submerged leaf blades translucent, not channeled, flattened ^{25,51} ***Potamogeton***

Potamogeton

- A. Floating lvs usually present and different from submersed lvs
 - B. Stipules firm, 40–100 mm long; submersed lvs linear, very narrow, soon disintegrating ***P. natans*** [B]
 - B. Stipules soft, 10–30 mm long; submersed lvs broader, persistent
 - C. Submersed lvs 50–200 mm long, linear-lanceolate to oblong; whole plant with a reddish tinged; floating lvs not always present, obovate to oblanceolate ***P. alpinus*** [B,M]
 - C. Submersed lvs 30–80 mm long, linear ³⁴, narrowly elliptic or oblanceolate ¹⁷; plant green, floating lvs usually present ¹⁷, ovate to elliptic ³⁴ ***P. gramineus*** [B]
- A. Lvs all submersed and alike
 - D. Lvs not linear, >4 mm wide
 - E. Stipules 30–50 mm long, white; lvs half-clasping, >100 mm long ***P. praelongus*** [B]
 - E. Stipules inconspicuous, soon disintegrating; lvs cordate-clasping, <100 mm long ***P. richardsonii*** [B]
 - D. Lvs all linear, <4 mm wide
 - F. Lvs 9–35 veined, sometimes apparent only under magnification
 - G. Plant bright green; lvs 2–4 mm wide, 15–35 veined ***P. zosteriformis*** [B]
 - G. Plant dull green or brownish yellow, lvs 1.5–2 mm wide, 9–17 veined ***P. subsibiricus*** [B]
 - F. Lvs 3–7 veined
 - H. Stipule not connate (fused) with leaf base or petiole ***P. obtusifolius*** [B]
 - H. Stipules connate, margins united 2/3 their length
 - I. Stipules strongly fibrous ¹⁷, strongly ribbed, shredding with age ³⁴; 3–7 veined
 - J. Lvs flat, obtuse often with mucronate tip, 5–7 veined ³⁴; peduncles flattened and slightly clavate ³⁴ ***P. friesii*** [B]
 - J. Lvs gradually tapered into a slender tip, firm ³⁴, usually 3–5 veins ³⁴; peduncles very slender ³⁴ ***P. strictifolius*** [B,M]+
 - I. Stipules membranaceous or scarious; not strongly ribbed nor shredding with age; lvs 3–5 veined
 - K. Gland absent at leaf base; peduncles <10 mm long ***P. foliosus* ssp. *foliosus*** [B,M]+
 - K. Gland present at leaf base; peduncles 10–50 mm long
 - L. Mature fruit widest above middle, sides concave ^{25,51}; beak usually pointing toward adaxial edge, rarely towards median ^{25,51}; peduncles filiform to cylindric ^{25,51} ***P. pusillus*** [B]+
 - L. Mature fruit widest below middle, sides rounded; beak rarely pointing toward adaxial edge, peduncles cylindric ^{25,51} ***P. berchtoldii* ssp. *berchtoldii*** [B]

Stuckenia

- A. Primary stipule sheaths loose from stem, 20–40 mm long, 2–5 times wider than stem, not connate ²⁹; spike with 5–12 whorls of flws ²⁹ **S. vaginata** [M]*
- A. Primary stipule sheaths tightly adhered to stem ²⁹, <20 mm long ¹⁷; spike with 2–6 whorls of flws ²⁹
 - B. Lvs with long-tapering acute tips; fruit 3–4 mm long; beak with stigma >0.5 mm long ^{25,58}. **S. pectinata** [B]*
 - B. Lvs mostly obtuse-tipped; fruit 2–3 mm long; stigma sessile **S. filiformis** [B,M]

PRIMULACEAE

- A. Plant with leafy stem **Lysimachia**
- A. Plant scapose
 - B. Plant densely caespitose or with a dense rosette; flws solitary, and short-pediceled or sessile in a few-flwd umbel **Douglasia**
 - B. Plant with basal rosette(s); flws in terminal umbels
 - C. Corolla lobes reflexed; calyx deeply cleft **Primula**
 - C. Corolla lobes spreading; calyx tubular
 - D. Throat of corolla constricted; style short **Androsace**
 - D. Throat of corolla not constricted; style elongate **Primula**

Androsace

- A. Perennial; scapes villous with simple hairs **A. chamaejasme ssp. lehmanniana** [B]
- A. Annual or biennial; scapes glabrous or with minute branched hairs **A. septentrionalis** [B]

Douglasia

- A. Plant with a single basal rosette and multiple scapes originating from a central area **D. alaskana** [B]
- A. Plant with multiple rosettes or caespitose cushions
 - B. Lvs glabrous above, ciliate on margins with simple hairs **D. arctica** [B]
 - B. Lvs pubescent above, ciliate on margins with simple or forked hairs
 - C. Lvs with branched hairs **D. gormanii** [B]
 - C. Lvs mostly with simple or rarely some branched hairs **D. ochotensis** [B]

Lysimachia

- A. Plant 20–80 cm tall; flws in dense axillary racemes **L. thyrsiflora** [B]
- A. Plant typically <20 cm tall; flws not in dense axillary racemes
 - B. Flws small, corolla absent, sessile, solitary in axils; lvs opposite proximally and alternate distally, succulent, plant grayish green **L. maritima** [B]*
 - B. Flws corolla >8 mm wide, pediceled and extending above lvs
 - C. Flws white; uppermost lvs broadly elliptical, oblanceolate to obovate; stem lvs small but not scale-like **L. europaea** [B]*
 - C. Flws pink; uppermost lvs broadly lanceolate; stem lvs scale-like **L. latifolia** [M]*

Primula

- A. Corolla lobes reflexed; calyx deeply cleft
 - B. Filament tube not exposed, filaments ≤ 1 mm long ²⁰; lvs oval to ovate, abruptly tapering into petiole; leaf blades <2–3 times as long as wide ²⁰ **P. frigida** [B]*
 - B. Filament tube exposed, >1.5 mm long ²⁰; lvs elliptic, gradually tapering into petiole; leaf blades >3 times longer than broad ²⁰ **P. pauciflora var. pauciflora** [M]*
- A. Corolla lobes spreading; calyx tubular
 - C. Flws large (~20 mm long); lobes of corolla only slightly emarginated **P. pumila** [B]*
 - C. Flws much smaller; lobes of corolla deeply notched
 - D. Plant robust, 15–40 cm tall; lvs usually strongly farinose below; flws with anthers and styles at the same level (homostylous) **P. incana** [M]
 - D. Plant small, usually 5–20 cm tall; lvs efarinose or only somewhat farinose below; flws homostylous or anthers not at the same level (distylous)
 - E. Lvs ovate to elliptical **P. nutans** [B]
 - E. Lvs narrower
 - F. Flws small, 6–8 mm wide; homostylous; calyx lobes glandular-ciliate **P. egalikensis** [B]
 - F. Flws 8–15 mm wide; distylous; calyx with capitate glands
 - G. Involucral bracts gibbous or saccate at base; lvs with conspicuous petioles **P. borealis** [B]

G. Involucral bracts plain at base; lvs cuneate at base *P. mistassinica* [M]

PTERIDACEAE

Cryptogramma

- A. Fronds individuals scattered along slender rhizome, deciduous *C. stelleri* [B]
 A. Fronds densely tufted from short much branched rhizome, evergreen, coriaceous
 B. Sterile fronds 2–3 pinnate, with 6 or more lobes per segment ^{25.12} *C. acrostichoides* [B]*
 B. Sterile fronds 3–4 pinnate, segments 2–6 lobed ^{25.12} *C. sitchensis* [M]*

RANUNCULACEAE

- A. Fruit berry-like; flws small, white, reddish, or greenish, in dense cylindrical raceme *Actaea rubra* [M]
 A. Fruit not berry-like and in dense cylindric raceme
 B. Fruit a follicle, opening along one side
 C. Flw shape regular, not dark blue or all white
 D. Flws bluish purple or red and yellow; petals spurred *Aquilegia*
 D. Flws yellow or white; petal without spurs
 E. Follicles sessile; lvs simple or merely cleft *Caltha*
 E. Follicles stipitate; lvs ternately cleft *Coptis trifolia* [B]
 C. Flw shape irregular, usually dark blue, sometimes white in *Aconitum*
 F. Upper sepal with long spur; flws numerous in a spike-like raceme *Delphinium*
 F. Upper sepal hooded; flws few in an open raceme *Aconitum delphiniifolium* [B]
 B. Fruit a dry achene borne in a head, or in a dense short-cylindric spike
 G. Flw petals normally present; sepals not petaloid *Ranunculus*
 G. Flw petals wanting, sepals petaloid
 H. Flws small (<10 mm long) and numerous *Thalictrum*
 H. Flws large (>10 mm long) and showy, 1 to several
 I. Styles short, not plumose; sepals yellow or white or pale blue *Anemone*
 I. Styles long and plumose; sepals purple, blue, or yellow (>20 mm long)
 J. Plants tufted, sepals purple *Pulsatilla nuttalliana* [B]*
 J. Trailing or climbing vines; sepals blue or yellow *Clematis tangutica* [X]

Anemone

- A. Plants with slender filiform horizontal rhizome; sepals distinctly yellow ... *Anemonastrum richardsonii* [B]*
 A. Plant tufted with taproot or coarser rhizome; sepals not distinctly yellow
 B. Achenes elongated, 6–9 mm long, glabrous, winged; style curved ^{20, 25.38}
 C. Petiole of basal lvs usually 15–20 cm long ^{25.38}; lateral segments of involucral bracts lobed ^{25.38}; stamens 60–100 ^{25.38} *Anemone narcissiflora* var. *villosissima* [B]+
 C. Petiole of basal lvs usually <10 cm long ^{25.38}; lateral segments of involucral bracts unlobed ^{25.38}; stamens 40–60 ^{25.38} *Anemonastrum sibiricum* [B]+
 B. Achenes small 2–4 mm long ^{25.38}, densely woolly, style straight
 D. Involucral bract of most distal tier simple ^{25.38} (3-lobed); lvs ternate ²⁹; plant rhizomatous ¹⁷ *Anemone parviflora* [B]
 D. Involucral bract of most distal tier compound ^{25.38}; lvs 3-times ternate ²⁹; plant caespitose ²⁸
 E. Plant silky-villous, usually >20 cm tall ²⁹ *Anemone multifida*
 F. Aerial shoots 30–70 cm tall; flws 2–7, involucral bracts silky; sepals ovate or oblong ^{25.38} var. *multifida* [M]
 F. Aerial shoots 10–40 cm tall; flws ≤3, involucral bracts villous; sepals elliptic ^{25.38} var. *saxicola* [M]+
 E. Plant sparsely silky-hirsute, villous to glabrate ^{25.38}; usually <25 cm tall
 G. Sepals deep purplish blue on both sides ⁴²; filaments and anthers dark-colored ⁴²; sepals silky abaxially; basal lvs ternate ⁴² *Anemone multiceps* [B]+
 G. Sepals white or tinged blue only below ⁴²; filaments and anthers not dark-colored ⁴²; sepals with appressed pubescence abaxially ⁴²; basal lvs 3–4 times 3-parted ²⁰ *Anemone drummondii*
 H. Ultimate segments of lvs mostly 1–2 mm wide ^{25.38}; lfts villous ^{25.38} ... var. *drummondii* [M]+
 H. Ultimate segments of lvs mostly 1.5–2.5 mm wide ^{25.38}; lfts nearly glabrous or pilose ^{25.38} var. *lithophila* [M]

Aquilegia

- A. Flws bluish purple; style of mature follicles 2–5 mm long **A. brevistyla** [M]
A. Flws red and yellow; styles of mature follicles >10 mm long **A. formosa** var. **formosa** [M]

Caltha

- A. Stems erect, scapose or with a single leaf **C. leptosepala** [M]
A. Stems ascending or decumbent, floating or creeping; lvs >1
B. Stems ascending or decumbent; flws yellow; carpels 6–12 **C. palustris** [B]
B. Stems floating or creeping; flws white; carpels about 30 **C. natans** [B]

Delphinium

- A. Stem hollow ³⁴, glabrous up to infl ⁴⁷, sometimes glaucous ³⁴;
follicles glabrous or pubescent **D. glaucum** [M]
A. Stem solid or nearly so ^{17, 25.89}, pubescent ^{25.89}; follicles more or less pubescent ^{25.89}
B. Infl 5–18 flwed ^{25.89}; plant usually <60 cm tall ^{25.89} **D. brachycentrum** [B]
B. Infl 25–100 flwed ^{25.89}; plant <200 cm tall ^{25.89} **D. elatum** [X]+

Ranunculus

- A. Stoloniferous, rooting at nodes; flws yellow or white
B. Aquatic or amphibious plants, with creeping or floating stems
C. Aquatic plants, with white flws and finely-dissected lvs **R. trichophyllus** [B]+
C. Amphibious plants; flws yellow or white without finely-dissected lvs
D. Primary divisions of lvs again divided; lvs floating, firm, submersed lvs flaccid **R. gmelinii** [B]
D. Primary divisions of lvs entire; lvs typically not floating or flaccid
E. Flws white; plant coarse fleshy; shallow brackish meadows **Coptidium pallasii** [B]*
E. Flws yellow; plant low, creeping, often matted; emergent or submerged **R. hyperboreus** [B]
B. Terrestrial plants; flws usually strongly yellow
F. Plants scapose
G. Sepals 3; plant with long, filiform rhizome ²⁹ **Coptidium lapponicum** [B]*
G. Sepals 5; plant with thick, short rhizome ²⁹ **Arcteranthis cooleyae** [M]+
F. Plants decumbent, rooting at nodes or with filiform runners; sepals 5
H. Lvs ternate **R. repens** [X]
H. Lvs not ternate
I. Lvs reniform-ovate, 5–25 mm long **Halerpestes cymbalaria** [M]*
I. Lvs linear or linear-lanceolate, 50–70 mm long **R. flammula**
J. Lvs essentially bladeless or with linear or filiform ^{25.93}, <1 mm wide ^{25.93} . . . var. **reptans** [M]+
J. Lvs with well-developed lance-elliptic to linear or lanceolate blades ^{25.93},
2–8 mm wide ^{25.93} . . . var. **ovalis** [M]+
A. Tufted terrestrial or paludal plants, with erect or ascending stems
K. Basal lvs entire, cordate **R. abortivus** [M]
K. Basal lvs lobed or incised
L. Plant distinctly pubescent or hirsute, especially on leaf petiole **R. macounii** [M]
L. Plants glabrous or very nearly so
M. Stems hollow; species nonarctic paludal **R. sceleratus** var. **multifidus** [M]
M. Stems solid or near so; usually arctic or alpine species
N. Flw petals equal to or shorter than sepals; typically <10 cm tall
O. Lvs broadly obovate to transverse elliptic ^{25.93} **R. sabinei** [B]
O. Lvs cordate to reniform ^{25.93}
P. Basal lvs simple or pedately 3–5 cleft, with rounded lobes ²⁹;
achene about 1 mm long, beak straight ⁴⁷ **R. pygmaeus** [B]
P. Basal lvs twice ternately divided or pedately divided with oblong
to spatulate lobes ²⁹, achene to 2.5 mm long, beak recurved ⁴⁷ **R. gelidus** [B]
N. Flw petals longer than sepals; typically >10 cm tall
Q. Sepals pubescent, but lacking yellowish to brownish hairs
R. Lvs pubescent, especially on abaxial surface ²⁹ . . . **R. occidentalis** var. **brevistylis** [M]
R. Lvs glabrous
S. Sepals linear-lanceolate; flw petals shiny, deep golden yellow **R. turneri** [B]
S. Sepals elliptic-oblong, with conspicuous black tips; flw petals pale
yellow **R. arcticus** [B]*

- Q. Sepals with yellowish, brownish to blackish hairs ¹⁷, sometimes glabrous ^{25,93}
 T. Sepals sparsely pale yellowish pubescence . . . **R. eschscholtzii** var. **eschscholtzii** [B]
 T. Sepals with densely brownish or blackish hairs
 U. Receptacle glabrous; basal lvs reniform, generally deeply
 3–5-lobed ²⁹ **R. nivalis** [B]
 U. Receptacle with reddish brown hairs; basal leaf blades ovate
 to fan-shaped, with 5–9 crenate and shallow lobes at apex ⁴⁷ . . . **R. sulphureus** [B]

Thalictrum

- A. Stems <20 cm tall, scapose or rarely 1-leaved **T. alpinum** [B]
 A. Stems >30 cm tall, leafy
 B. Lfts longer than wide ³⁴, 3-lobed ³⁴, often acute **T. dasycarpum** [X]
 B. Lfts usually wider than long ³⁴, more than 3-lobed ³⁴
 C. Flws perfect; carpels deflected to one side of pedicel, long-stipitate,
 half-moon shaped **T. sparsiflorum** [B]
 C. Flws dioecious; carpels not decidedly deflected to one side, achenes sessile or
 short-stipitate ¹⁷, achene terete or slightly flattened ^{25,67}
 D. Peduncles wide-spreading, about the same length; achene stipe 0.4–1.2 mm
 long ²⁰; beak typically 3–4.5 mm long ²⁰ **T. occidentale** [M]
 D. Peduncles ascending, of varying lengths; achenes stipe ≤0.3 mm long ²⁰;
 beak typically 1.5–2.5 mm long ²⁰ **T. venulosum** [X]

ROSACEAE

- A. Shrub or dwarf tree
 B. Fruit fleshy as a drupe, pome, or berry-like
 C. Fruit a drupe **Prunus padus** [X]+
 C. Fruit berry-like or pome
 D. Lvs pinnate
 E. Stem smooth; fruit in dense flat- or round-topped cluster **Sorbus**
 E. Stem prickly; fruit not in dense flat- or round-topped cluster
 F. Mature fruit juicy, composed of multiple drupelets (raspberry-like) **Rubus**
 F. Mature fruit pulpy, usually singular in occurrence **Rosa**
 D. Lvs simple
 G. Lvs margin toothed **Amelanchier alnifolia** var. **alnifolia** [M]
 G. Lvs margin entire **Cotoneaster lucidus** [X]+
 B. Fruit dry as achenes, follicles
 H. Lvs compound
 I. Carpels few; dwarf shrub with bi-ternately dissected lvs **Luetkea pectinata** [M]
 I. Carpels numerous; shrub larger without bi-ternately dissected lvs
 J. Flws usually yellow; lfts narrowly oblanceolate, about 10 mm long . . . **Dasiphora fruticosa** [B]*
 J. Flws not yellow; lfts usually broader and much larger;
 K. Infl an elongate terminal panicle ⁴⁷; mature fruit a follicle **Sorbaria sorbifolia** [X]+
 K. Infl not an elongate terminal panicle; mature fruit juicy, composed of
 multiple drupelets (raspberry-like) **Rubus**
 H. Lvs simple
 L. Flws normally solitary; petals 8–10; fruit a dry achene with persistent plumose style **Dryas**
 L. Flws solitary or in compound terminal or axillary panicles; petals 5; fruit achene
 lacking persistent plumose style
 M. Carpels numerous, becoming a fleshy aggregates of drupelets **Rubus**
 M. Carpels 2–5; fruit a dry few-seeded follicle **Spiraea stevenii** [B]*
 A. Herb sometimes with a woody base, but otherwise herbaceous
 N. Infl a dense, spike-like head; flw petals lacking but sepals petaloid **Sanguisorba**
 N. Infl not spike-like; both flw petals and sepals present
 O. Flws dioecious **Aruncus dioicus** var. **acuminatus** [M]
 O. Flws perfect
 P. Calyx lobes lacking bractlets; carpels numerous, becoming drupelet **Rubus**
 P. Calyx lobes alternating with bractlets; carpels 1-several, becoming dry achene
 Q. Stamens 5; carpels 5–20; flw petals equaling the sepals or slightly longer
 R. Lvs 2–4 ternately divided into linear lobes; flw petals
 slightly longer than sepals, white; calyx hirsute **Chamaerhodos erecta** [B]
 R. Lvs trifoliate, with lfts wedge-shaped, toothed

- at apex; flw petals minute, yellowish; calyx strigose ***Sibbaldia procumbens*** [B]
- Q. Stamens ≥ 10 ; carpels ≥ 10 ; flw petals often larger than sepals
- S. Basal lvs ternate
 - T. Flw petals yellow; plants without stolons; fruit dry not on flesh
receptacle (achenes) ***Potentilla***
 - T. Flw petals white; plants with slender, trailing stolons; dry
achenes on fleshy receptacle. ***Fragaria***
- S. Basal lvs with >3 lfts
 - U. Styles persistent and plumose ***Geum***
 - U. Styles articulate, deciduous and not plumose
 - V. Plant lacking long slender freely rooting stolons; flws 1 or more ***Potentilla***
 - V. Plant with long slender freely rooting stolons; flws solitary ***Argentina***

Argentina

- A. Epicalyx bractlets shorter than sepals, usually entire ^{25.41}; abaxial leaf surface sparse to
densely cottony-cripsed hairs, long hairs sparse ^{25.41} ***A. anserina* ssp. *groenlandica*** [B]*
- A. Epicalyx bractlets equal to or longer than sepals, usually toothed or dentate ^{25.41};
abaxial leaf surface with dense cottony-cripsed hairs plus commonly occurring long hairs ^{25.41}
 - B. Epicalyx bractlet length equaling sepals, usually ovate to triangular ^{25.41}; hypanthium
wider than tall when in fruit ^{25.41} ***A. anserina* ssp. *anserina*** [B]*
 - B. Epicalyx bractlets longer than sepals, linear to elliptic ^{25.41}; hypanthium
as tall as wide in fruit ^{25.41} ***A. subarctica*** [B]*

Dryas

- A. Flw petals yellow; filaments hairy; flws nodding in anthesis ***D. drummondii*** [M]
- A. Flw petals white; filaments glabrous; flws erect in anthesis
 - B. Abaxial leaf midvein surface with stipitate hairy glands, hairs
white or brown and much-branched ^{25.81} ***D. ajanensis* ssp. *beringensis*** [B]+
 - B. Abaxial leaf midvein surface generally lacking hairy glands ^{25.81}
 - C. Midvein of leaf undersurface with stalked gland
 - D. Lvs oblong, 2.5–3.5 times longer than wide; margins incised 45–60%
to midvein ^{25.81}; underside glabrate or thinly tomentose ***D. alaskensis*** [B]
 - D. Lvs elliptic, 1.5–2.5 times longer than wide; margins incised $\leq 30\%$ to
midvein ^{25.81}; underside densely tomentose between nerves ***D. hookeriana*** [M]
 - C. Midvein on leaf undersurface often submerged under tomentum
and lacking stalked glands
 - E. Leaf margins serrate, crenate to dentate to apex ^{25.81} ***D. incisa*** [B]+
 - E. Leaf margins entire or dentate, crenate, or serrate in proximal half ^{25.81} ***D. integrifolia***
 - F. Leaf margin strongly revolute, base cordate or truncate ^{25.81} **ssp. *integrifolia*** [B]
 - F. Lvs flat or margins weakly revolute, base cuneate or rounded **ssp. *sylvatica*** [B]

Fragaria

- A. Leaf petioles and flw peduncles with appressed hairs; flw petals narrowly
ovate ²⁰ ***F. virginiana* ssp. *glauca*** [M]
- A. Leaf petioles and flw peduncles with spreading hairs; flw petals nearly circular ²⁰ **ssp. *platypetala*** [M]+

Geum

- A. Lfts on basal lvs more or less alike
 - B. Flws straw-colored to pale purple; dry grassy boreal areas ***G. triflorum* var. *triflorum*** [M]
 - B. Flws yellow; plant of alpine and arctic sites
 - C. Lvs and stem conspicuously villous; flws 40–50 mm in diameter ***G. glaciale*** [B]
 - C. Lvs and stems glabrous or glabrate; flws 20–30 mm in diameter ***G. rossii*** [B]
- A. Terminal lft on basal lvs larger and different shaped than others
 - D. Terminal lft of basal lvs incised to base into 3 wedge-shaped segments ²⁹, terminal segment
only somewhat larger than main lateral lobes ²⁰; epicalyx bractlets present ^{25.73} ***G. aleppicum*** [B]
 - D. Terminal lft much larger than immediately lower lateral lfts ²⁰; upper stem lvs
3-lobed ¹⁷; epicalyx bractlets often absent ^{25.73} ***G. macrophyllum* var. *perincisum*** [M]

Potentilla

- A. Flw petals reddish purple to dark red *Comarum palustre* [B]*
- A. Flw petals white or cream or yellow
 - B. Basal lvs pinnate
 - C. Plant stem and infl glandular pubescent
 - D. Lfts obovate, serrate; plant distinctly glandular-villous *Drymocallis convallaria* [M]*
 - D. Lfts deeply incised; calyx lobes and sometimes stem with short glandular pubescence *P. litoralis* [M]
 - C. Plant stem and infl not distinctly glandular pubescent
 - E. Basal lfts more or less congested distally
 - F. Lvs tomentose below, with coarse hairs on veins and margins ¹⁷; infl 4–20 flwed, pedicels 5–50 mm long, hypanthium 4–6 mm wide, epicalyx bractlets linear to narrowly lanceolate ^{25,41} *P. rubricaulis* [B]
 - F. Lvs tomentose below mixed with long silky hairs ¹⁷; infl <10 flwed, pedicels 5–10 mm long, hypanthium 2–4 mm wide, epicalyx bractlets oblong to ovate ^{25,41} *P. pulchella* [B]
 - E. Basal lfts more widely spaced
 - G. Stems 5–15 cm tall; basal lvs with 9–18 crowded lfts, divided into 3–5 linear segments on each side *P. ovina* var. *ovina* [M]
 - G. Stem 10–60 cm tall; basal lvs usually with 5–9 uncrowded lfts
 - H. Basal lfts divided into elongate linear segments, margins prominently inrolled, tomentose abaxially ¹⁷ with long hairs common on veins ^{25,41} *P. bimundorum* [B]
 - H. Basal lfts toothed, teeth 2–3 times longer than wide, margins not prominently inrolled, nor abaxial surface distinctly tomentose
 - I. Flw petals shorter than sepals; lvs pinnate but appearing somewhat subdigitate, often with short and long hairs adaxially ³⁴, densely tomentose abaxially with long straight hairs ³⁴ *P. bipinnatifida* [M]
 - I. Flw petals equal to or longer than sepals; lvs distinctly pinnate, white tomentose abaxially *P. pensylvanica* [B]
 - B. Basal lvs trifoliate, subpalmate, or palmate, lfts not congested distally
 - J. Basal lvs with only 3 lfts
 - K. Plants annual or biennial; flw petals pale yellow and shorter than sepals *P. norvegica* [B]
 - K. Plant perennial; flw petals equal to or longer than sepals
 - L. Lfts cleft to base into 3 segments, with leaf-like linear lobes; flw petals 5–8 mm long *P. biflora* [B]
 - L. Lfts segments less deeply incised and not linear
 - M. Lft margins lobed to at least halfway to midvein
 - N. Lfts leathery, dark grayish green adaxially, tomentose and distinctly ribbed abaxially; flws 8–12 mm long *P. villosula* [B]
 - N. Lfts not leathery, nor grayish green adaxially and tomentose abaxially; flw petals 2–4 mm long *P. elegans* [B]
 - M. Lft margins less deeply lobed or toothed
 - ← ←
 - O. Epicalyx bractlets less than half as wide as sepals ^{25,41}
 - P. Leaf petioles with long, sparse to abundant spreading to ascending hairs, verrucose, short straight hairs often common, cottony hairs absent ^{25,41}; central lfts petiolule <5 mm long ^{25,41}; styles >1 mm long ^{25,41}; style papillate-swollen on lower 1/3 ^{25,41} *P. arenosa*
 - Q. Petioles with no or few short crisped hairs but with long verrucose hairs ^{25,41} ssp. *chamissonis* [B]+
 - Q. Petioles with common to abundant short and/or crisped hairs in addition to long verrucose hairs ^{25,41} ssp. *arenosa* [B]+
 - P. Leaf petioles generally lacking long hairs, cottony hairs abundant ^{25,41}; central lft subsessile or short petiolate ^{25,41}; style not papillate-swollen only at base
 - R. Epicalyx bractlets ≤0.6 mm wide ^{25,41}; styles not or somewhat papillate-swollen on lower 1/5 ^{25,41}; central lfts 3–12 teeth per side ^{25,41} *P. crebridens* ssp. *hemicryophila* [B]+
 - R. Epicalyx bractlets usually >0.6 mm wide ^{25,41}; style papillate-swollen at base, seldom higher ^{25,41}; central lfts ≤6 teeth per side ^{25,41} *P. nivea* [B]
 - O. Epicalyx bractlets half or more as wide as sepals ^{5, 25,41}
 - S. Abaxial leaf surface generally lacking cottony hairs ^{25,41}; styles <0.9 mm long ^{25,41} *P. hyparctica*

- T. Epicalyx bractlets narrowly oblong or ovate, 1–2.5 mm wide ^{25,41}; petiolule of central lfts 0–2 mm long ^{25,41}; stem to 12 cm tall ^{25,41}; mostly 1–3-flied ^{25,41} **ssp. hyparctica** [B]
- T. Epicalyx bractlets broadly oblong or ovate, 2–5 mm wide ^{25,41}; petiolule of central lfts typically 2–3 mm long ^{25,41}; stem to 25 cm tall ^{25,41}; 1–5 flied ^{25,41} **ssp. elatior** [B]+
- S. Abaxial leaf surface with relative continuous crisped cottony layer
 - U. Epicalyx bractlet red glands usually common ^{25,41}; leaf petiole long hairs common to abundant and verrucose ^{25,41}; styles strongly papillate-swollen on proximal 1/5 to 1/3 ^{25,41} **P. × tikhomirovii** [B]+
 - U. Epicalyx bractlets lacking red glands ^{25,41}; leaf petiole long hairs common and smooth ^{25,41}; styles papillate-swollen only on proximal 1/5 ^{25,41} except sometimes to 1/3 for *P. subgorodkovii*
 - V. Pistils with sparse to abundant, straight apical hairs **P. vulcanicola** [B]+
 - V. Pistils lacking apical hairs or rarely cottony
 - W. Plant typically <15 cm tall ^{25,41}; basal lvs <150 mm long ^{25,41} **P. subgorodkovii** [B]+
 - W. Plant typically <6 cm tall ^{25,41}; basal lvs <30 mm long ^{25,41} **P. subvahlana** [B]+
- J. Basal lvs palmate, palmate with trifoliate lvs, or trifoliate with pinnate lvs
 - X. Basal lvs distinctly palmate; styles >1.5 mm long, filiform to tapered ^{25,41}
 - Y. Basal lfts toothed above middle ^{29,30}, evenly incised halfway or more to mid-vein; adaxial leaf surfaces glaucous, long hairs often only on veins, distal teeth, and margins ^{25,41}; adaxial and abaxial surface similar, glabrous or pilose ^{25,41} **P. glaucophylla var. glaucophylla** [B]+
 - Y. Basal lfts toothed to base ²⁹, evenly or unevenly incised 1/4 to 3/4 of way to midvein ^{25,41}; adaxial and abaxial leaf surfaces usually strongly dissimilar, not glaucous, long hairs common ^{25,41}, tomentose below ²⁹ **P. gracilis**
 - Z. Abaxial leaf surface crisped-cottony hairs ^{25,41}; usually strongly dissimilar from adaxial surface ^{25,41} **var. gracilis** [M]
 - Z. Abaxial leaf surface variously pubescent but not crisped-cottony ^{25,41}, more or less similar to adaxial surface ^{25,41} **var. fastigiata** [M]+
 - X. Basal lvs not distinctly palmate; styles <1.5 mm long, conic-tapered to columnar ^{23, 25,41}
 - a. Calyx lacking glands or obscure ²³ **P. hudsonii** [M]
 - a. Calyx pubescent with glands ^{24,49}
 - b. Petals 6–6.5 mm long ⁴⁹; style not or only slight papillate-swollen proximally ⁴⁹ **P. psychrophila** [M]+
 - b. Petals <6 mm long; style notably papillate-swollen
 - c. Petals 1.5 times longer than sepals ^{25,41}; style papillate-swollen in proximal 1/4 to 1/3 **P. pulchella** [B]
 - c. Petals approximating sepal length; style papillate-swollen in proximal 1/2 to 3/4 ^{24, 25,41}
 - d. Basal lvs with some verrucose hairs ^{25,41}; infl pedicels typically >10 mm long **P. furcata** [B]*
 - d. Basal lvs lacking verrucose hairs ²⁴; infl pedicels <10 mm long ²⁴ **P. jepsonii var. kluanensis** [M]+

Rosa

- A. Flws yellow, white, or pink, pedicel glabrous not subtended by a bract ⁴⁷ **R. spinosissima** [X]+
- A. Flws pink, pedicel with bract near base ⁴⁷
 - B. Stem not densely armed and branches often bearing only infrastipular prickles **R. woodsii ssp. woodsii** [M]
 - B. Stems and branches densely bristled and with short terete prickles **R. acicularis**
 - C. Flw pedicels stipitate-glandular ⁴⁷ **ssp. acicularis** [B]
 - C. Flw pedicels glabrous ⁴⁷ **ssp. sayi** [B]+

Rubus

- A. Erect shrub and semi-woody in lower portion of stem (canes)
 - B. Canes and branches with prickles, eglandular or stipitate-glandular ^{25,1} **R. idaeus ssp. strigosus** [B]*
 - B. Canes and branches lacking prickles ^{11,41}; with long glandular hairs ²⁵ **R. alaskensis** [B]+
- A. Low herbaceous subshrub, lacking bristly prickles
 - C. Flws dioecious; lvs round-reniform, mostly 5-lobed **R. chamaemorus** [B]
 - C. Flws perfect; lvs 3-foliate or appearing 5-foliate

- D. Lvs appearing 5-foliate; flws white *R. pedatus* [B]
- D. Lvs trifoliate; flws pink or white
 - E. Stems 15–50 cm tall, long-tufted, from long trailing freely rooting stolons
 - F. Flw petals ≤ 10 mm long and ≤ 3 mm wide, white or pale pink ⁴⁷ *R. pubescens* [M]
 - F. Flw petals usually ≥ 15 mm long and to 7 mm wide, pink ⁴⁷ *R. $\times$ paracaulis* [M]+
 - E. Stems 3–30 cm tall, tufted, from a woody branching base; flws pink *R. arcticus*
 - G. Lvs 3-lobed ssp. *stellatus* [B]
 - G. Lvs trifoliate
 - H. Flws 1–3, usually overtopping lvs ssp. *arcticus* [B]
 - H. Flws usually 1, typically not overtopping lvs ssp. *acaulis* [M]

Sanguisorba

- A. Flw spikes cylindrical, < 13 cm long ²⁰, greenish white *S. stipulata* [B]*
- A. Flw spikes shorter (1–7 cm long), rounded, obtuse apically, reddish ²⁹
 - B. Stamens only slightly exceeding sepals; filaments filiform ²⁹ *S. officinalis* [B]
 - B. Stamens 2–3 times longer than sepals; filaments flattened ²⁹ *S. menziesii* [M]+

Sorbus

- A. Infl branches with rust-colored hairs ²⁹ *S. sitchensis* var. *sitchensis* [M]
- A. Infl branches lacking commonly occurring rust-colored hairs, usually white ²⁹
 - B. Winter buds glutinous, glabrous, or pilose; infl pedicels sparsely pilose with appressed hairs; styles 4–5 ²⁹ *S. scopulina* [M]
 - B. Winter buds abundantly white-villous; infl densely whitish lanate pubescence ²⁹; styles 2–3 ²⁹ *S. aucuparia* [X]*

RUBIACEAE

- A. Lvs usually 8 per whorl, if 6, flws greenish yellow ²⁰ *Galium spurium* [X]+
- A. Lvs usually 6 or fewer; flws white or greenish white
 - B. Lvs whorls of 6, broadly lanceolate, mucronate, 7–8 mm wide, 15 mm long *G. triflorum* [B]
 - B. Lvs whorls of 4–6, linear to oblanceolate, tips blunt to acute, typically narrower and more than twice as longer as broad
 - C. Plant stout, stiffly erect, tufted; lvs distinctly 3-veined abaxially *G. boreale* [B]
 - C. Plant weak and slender, often matted growth; lvs 1-veined
 - D. Corolla 4-lobed; flws in groups of 3 or more
 - E. Flws in groups of 3; fruit smooth ³⁴ *G. labradoricum* [M]+
 - E. Flws several in terminal cyme, spreading ⁴⁷; fruit rugose ²⁹ *G. palustre* [X]
 - D. Corollas 3-lobed; flws 1–3 in a cyme
 - F. Stem and leaf margins smooth *G. brandegeei* [B]
 - F. Stem and leaf margins retrorsely scabrous *G. trifidum*
 - G. Terminal portions of infl 3-flws ⁴⁵ ssp. *trifidum* [B]
 - G. Terminal portions of infl 1–2 flws ⁴⁵ ssp. *subbiflorum* [M]+

SALICACEAE

- A. Catkins erect-ascending; bracts entire or merely toothed ²⁹; winter buds covered by a single scale *Salix*
- A. Catkins soon pendulous; bracts lacerate ²⁹; winter buds covered by several scales *Populus*

Populus

- A. Petioles flat in cross-section *P. tremuloides* [M]
- A. Petioles round in cross-section
 - B. Carpel valves 2, glabrous ⁴⁷; 12–20 stamens per floret ⁴⁷ *P. balsamifera* [M]
 - B. Carpel valves 3, pubescent ⁴⁷; 40–60 stamens per floret ⁴⁷ *P. trichocarpa* [M]*

Salix ^{25,13}, except where indicated

- A. Dwarfed, prostrate trailing shrub, < 20 cm tall; typically in alpine and arctic environments
 - B. Pistillate flws with an abaxial and an adaxial nectary relative to capsule stipe; lvs orbicular, elliptic, or obovate
 - C. Lvs with embedded veins in a reticulate pattern adaxially, pale below, pubescent, 12–65 mm long; bracts tawny or dark red ¹⁷; styles 0.2–0.3 mm long *S. reticulata* [B]
 - C. Lvs lacking deeply embedded veins, glabrous below, 2–16 mm long; bracts usually brown; styles usually longer

- D. Largest medial lvs <17 mm long, with 2 pairs of secondary veins arising near base and arcing toward apex ***S. rotundifolia* ssp. *rotundifolia*** [B]
- D. Largest medial lvs 13–46 mm long, lacking such veins ***S. ovalifolia*** [B]
- B. Pistillate flws with 1 nectary, usually located adaxially relative to capsule stipe
- E. Pistils glabrous or nearly so
 - F. Branchlets densely woolly; lvs lemon green adaxially, coriaceous ¹⁷; leaf petiole 0–3 mm long; floral bracts tawny (tan) or greenish, often translucent ***S. setchelliana*** [B]
 - F. Branchlets glabrous to moderately pubescent; lvs thin; leaf petiole usually longer; floral bracts usually brown to blackish, not translucent
 - G. Leaf base cuneate or acute ¹⁰, styles 0.6–1.8 mm long; floral bracts black or dark brown; lvs elliptic to obovate ***S. sphenophylla*** [B]
 - G. Leaf base round; lvs usually broadly elliptic to circular; styles $\leq$ 1 mm long; floral bracts brown, green, or bicolor
 - H. Petioles 1–16 mm long; lvs 13–46 mm long, glabrous or pubescent abaxially; stigmas flat ***S. ovalifolia*** [B]
 - H. Petioles <6 mm long; lvs 2–16 mm long, glabrous on both sides; stigmas flat or cylindrical ***S. rotundifolia***
 - I. Pistillate catkins 3–15 flwed; leaf blades 5–16 mm long, petioles 0.5–5.5 mm long; stigma cylindrical **var. *rotundifolia*** [B]
 - I. Pistillate catkins 2–9 flwed; leaf blades 3–7 mm long; petioles <3 mm long; stigma flat **var. *dodgeana*** [B]
- E. Pistils pubescent, sometimes only on beak ¹⁰
 - J. Leaf blade margins glandular or finely glandular serrate ¹⁷ ***S. chamissonis*** [B]
 - J. Leaf blade margins entire, ciliate, or indistinctly toothed, glands absent
 - K. Lvs glaucous abaxially; lvs glossy and glabrous adaxially; pistillate nectary shorter than stipe; pistil often including refractive flattened hairs ***S. arctophila*** [B]
 - K. Lvs not or rarely glaucous abaxially; either glabrous or pubescent adaxially
 - L. Pistillate adaxial nectary shorter than or equal to stipe length; branches with marcescent lvs that become skeletonized ***S. phlebophylla*** [B]
 - L. Pistillate adaxial nectary equal to or longer than stipe length; branches lacking persistent skeletonized lvs
 - M. Lvs highly glossy and glabrous adaxially; style <0.8 mm long ***S. ovalifolia*** [B]
 - M. Lvs slightly glossy or pubescent adaxially; style 0.5–2.2 mm long
 - N. Pistil glabrous or patchy pubescent, especially on beak ***S. sphenophylla*** [B]
 - N. Pistil densely and continuous pubescent ¹⁰
 - O. Leaf petiole 2–35 mm long; leaf margin not ciliate, bearded apically; pistils reddish or tawny ¹⁰; branchlets densely, pubescent sometimes strongly glaucous ***S. arctica*** [B]
 - O. Leaf petiole 1–10 mm long; leaf margins ciliate; pistil pale reddish brown ¹⁰ to purplish brown ¹⁷; branchlets glabrous ***S. polaris*** [B]
 - A. Erect shrub usually >20 cm tall; typically in boreal, subalpine, and subarctic environments
 - P. Pistil glabrous
 - Q. Lvs linear to oblanceolate and 50–160 mm long, usually >5 times as long as wide
 - R. Lvs cuneate at base, typically 6.5–31 times as long as wide; petiole lacking glands; leaf margins spinulose-serrulate ***S. interior*** [M]
 - R. Lvs convex or rounded at base, typically 3–10 times as long as wide; petiole with glands; leaf margins not spinulose-serrulate
 - S. Abaxial leaf surface glabrous, not obviously glaucous; stipules absent or rudimentary ***S. serissima*** [M]+
 - S. Abaxial leaf surface glabrescent or pilose, sometimes glaucous; stipules usually present, foliaceous ***S. lasiandra***
 - T. Abaxial leaf surface not glaucous ***S. lasiandra* var. *caudata*** [M]+
 - T. Abaxial leaf surface glaucous **var. *lasiandra* var. *lasiandra*** [M]*
 - Q. Lvs broader and usually only 2–5 times as long as wide
 - U. Leaf petioles with pairs or clusters of glands ***S. lasiandra*** (see “S” couplet)
 - U. Leaf petioles lacking glands
 - V. Pistillate nectary about as long as or longer than pistil stipe, stipe 0.5–1.6 mm
 - W. Style >1.2 mm long; pistillate nectary much longer than stipe ***S. richardsonii*** [B]*
 - W. Style <1.2 mm long; pistillate nectary shorter or approximating stipe length
 - X. Leaf margins serrulate, serrate, or sinuate, abaxial surface glaucous and glabrous, adaxial surface dull, often pubescent including

- midvein; pistillate nectary equal to stipe length; pistil beak gradually tapering into style; anthers purple during yellow *S. pseudomonticola* [M]
- X. Leaf margins entire, abaxial surface glabrous; adaxial surface slightly glossy and glabrous; pistillate nectary equal to or longer than stipe length; pistil beak not tapering into style; anthers yellow *S. raupii* [M]
- V. Pistillate nectary shorter than pistil stipe
- Y. Pistil beak gradually tapering into style
- Z. Lvs abaxially not glaucous, moderately dense tomentose *S. commutata* [M]
- Z. Lvs abaxially glaucous, glabrous, or glabrescent
- a. Pistillate flowering branchlet 0.5–8 mm long, peduncle generally leafless¹⁷; adaxial leaf surface glaucous and midvein pilose to villous; stigma general flat; anthers purple turning yellow *S. pseudomonticola* [M]
- a. Pistillate flowering branchlet to 24 mm long, peduncle leafy⁴⁷; adaxial leaf surface sparsely pubescent or, if pilose, stigmas slender and cylindrical adaxial leaf surface nonglaucous; anthers yellow
- b. Adaxial midvein sparsely pubescent with short white and reddish hairs; stigma flat *S. farriae* [M]+
- b. Adaxial midvein pilose; stigma cylindrical *S. barclayi* [M]
- Y. Pistil beak not gradually tapering into style; style usually connate or partially so to about half their length
- c. Leaf adaxial surface glaucous and glabrous; anthers yellow *S. pedicellaris* [M]
- c. Leaf adaxial surface otherwise; anthers often purple turning yellow
- d. Leaf adaxial surface dull or only slightly glossy and at least sparsely pubescent *S. hastata* [B]
- d. Leaf adaxial surface glabrous
- e. Leaf adaxial surface glossy, abaxially glabrous
- f. Pistil stipe 0.6–1.7 mm long; nectary 0.2–0.4 mm long; lvs abaxially not glaucous; anthers purple but turning yellow *S. myrtillifolia* [M]
- f. Pistil stipe 1.8–3.5 mm long; nectary 0.3–0.7 mm long; lvs abaxially glaucous; anthers yellow *S. pyrifolia* [B]
- e. Leaf adaxial surface slightly glossy or dull, abaxially glabrous or pubescent;
- g. Lvs abaxially not glaucous; floral bracts retuse *S. pseudomyrsinites* [M]
- g. Lvs abaxially glaucous; floral bracts acute or round *S. prolixa* [M]
- P. Pistils pubescent
- h. Lvs linear, 6.5–31 times as long as wide; leaf adaxial surface densely villous or long-silky to glabrescent, margins spinulose-serrulate (2–5 teeth per cm) *S. interior* [M]+
- h. Lvs not linear, only 2–6 times as long as wide, margin not spinulose-serrulate
- i. Pistil stipe 3–5 mm long¹⁰, several times longer than nectaries; beak long and narrow¹⁷ *S. bebbiana* [B]
- i. Pistil stipe <2.7 mm long, usually 1–4 times longer than nectaries; beak not long and narrow
- j. Buds and stipules oily¹⁷; leaf margins prominently glandular *S. barrattiana* [M]
- j. Buds and stipules not oily; leaf margins not prominently glandular
- k. Catkins sessile or on very short peduncle, usually naked or with a few bracts²⁰
- l. Leaf margin glandular submarginally or epilaminally *S. scouleriana* [M]
- l. Leaf margins not glandular
- m. Leaf margin strongly revolute *S. alaxensis*
- n. Branchlets densely villous-woolly, weakly glaucous at most¹⁷. var. *alaxensis* [B]
- n. Branchlets strong glaucous or sparsely villous or glabrescent¹⁷. var. *longistylis* [B]
- m. Leaf margin slightly revolute or flat
- o. Lvs not highly glossy adaxially, often notably pubescent
- p. Pistil stipe 1.6–2.7 mm long; filaments glabrous or pubescent basally; pistil beak usually not tapering into style *S. discolor* [M]+
- p. Pistil stipe 0.3–2 mm long; filaments glabrous; pistil beak tapering into style *S. drummondiana* [M]
- o. Lvs glossy, glabrous, and not notably pubescent adaxially
- q. Style <0.5 mm long; leaf margin glandular serrulate¹⁰. *S. arbusculoides* [M]
- q. Styles 0.5–2 mm long; leaf margin not glandular
- r. Stipules linear, often persistent for 2–4 years,

- 3.5–14 mm long ¹⁷ *S. pulchra* [B]*
- r. Stipules narrowly elliptic, not persistent for more than 1 year, 0.8–2.8 mm long ¹⁷ *S. planifolia* [B]*
- k. Catkins on leafy peduncles ^{20,10}
- ← ←
- s. Leaf margins glandular; lvs glabrous and high glossy adaxially
- t. Lvs narrowly oblong to broadly obovate 14–45 mm long, apex typically acuminate or rounded ¹⁷; floral bracts <1.6 mm long; abaxial nectary absent; style <0.65 mm long *S. fuscescens* [B]
- t. Lvs narrowly oblong, lorate, 40–85 mm long, apex typically acute to acuminate ¹⁷; floral bracts >1.6 mm long; abaxial nectary present; style >0.8 mm long *S. maccalliana* [M]
- s. Leaf margins lacking glands; lvs not highly glossy adaxially
- u. Adaxial nectary equal to or longer than pistil stipe
- v. Lvs densely pubescent abaxially; floral bracts sparsely to moderately pubescent abaxially; flying branchlets 4–30 mm long *S. niphoclada* [B]*
- v. Lvs glabrous abaxially; floral bracts glabrous abaxially; flying branchlets 4–7 mm long *S. raupii* [M]
- u. Adaxial nectary often half or less as long as pistil stipe ¹⁷
- w. Lvs densely white-lanate abaxially, sparsely to moderately floccose adaxially ³⁴; styles red in life ³⁴; branchlets woolly, tomentose, or floccose *S. candida* [B]
- w. Lvs and branchlets lacking lanate or floccose pubescence
- x. Lvs with scattered ferruginous hairs abaxially and adaxially, especially when young ³⁴; lvs glabrescent or sparsely silky, hairs appressed to somewhat spreading abaxially; floral bracts 1–1.6 mm long, usually glabrous to sparsely pubescent abaxially *S. athabascensis* [M]
- x. Lvs without scattered ferruginous hairs; lvs densely villous to tomentose abaxially; floral bracts 1–3.4 mm long, pubescent abaxially *S. glauca*
- y. Stipules inconspicuous or rudimentary, if foliaceous, oblong, elliptic, or ovate, 1–10 mm long; lvs narrowly elliptic to obovate, margins entire or serrulate; branchlets sparsely villous or tomentose *var. villosa* [M]
- y. Stipules usually foliaceous, prominent, linear, narrowly elliptic or lanceolate, 2–17 mm long; lvs narrow oblong, oblanceolate, obovate to narrowly elliptic, margins entire; branchlets densely villous to glabrescent
- z. Branchlets becoming pilose or glabrescent; leaf apex usually acuminate, petiole 4–27 mm long; stamen filaments distinct, glabrous *var. acutifolia* [B]
- z. Branchlets densely villous; leaf apex acute, petiole 1–9 mm long; stamen filaments distinct or partly connate, glabrous or pubescent on proximal half *var. stipulata* [B]+

SANTALACEAE

- A. Flws in terminal cyme or panicle; fruit dry, nut-like *Comandra umbellata* ssp. *pallida* [M]
- A. Flws axillary, fruit red and juicy *Geocaulon lividum* [M]

SAXIFRAGACEAE

- A. Flw petals lacking; low delicate herb; flws ≥ 4 *Chrysosplenium*
- A. Flw petals present, or lacking, flws ≥ 5
- B. Flw petals laciniately lobed
- C. Stamens 10; lvs rounded reniform, cordate, obscurely lobed *Mitella nuda* [B]
- C. Stamens 5; lvs orbicular to reniform, with a deep basal sinus, crenate-dentate *Pectiantia pentandra* [M]*
- B. Flw petals not lobed or laciniate
- D. Stamens 5 *Boykinia richardsonii* [B]
- D. Stamens 10
- E. Lvs broad, thick, and evergreen; anthers dehiscent by broad, terminal openings ^{25,90} *Leptarrhena pyrolifolia* [B]
- E. Lvs thin and herbaceous; anthers dehiscent by longitudinal slits ^{25,90}
- F. Lvs usually basal ^{25,90}; flying stems usually leafless ^{25,90}; seeds ribbed ^{25,90} *Micranthes*
- F. Basal and cauline lvs present ^{25,90}; flying stem lvs reduced in size relative to basal lvs ^{25,90}; seeds smooth, tuberculate, or papillate ^{25,90} *Saxifraga*

Chrysosplenium

- A. Stamens 4; cauline lvs 1–4 ^{25,43}; rhizome slender ²⁹; calyx green; stem and petioles glabrous or with a few light-colored hairs (rarely brownish) ^{25,43} ***C. tetrandrum*** [B]
- A. Stamens 8; cauline lvs typically 1 or leafless ^{25,43}; rhizome thick ²⁹; calyx minutely purple-dotted ^{25,43}; stem and petioles usually with curly rust-colored hairs ⁴⁷ ***C. wrightii*** [B]

Micranthes

- A. Basal lvs orbicular or reniform, cordate; petiole long and narrow
 - B. Infl a compact panicle, spike-like; flws yellowish; petals 4–7 mm long ***M. spicata*** [B]*
 - B. Infl in capitate or corymb-like panicle; flws white or pink; petals to 4 mm long ***M. nelsoniana***
 - C. Lvs pubescent on both sides ²⁹; panicle with erect, short, purple- to brown glandular-tipped hairs ^{25,28}; leaf sinus shallow to deep, rarely closed ¹⁷; flws white ¹⁶ **var. *nelsoniana*** [B]*
 - C. Lvs glabrous on both sides ²⁹; panicle with tangled ^{25,28}, long, eglandular or small glandular tipped ⁴⁷, septate ²⁹; leaf sinus indistinct ¹⁶; flws white or tinged with pink ¹⁶
 - D. Largest lvs typically 6–12 toothed ²⁹, 2–5 cm wide ¹⁷; capsules 6–12 mm long ^{25,28}, cleft between valves closely appressed ¹⁶ **var. *carlottae*** [M]+
 - D. Largest lvs typically 12–18 toothed ²⁹, 1.5–3.8 cm wide ¹⁷; capsules 3–8 mm long ^{25,28}, cleft between valves obvious ¹⁶ **var. *persildiana*** [B]*
- A. Basal lvs otherwise or petiole short to indistinct, or winged
 - E. Infl spike-like with small dense clusters of flws, interrupted ***M. hieraciifolia*** [B]*
 - E. Infl not spike-like, generally racemose or paniculate
 - F. Sepals reflexed at least in mature flws
 - G. Leaf blade margin crenate-serrate to near base; lvs densely pubescent on both sides, with short, septate, tangled reddish brown hairs ^{25,28}, longer hairs on margin ²⁹ ***M. reflexa*** [B]*
 - G. Leaf blade apically toothed; lvs not densely pubescent on both sides
 - H. Filaments clavate or broadest in middle ***M. lyallii*** [M]*
 - H. Filaments linear ^{25,28}
 - I. Leaf blade margins 3–9 toothed ^{25,28}; infl 2–16 flwed ^{25,28}; flws white to cream or purplish, without spots ^{25,28} ***M. razshivinii*** [B]*
 - I. Leaf blade apex 1–3 toothed ^{25,28}; 2–5 or more flwed ^{25,28}; flws white, each petal with 1–2 basal yellow spots ^{25,28} ***M. foliolosa*** [B]*
 - F. Sepals not reflexed
 - J. Flw petals white but turning pink with age ³⁹; stem and infl with long, white to clear hairs, some purple tipped ³⁹ ***M. nivalis*** [B]*
 - J. Flw petals reddish to purple or pink ³⁹; stem pubescent different ³⁹
 - K. Stem with long tangled white and brown hairs ³⁹; infl racemose or paniculate in fruit ³⁹ ***M. rufopilosa*** [B]*
 - K. Stem glabrate below, with short multicellular, crisp white or short glandular hairs above ³⁹; infl corymbose in fruit ³⁹ ***M. tenuis*** [B]+

Saxifraga

- A. Lvs opposite and imbricated; plant matted with trailing branches and solitary purple flws on short leafy peduncles ***S. oppositifolia***
 - B. Flw peduncle >30 mm long ⁴⁷; lvs ≤5 mm long ⁴⁷, with several cilia, not densely imbricate ²⁹; sepal margins bristly-ciliate ^{25,29} **ssp. *oppositifolia*** [B]
 - B. Flw peduncle <10 mm ⁴⁷; lvs about 3 mm long ⁴⁷, with no or only 2–4 cilia, densely imbricate ²⁹; sepal margins glandular-ciliate ^{25,29} **ssp. *smalliana*** [B]
- A. Lvs alternate; plant with upright stem; flws yellow to white
 - C. Plant densely caespitose, forming hemispherical cushions; flying stems inconspicuous with a few scale-like lvs ⁴²; flws small, yellow, drying cream to brown ^{25,29} ***S. eschscholtzii*** [B]
 - C. Plant otherwise; flying stem leafy
 - D. Basal lvs not distinctly petioled; flws typically yellowish or with yellow spots
 - E. Flw petals white or cream-colored; lvs leathery, marcescent
 - F. Lvs elliptic to spatulate, ciliate margins, mucronate, petals clawed at base ... ***S. funstonii*** [B]*
 - F. Lvs narrowly cuneate, reddish, shiny, sharply 3-toothed and margins softly glandular-ciliate ^{25,29}; petals crawless ⁴² ***S. tricuspidata*** [M]
 - E. Flw petals yellow; lvs not marcescent
 - G. Plant with long flagellate naked stolon terminating with rooted offsets ***S. flagellaris* ssp. *setigera*** [B]

- G. Plant lacking such stolons
 - H. Basal and lower lvs petiolate, blades to 35 mm long, thin ^{25,29}; stem usually 1-flw, flw petals ≥ 7 mm long, bright yellow *S. hirculus* [B]
 - H. Basal and lower lvs lacking petioles ^{25,29}, small, often fleshy or leathery ^{25,29}; flw petals < 7 mm long
 - I. Plant coarse and matted; stems ≥ 3 flws, on stout leafy peduncles *S. aizoides* [M]
 - I. Plants small, delicate, loosely tufted or matted, with small solitary flws on a slender bracted peduncle
 - J. Flws usually solitary, petals bright yellow; basal lvs glabrous, margins entire *S. serpyllifolia* [B]
 - J. Flws > 1 per stem ^{25,29}; petals white to pale yellow, with yellow or red-spotted ^{25,29}; lvs margins with glandular ciliate ^{25,29} *S. cherlerioides* [B]+
- D. Basal lvs long-petioled, with reniform cordate or cuneate 3–5 lobed blades; flws white or pale pinkish
 - K. Bulbils present in infl or at base of flw stem
 - L. Infl of 1 terminal and functional flw; reddish or black bulbils in axils of upper stem lvs *S. cernua* [B]
 - L. Infl of functional flws; white bulbils usually present in axils of basal lvs
 - M. Flw petals 9–15 mm long; plant mostly green ^{25,29} *S. radiata* [B]
 - M. Flw petals usually < 6 mm long; plant mostly purplish ^{25,29} *S. rivularis* ssp. *arctolitoralis* [B]
 - K. Bulbils lacking
 - N. Lvs reniform to orbiculate in outline, distinctly 3–7 lobed
 - O. Flw petals equaling to 1.5 times longer than sepals ^{25,29} *S. hyperborea* [B]*
 - O. Flw petals 2–3 times longer than sepals ^{25,29} *S. rivularis* ssp. *arctolitoralis* [B]+
 - N. Lvs spatulate or obovate and usually 3–5 toothed or weakly lobed
 - P. Perennial, plant densely matted; lvs green; capsules 6–10 mm long *S. cespitosa* [B]
 - P. Biennial ^{25,29}, plant stem simple or tufted ^{25,29}; plant with small reddish purple basal rosette; capsules 3–5 mm long *S. adscendens* [M]*

SCROPHULARIACEAE

- A. Terrestrial; flws in dense terminal spike, yellow ³⁴; plant pubescent ³⁴ *Verbascum thapsus* [X]+
- A. Aquatic; flws solitary in leaf axial, pink to white ¹⁷; plant glabrous ³⁴ *Limosella aquatica* [B]

SELAGINELLACEAE

Selaginella

- A. Lvs flat, not bristle-tipped *S. selaginoides* [B]
- A. Lvs grooved on back, bristle-tipped *S. sibirica* [B]

TOFIELDIACEAE

- A. Stems glandular-pubescent, especially toward infl *Triantha glutinosa* [M]*
- A. Stems glabrous *Tofieldia*
 - B. Stems scapose, pale green; flws yellowish green *T. pusilla* [B]
 - B. Stem with 1 or more leafy bracts, dark-colored; flws purplish *T. coccinea* [B]

TYPHACEAE

- A. Pistillate flw or fruit a thick cylindrical spike *Typha latifolia* [B]
- A. Pistillate flws or fruit spherical
 - B. Staminate head 1; achene beak short or none
 - C. Achene short-beaked; pistillate heads separate from staminate head; lvs thin, to 8 mm wide ⁴⁷ *Sparganium natans* [B,M]*
 - C. Achene beakless; staminate head nearly contiguous with upper pistillate head; lvs thickish, typically < 5 mm wide ⁴⁷ *S. hyperboreum* [B]
 - B. Staminate heads usually ≥ 2 ; achene beak prominent
 - D. Stem lvs usually floating, limp, flat to rounded on back, not keeled ^{25,54}, typically ≤ 5 mm wide ⁴⁷; pistillate heads 10–20 mm wide ¹⁷, achene beak 1.5–2 mm long, straight ^{25,54}; staminate heads 2–4, contiguous ^{25,54} *S. angustifolium* [B]
 - D. Stem lvs and infl often emergent, stiff, sometimes floating, erect lvs keeled at least in part ^{25,54}, typically < 18 mm wide ^{25,54}; pistillate heads 16–35 mm wide, achene peak 2–4.5 mm long, straight to curved ^{25,54}; staminate heads 3–10, sometimes discontinuous ^{25,54} *S. emersum* [B]+

URTICACEAE

- A. Lvs alternate, entire; stinging hairs lacking *Parietaria pensylvanica* [M]
- A. Lvs opposite, toothed; stinging hairs present *Urtica*
 - B. Rhizomatous perennial; stipules >5 mm long *U. gracilis* ssp. *gracilis* [M]
 - B. Taprooted annual; stipules <5 mm long *U. urens* [X]

VALERIANACEAE

Valeriana

- A. Basal lvs pinnate with 8 or more lateral lobes ⁴⁷ *V. officinalis* [X]+
- A. Basal lvs undivided or with fewer lobes or lifts ⁴⁷ *V. dioica* ssp. *sylvatica* [M]
 - B. Stem lvs all pinnate; corolla 2–3.5 mm long
 - B. Stem lvs variously divided; corollas 4–8 mm long
 - C. Upper stem lvs distinctly petioled ²⁹; bractlets of infl ciliate *V. sitchensis* [M]
 - C. Upper stem lvs sessile, simple or 3-lobed ²⁹; bractlets of infl glabrous or only ciliate on at base ²⁹ *V. capitata* [B]

VIBURNACEAE

- A. Herb *Adoxa moschatellina* [B]
- A. Shrub
 - B. Lvs simple but often deeply 3-lobed *Viburnum edule* [B]
 - B. Lvs pinnate *Sambucus racemosa* [M]*

VIOLACEAE

Viola

- A. Plant with leafy stems
 - B. Stipules large and lacinate ⁴² *V. tricolor* [X]+
 - B. Stipules smaller and bract-like ⁴²
 - C. Flw petals yellow or white
 - D. Flw petals yellow *V. biflora* var. *biflora* [B]
 - D. Flw petals white, yellow at base *V. rugulosa* [M]+
 - C. Flw petals blue to violet
 - E. Flws large, 16–25 mm long *V. langsdorfii* [B]
 - E. Flws smaller, 5–15 mm long *V. adunca* var. *adunca* [B]
- A. Plant stemless
 - F. Flw petals white with purple veins *V. renifolia* [M]
 - F. Flw petals violet to lilac
 - G. Lvs strigose above *V. selkirkii* [B]
 - G. Lvs glabrous or puberulent above
 - H. Rhizomes thick; stolons absent *V. nephrophylla* [M]
 - H. Rhizomes slender; stolons often present
 - I. Pedicel bracts near middle ⁴²; basal lvs typically >2 when flwing ⁴², cordate-rotund to round-reniform ⁴⁷, round-toothed ²⁰; flws pinkish to white ⁴⁷; stipules green, sparsely ciliate on margins ⁴⁷ *V. palustris* [M]+
 - I. Pedicel bracts usually above middle ⁴²; basal lvs typically 2 when flwing ⁴², broadly ovate to round-reniform ⁴⁷, blunt-toothed ²⁰; flws commonly purplish ⁴⁷; stipules purplish, appearing gland-tipped ⁴⁷, margins not ciliate *V. suecica* [B]*

WOODSIACEAE

- A. Stipe not jointed near base, persistent and broken bases of various lengths *Woodsia scopulina* ssp. *scopulina* [M]
- A. Stipe jointed near base, persistent bases about same length
 - B. Fronds delicate, glabrous; stipes and rachises green or stramineous; rachises chaffless . . . *W. glabella* [B]
 - B. Fronds more or less firm; stipes and rachises brown; rachises chaffy at least toward base
 - C. Fronds hairy and usually chaffy below; stipes usually very chaffy *W. ilvensis* [B]
 - C. Fronds glabrous or glabrate, chaffless; stipes chaffless or with some deciduous scales . . . *W. alpina* [B]

REFERENCES

- 1 Anonymous. 2019. Murray's arctic locoweed. Yukon Conservation Data Centre, Whitehorse, YT. <https://yukon.ca/sites/default/files/env/env-murrays-arctic-locoweed.pdf> [accessed April 2025].
- 2 Anonymous. 2020. Minnesota Wildflowers – *Carex atherodes*. <https://www.minnesotawildflowers.info/grass-sedge-rush/few-seeded-sedge> [accessed February 2025].
- 3 Anonymous. 2025. Go botany – *Carex oligosperma*, *Carex rariflora*, and *Carex capillaris*. Native Plant Trust. <https://gobotany.nativeplanttrust.org> [accessed February 2025].
- 4 Adams, R.P. 2013. *Juniperus communis* var. *kelleyii*, a new variety from North America. *Phytologia* 95: 215–221.
- 5 Aiken, S.G., Dallwitz, M.J., Consaul, L.L., McJannet, C.L., Boles, R.L., Argus G.W., Gillett, J.M. et al. 2007. Flora of the Canadian Arctic Archipelago. <https://nature.ca/aaflora/data> [accessed January 2024 to January 2025].
- 6 Al-Shehbaz, I.A. 2003. Transfer of most North American species of *Arabis* to *Boechea* (Brassicaceae). *Novon* 13: 81–391. doi:10.2307/3393366
- 7 Al-Shehbaz, I.A. 2009. Two new North American species of *Draba* (Brassicaceae): *D. heilii* from New Mexico and *D. mulliganii* from Alaska. *Harv. Pap. Bot.* 14: 83–86. doi:10.3100/025.014.0112
- 8 Al-Shehbaz, I.A. 2016. *Draba bruce-bennettii* (Brassicaceae), a remarkable new species from Yukon territory, Canada. *Harv. Pap. Bot.* 21: 1–3. doi:10.3100/hpib.v21iss1.2016.n1
- 9 Al-Shehbaz, I.A., and Mulligan, G.A. 2013. New or noteworthy species of *Draba* (Brassicaceae) from Canada and Alaska. *Harv. Pap. Bot.* 18: 101–124. doi:10.3100/025.018.0203
- 10 Argus, G.A. 1973. The genus *Salix* in Alaska and the Yukon. *Publ. Bot.* 2. National Museums of Canada, Ottawa, ON.
- 11 Bailey, L.H. 1941. The genus *Rubus* in North America (north of Mexico). *Gentes Herbarum* 5: 30–31.
- 12 Barneby, R.C. 1963. Notes on *Oxytropis*. *Leaf. West. Bot.* 10: 21–24.
- 13 Benet-Pierce, N., and Simpson, M.G. 2014. The taxonomy of *Chenopodium desiccatum* and *C. nitens*, sp. nov. *J. Torrey Botanical Soc.* 141: 161–172. doi:10.3159/TORREY-D-13-00046.1
- 14 Best K.F., Looman, J., and Campbell, J.B. 1971. Prairie grasses identified and described by vegetative characteristics. *Publ.* 1413. Canada Department of Agriculture, Ottawa, ON.
- 15 Budd, A.C., and Best, K.F. 1964. Wild plants of the Canadian prairies. *Publ.* 983-1969. Canada Department of Agriculture, Ottawa, ON.
- 16 Calder, J.A., and Savile, D.B.O. 1960. Studies in Saxifragaceae, 62. *Saxifraga odontoloma* and *lyallii*, and North American subspecies of *S. punctata*. *Can. J. Bot.* 38: 409–435. doi:10.1139/b60-040
- 17 Cody, W.J. 2000. Flora of the Yukon Territory. NRC Press Ottawa, ON.
- 18 Coleman, R.A. 2018. The *Cypripedium*s of the United States and Canada: Part 1: The *parviflorum* complex. *Orchids* 11(July): 356–366.
- 19 Dillenberger, M.S., and Kadereit, J.W. 2014. Multiple origins and delimitation with plesiomorphic characters require a new circumscription of *Minuartia* (Caryophyllaceae). *Taxon* 63: 64–88. doi:10.12705/631.5
- 20 Douglas, G.W., Straley, G.B., Meidinger, D., and Pojar, J., eds. 1998–2002. Illustrated flora of British Columbia, British Columbia Ministry of Environment, Lands and Parks and Ministry of Forests, Victoria, BC.
- 21 Dugle, J.R. 1966. A taxonomic study of western Canadian species in the genus *Betula*. *Can. J. Bot.* 44: 929–1007. doi:10.1139/b66-106
- 22 Elven, R., ed. 2018–2024. *Bupleurum*. In *Panarctic flora*. <https://panarcticflora.org> [accessed March 2025].
- 23 Ertter, B. 2018. Two new North American *Potentilla* Sect. *Rubicaules* (Rosaceae). *Phytoneuron* 2018-2: 1–14.
- 24 Ertter, B. 2019. *Potentilla jepsonii* var. *kluanensis* (Rosaceae): A new variety from Yukon and Alaska to Washington. *Phytoneuron* 2019-15: 1–8.
- 25 Flora of North America Editorial Committee, eds. 1993+. *Flora of North America north of Mexico*. <http://www.efloras.org> and <https://floranorthamerica.org> [accessed October 2023 to October 2025].
 - 25.1 Alice, L.A., Goldman, D.H., Macklin, J.A., and Moore, G. (volume 9) *Rubus*.
 - 25.2 Al-Shahbaz, I.A. (volume 7) *Erysimum*.
 - 25.3 Al-Shahbaz, I.A. (volume 7) *Rorippa*.
 - 25.4 Al-Shehbaz, I.A. (volume 7) *Arabidopsis*.
 - 25.5 Al-Shehbaz, I.A. (volume 7) *Arabis*.
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 - 25.7 Al-Shehbaz, I.A. (volume 7) *Sisymbrium*.
 - 25.8 Al-Shehbaz, I.A. (volume 7) *Smelowskia*.
 - 25.9 Al-Shehbaz, I.A., and Windham, M.D. (volume 7) *Boechea*.
 - 25.10 Al-Shehbaz, I.A., Marhold, K., and Lihová, J. (volume 7) *Cardamine*.
 - 25.11 Al-Shehbaz, I.A., Windham, M.D., and Elven, R. (volume 7) *Draba*.
 - 25.12 Alverson, E.R. (volume 2) *Cryptogramma*.
 - 25.13 Argus, G.W. (volume 2) *Salix*.

- 25.14 Ball, P.W., and Reznicek, A.A. (volume 23) *Carex*.
- 25.15 Ball, P.W., and Wujek, D.E. (volume 23) *Eriophorum*.
- 25.16 Barkley, T.M., and Murray, D.F. (volume 20) *Tephrosieris*.
- 25.17 Barkworth, M.E. (volume 24) *Agropyron*.
- 25.18 Barkworth, M.E. (volume 24) *Deschampsia*.
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- 25.21 Barkworth, M.E., and Allred, K.W. (volume 24) *Anthoxanthum*.
- 25.22 Barkworth, M.E., and Anderton, L.K. (volume 24) *Glyceria*.
- 25.23 Barkworth, M.E., Campbell, J.J.N., and Salomon, B. (volume 24) *Elymus*.
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- 25.26 Brooks, R.E., and Clemants, S.E. (volume 22) *Juncus*.
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- 25.30 Clark, L.G., and Kellogg, E.A. (volume 24) Poaceae.
- 25.31 Clemants, S.E. (volume 4) Chenopodiaceae.
- 25.32 Clemants, S.E., and Mosyakin, S.L. (volume 4) *Chenopodium*.
- 25.33 Costea, M., Tardif, F.J., and Hinds, H.R. (volume 5) *Polygonum*.
- 25.34 Crins, W.J. (volume 23) *Trichophorum*.
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- 25.36 Darbyshire, S.J., and Pavlickf, L.E. (volume 24) *Festuca*.
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- 25.38 Dutton, B.E., Keener, C.S., Ford, B.A. (volume 3) *Anemone*.
- 25.39 Egger, J.M., Zika, P.F., Wilson, B.L., Brainerd, R.E., and Otting, N. (volume 17) *Castilleja*.
- 25.40 Elven, R., Murray, D.F., and Solstad, H. (volume 17) *Hippuris*.
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- 25.44 Freeman, C.C., and Reveal, J.L. (volume 5) Polygonaceae.
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- 25.57 Landolt, E. (volume 22) *Lemna*.
- 25.58 Les, C., and Haynes, R.R. (volume 22) *Stuckenia*.
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- 25.62 Mosyakin, S.L. (volume 4) *Corispermum*.
- 25.63 Mosyakin, S.L. (volume 5) *Rumex*.
- 25.64 Neson, G.L. (volume 20) *Erigeron*.
- 25.65 O'Kane, Jr., S.L. (volume 7) *Physaria*.
- 25.66 Packer, J.G., and Freeman, C.C. (volume 5) *Koenigia*.
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- 25.76 Semple, J.C., and Cook, R.E. (volume 20) *Solidago*.
- 25.77 Sheviak, C.J. (volume 26) *Platanthera*.
- 25.78 Shultz, L.M. (volume 19) *Artemisia*.
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- 25.92 Welsh, S.L. (volume 4) *Atriplex*.
- 25.93 Whittemore, A.T. (volume 3) *Ranunculus*.
- 26 Fuentes-Bazan, S., Uotila, P., and Borsch, T. 2012. A novel phylogeny-based generic classification for *Chenopodium* sensu lato, and a tribal rearrangement of Chenopodioideae (Chenopodiaceae). *Willdenowia* 42: 5–24. doi:10.3372/wi.42.42101
- 27 Gilman, A.V., and Testo, W.L. 2015. Use of gemma characteristics to identify North American "*Huperzia*" (Lycopodiaceae). *Am. Fern J.* 105: 145–161. doi:10.1640/0002-8444-105.3.145
- 28 Hitchcock, C.L., and Cronquist, A. 1973. *Flora of the Pacific Northwest*. University of Washington Press, Seattle, WA.
- 29 Hultén, E. 1968. *Flora of Alaska and neighbouring territories*. Stanford Press, Stanford, CA.
- 30 Klinkenberg, B., ed. 2021. *E-Flora BC: Electronic atlas of the Flora of British Columbia*. <https://ibis.geog.ubc.ca>. [accessed January 2024].
- 31 Knoke, D., and Giblin, D. 2025. Burke Herbarium image collection – *Polemonium occidentale*. [https://burkeherbarium.org/imagecollection/taxon.php?=&Polemonium occidentale](https://burkeherbarium.org/imagecollection/taxon.php?=&Polemonium%20occidentale) [accessed April 2025].
- 32 Lepage, E. 1976. Les bouleaux arbustifs du Canada and de L'Alaska. *Nat. Can.* 103: 215–233.
- 33 MacKinnon, A., Pojar, J., and Coupé, R. 1992. *Plants of northern British Columbia*. Lone Pine Publishing Vancouver, BC.
- 34 Moss, E.H. 1983. *Flora of Alberta*. 2nd ed. University of Toronto Press, Toronto, ON.
- 35 Mulligan G.A. and Munro, D.B. 1981. The biology of Canadian weeds. 48. *Cicuta maculata* L., *C. douglasii* (DC.) Coult. & Rose and *C. virosa* L. *Can. J. Plant Sci.* 61: 93–105. doi:10.4141/cjps81-012
- 36 Murray, D.F. 2015. Notes on *Eritrichium* (Boraginaceae) in North America II. *J. Bot. Res. Inst. Texas* 9: 311–315.
- 37 Murray, D.F. 2017. Notes on *Eritrichium* (Boraginaceae) in North America 62. Three new species of *Eritrichium*. *J. Bot. Res. Inst. Texas* 11: 19–23.
- 38 Murray, D.F., and Elven, R. 2011. *Polemonium villosissimum* (Polemoniaceae), an overlooked species in Alaska and Yukon Territory. *J. Bot. Res. Inst. Texas* 5: 19–24.
- 39 Murray, D.F., and Elven, R. 2015. *Micranthes rufopilosa* (Saxifragaceae) comb. nov.: an alpine species from Alaska and Yukon. *J. Bot. Res. Inst. Texas* 9: 7–10.
- 40 Porsild, A.E. 1939. Contributions to the flora of Alaska - *Melandrium macrospermum*. *Rhodora* 41(486): 225.
- 41 Porsild, A.E. 1951. Botany of southeastern Yukon adjacent to the Canol Road. National Museum of Canada Bull. 121. Canada Department of Resource Development, Ottawa, ON.
- 42 Porsild, A.E., and Cody, W.J. 1980. Vascular plants of continental Northwest Territories, Canada. National Museum of Canada, Ottawa, ON.
- 43 Pringle, J.S. 2013. Nomenclatural notes on North American *Gyandra* (*Centaureum* s. lat.) and *Lomatogonium* (Gentianaceae). *Rhodora* 115(961): 96–111. doi:10.3119/11-18
- 44 Pteridophyte Phylogeny Group. 2016. A community-derived classification for extant lycophytes and ferns. *J. Systematics and Evolution* 54: 563–603. doi:10.1111/jse.12229
- 45 Puff, C. 1976. The *Galium trifidum* group (*Galium* sect. *Aparinoides*, Rubiaceae). *Can. J. Bot.* 54: 1911–1925. doi:10.1139/b76-206
- 46 Sarvel, J. 1978. A synopsis of the fern genus *Gymnocarpium*. *Ann. Bot. Fenn.* 15: 101–106.
- 47 Scoggan, H.J. 1978. *The flora of Canada*. Publ. Bot. No. 7. National Museum of Canada, Ottawa, ON.
- 48 Skarpaas, O., Elven, R., and Nordal, I. 2004. Genetic variation and biogeography of *Mertensia maritima* (Boraginaceae). *Nord. J. Bot.* 24: 583–592. doi:10.1111/j.1756-1051.2004.4B01643.s

- 49 Soják, J. 2006. Two new American species of *Potentilla* (Rosaceae) (Notes on *Potentilla* XX62). *Thaiszia J. Bot.* 16: 93–97.
- 50 Stensvold, M.C., and Farrar, D.R. 2017. Genetic diversity in the worldwide *Botrychium lunaria* (Ophioglossaceae) complex, with new species and new combinations. *Brittonia* 69: 148–175. doi:10.1007/s12228-016-9455-z
- 51 Stensvold, M.C., Farrar, D.R., and Johnson-Groh, C. 2002. Two new species of moonworts (*Botrychium* subg. *Botrychium*) from Alaska. *Am. Fern J.* 92: 150–160. [https://doi.org/10.1640/0002-8444\(2002\)092\[016:ITIWAJ\]2.0.CO;2](https://doi.org/10.1640/0002-8444(2002)092[016:ITIWAJ]2.0.CO;2)
- 52 Strong, W.L. 2010. *Pinus contorta* var. *yukonensis* var. nov. (Pinaceae) from south-central Yukon, Canada. *Nord. J. Bot.* 28: 448–452. doi:10.1111/j.1756-1051.2010.00824.x
- 53 Strong, W.L., and Hills, L.V. 2006. Taxonomy and origin of present-day morphometric variation in *Picea glauca* (x *engelmannii*) seed-cone scales in North America. *Can. J. Bot.* 84: 1129–1141. doi:10.1139/B06-071
- 54 Taylor, T.M.C. 1956. The ferns and fern-allies of British Columbia. Department of Recreation and Conservation Handb. No. 12. British Columbia Provincial Museum, Victoria, BC.
- 55 Testo, W., Weston, A., and Gilman, A.V. 2016. *Huperzia continentalis* (Lycopodiaceae), a new species of gemmiferous firmoss separated from *Huperzia haleakalae*. *Syst. Bot.* 41: 894–901. doi:10.1600/036364416X693982
- 56 Thor, G. 1988. The genus *Utricularia* in the Nordic countries, with special emphasis on *U. stygia* and *U. ochroleuca*. *Nord. J. Bot.* 8: 213–225. doi:10.1111/j.1756-1051.1988.tb01713.x
- 57 Wagner, W.H., and Grant, J.R. 2002. *Botrychium alaskense*, a new moonwort from the interior of Alaska. *Am. Fern J.* 92: 164–170. doi:10.1640/0002-8444(2002)092[0164:BAANMF]2.0.CO;2
- 58 Wagner, W.H., and Wagner, F.S. 1986. Three new species of moonworts (*Botrychium* Subg. *Botrychium*) endemic in western Northern America. *Am. Fern J.* 76: 33–47. doi:10.2307/1547557
- 59 Wagner, W.H., and Wagner, F.S. 1994. Another widely disjunct, rare and local North American moonwort (Ophioglossaceae: *Botrychium* subg. *Botrychium*). *Am. Fern J.* 84: 5–10. doi:10.2307.1547552
- 60 Welsh, S.L. 1991. *Oxytropis* DC. – Names, basionyms, types, and synonyms – Flora North America Project. *Great Basin Nat.* 51: 337–396.
- 61 Wu, Z., and Raven, P.H. Editorial Committee co-chairs. 1994+. *Medicago*. In *Flora of China*. <http://www.efloras.org> [accessed December 2023].

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| <i>Apocynum</i> | 8 | <i>Cerastium</i> | 35 | <i>Eleocharis</i> | 45 | <i>Iris</i> | 53 |
| <i>Aquilegia</i> | 77 | <i>Ceratophyllum</i> | 5 | <i>Elyhordeum</i> | 67 | <i>Isoetes</i> | 53 |
| <i>Arabidopsis</i> | 24 | <i>Chamaedaphne</i> | 48 | <i>Elyleymus</i> | 67 | <i>Juncus</i> | 54 |
| <i>Arabis</i> | 24 | <i>Chamaenerion</i> | 57 | <i>Elymus</i> | 67 | <i>Juniperus</i> | 37 |
| <i>Aralia</i> | 11 | <i>Chamaerhodos</i> | 78 | <i>Empetrum</i> | 48 | <i>Kalmia</i> | 48 |
| <i>Arctagrostis</i> | 66 | <i>Chenopodiastrium</i> | 9 | <i>Epilobium</i> | 57 | <i>Koeleria</i> | 69 |
| <i>Arcteranthis</i> | 77 | <i>Chenopodium</i> | 10 | <i>Equisetum</i> | 47 | <i>Koenigia</i> | 73 |
| <i>Arctium</i> | 13 | <i>Cherleria</i> | 35 | <i>Eremogone</i> | 34 | <i>Krascheninnikovia</i> | 9 |
| <i>Arctophila</i> | 65 | <i>Chimaphila</i> | 48 | <i>Erigeron</i> | 16 | <i>Lactuca</i> | 11 |
| <i>Arctostaphylos</i> | 48 | <i>Chrysanthemum</i> | 12 | <i>Eriocoma</i> | 68 | <i>Lagotis</i> | 62 |
| <i>Arctous</i> | 48 | <i>Chrysosplenium</i> | 86 | <i>Eriogonum</i> | 72 | <i>Lamium</i> | 55 |
| <i>Arenaria</i> | 34 | <i>Cicuta</i> | 10 | <i>Eriophorum</i> | 45 | <i>Lappula</i> | 22 |
| <i>Argentina</i> | 79 | <i>Cinna</i> | 64 | <i>Eritrichium</i> | 21 | <i>Larix</i> | 62 |
| <i>Armeria</i> | 7 | <i>Circaea</i> | 57 | <i>Erucastrum</i> | 23 | <i>Lathyrus</i> | 50 |
| <i>Arnica</i> | 15 | <i>Cirsium</i> | 16 | <i>Erysimum</i> | 33 | <i>Lezna</i> | 11 |
| <i>Artemisia</i> | 15 | <i>Claytonia</i> | 56 | <i>Erythranthe</i> | 8 | <i>Lepidium</i> | 33 |
| <i>Aruncus</i> | 78 | <i>Clematis</i> | 76 | <i>Euphorbia</i> | 5 | <i>Leptarrhena</i> | 85 |
| <i>Askellia</i> | 16 | <i>Cnidium</i> | 10 | <i>Euphrasia</i> | 60 | <i>Leucanthemum</i> | 12 |
| <i>Asplenium</i> | 8 | <i>Cochlearia</i> | 22 | <i>Eurybia</i> | 12 | <i>Lewisia</i> | 56 |
| <i>Aster</i> | 12 | <i>Coeloglossum</i> | 59 | <i>Eutrema</i> | 33 | <i>Leymus</i> | 69 |
| <i>Astragalus</i> | 49 | <i>Collinsia</i> | 62 | <i>Fallopia</i> | 72 | <i>Limosella</i> | 87 |
| <i>Athyrium</i> | 20 | <i>Collomia</i> | 72 | <i>Festuca</i> | 68 | <i>Linaria</i> | 63 |
| <i>Atriplex</i> | 9 | <i>Comandra</i> | 85 | <i>Fragaria</i> | 79 | <i>Linnæa</i> | 56 |
| <i>Avena</i> | 66 | <i>Comarum</i> | 80 | <i>Fritillaria</i> | 55 | <i>Linum</i> | 6 |
| <i>Barbarea</i> | 23 | <i>Comastoma</i> | 52 | <i>Gagea</i> | 55 | <i>Lolium</i> | 69 |
| <i>Beckmannia</i> | 63 | <i>Coptidium</i> | 77 | <i>Gaillardia</i> | 12 | <i>Lomatogonium</i> | 52 |
| <i>Betula</i> | 20 | <i>Coptis</i> | 76 | <i>Galearis</i> | 59 | <i>Loniceria</i> | 34 |
| <i>Bidens</i> | 12 | <i>Corallorhiza</i> | 58 | <i>Galeopsis</i> | 55 | <i>Lotus</i> | 49 |
| <i>Bistorta</i> | 73 | <i>Corispermum</i> | 10 | <i>Galium</i> | 82 | <i>Luetkea</i> | 78 |
| <i>Blitum</i> | 10 | <i>Cornus</i> | 37 | <i>Gentiana</i> | 52 | <i>Lupinus</i> | 50 |

APPENDIX II. Concluded.

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|---------------------|-------|------------------------|------|-----------------------|------|-------------------------|------|
| <i>Luzula</i> | 54 | <i>Pectiantia</i> | 85 | <i>Rhododendron</i> | 49 | <i>Spiraea</i> | 78 |
| <i>Lycopodium</i> | 56 | <i>Pedicularis</i> | 60 | <i>Ribes</i> | 53 | <i>Spiranthes</i> | 59 |
| <i>Lysimachia</i> | 75 | <i>Penstemon</i> | 63 | <i>Rorippa</i> | 33 | <i>Stachys</i> | 55 |
| <i>Maianthemum</i> | 11 | <i>Persicaria</i> | 73 | <i>Rosa</i> | 81 | <i>Stellaria</i> | 36 |
| <i>Malaxis</i> | 59 | <i>Petasites</i> | 18 | <i>Rubus</i> | 81 | <i>Streptopus</i> | 55 |
| <i>Malva</i> | 5 | <i>Phacelia</i> | 53 | <i>Rumex</i> | 73 | <i>Stuckenia</i> | 75 |
| <i>Matricaria</i> | 13 | <i>Phalaris</i> | 70 | <i>Ruppia</i> | 74 | <i>Suaeda</i> | 9 |
| <i>Matteuccia</i> | 8 | <i>Phlegopteris</i> | 9 | <i>Sabulina</i> | 35 | <i>Subularia</i> | 22 |
| <i>Medicago</i> | 51 | <i>Phippsia</i> | 64 | <i>Sagina</i> | 35 | <i>Swertia</i> | 52 |
| <i>Melaocalyx</i> | 34 | <i>Phleum</i> | 70 | <i>Sagittaria</i> | 9 | <i>Symphyotrichum</i> | 18 |
| <i>Melilotus</i> | 50 | <i>Phlox</i> | 72 | <i>Salicornia</i> | 9 | <i>Symphytum</i> | 21 |
| <i>Mentha</i> | 55 | <i>Phyllodoce</i> | 48 | <i>Salix</i> | 82 | <i>Tanacetum</i> | 19 |
| <i>Menyanthes</i> | 8 | <i>Physaria</i> | 33 | <i>Sambucus</i> | 88 | <i>Taraxacum</i> | 19 |
| <i>Mertensia</i> | 22 | <i>Picea</i> | 62 | <i>Sanguisorba</i> | 82 | <i>Tephrosia</i> | 20 |
| <i>Micranthes</i> | 86 | <i>Pilosella</i> | 17 | <i>Saussurea</i> | 18 | <i>Thalictrum</i> | 78 |
| <i>Mitella</i> | 85 | <i>Pingicula</i> | 55 | <i>Saxifraga</i> | 86 | <i>Thiopyrum</i> | 72 |
| <i>Moehringia</i> | 34 | <i>Pinus</i> | 62 | <i>Sceptridium</i> | 57 | <i>Thlaspi</i> | 22 |
| <i>Moneses</i> | 47 | <i>Piptatheropsis</i> | 64 | <i>Scheuchzeria</i> | 3 | <i>Tofieldia</i> | 87 |
| <i>Montia</i> | 56 | <i>Plagiobothrys</i> | 21 | <i>Schizachne</i> | 65 | <i>Torreyochloa</i> | 65 |
| <i>Muhlenbergia</i> | 69 | <i>Plantago</i> | 63 | <i>Schoenoplectus</i> | 46 | <i>Townsendia</i> | 12 |
| <i>Myosotis</i> | 22 | <i>Platanthera</i> | 59 | <i>Scolochloa</i> | 65 | <i>Toxicodendron</i> | 6 |
| <i>Myrica</i> | 4 | <i>Poa</i> | 70 | <i>Scirpus</i> | 37 | <i>Tragopogon</i> | 20 |
| <i>Myriophyllum</i> | 53 | <i>Podagrostis</i> | 64 | <i>Scutellaria</i> | 55 | <i>Triantha</i> | 87 |
| <i>Najas</i> | 3 | <i>Podistera</i> | 11 | <i>Secale</i> | 64 | <i>Trichophorum</i> | 46 |
| <i>Neottia</i> | 59 | <i>Polemonium</i> | 72 | <i>Sedum</i> | 37 | <i>Trifolium</i> | 52 |
| <i>Nestotis</i> | 12/13 | <i>Polygonum</i> | 73 | <i>Selaginella</i> | 87 | <i>Triglochin</i> | 55 |
| <i>Noccaea</i> | 22 | <i>Polypodium</i> | 8 | <i>Senecio</i> | 18 | <i>Tripleurospermum</i> | 20 |
| <i>Nuphar</i> | 57 | <i>Polystichum</i> | 47 | <i>Shepherdia</i> | 47 | <i>Triticum</i> | 64 |
| <i>Nymphaea</i> | 57 | <i>Populus</i> | 82 | <i>Sibbaldia</i> | 79 | <i>Turritis</i> | 23 |
| <i>Odontarrhena</i> | 23 | <i>Potamogeton</i> | 74 | <i>Sibbaldia</i> | 65 | <i>Typha</i> | 87 |
| <i>Onobrychis</i> | 49 | <i>Potentilla</i> | 80 | <i>Silene</i> | 35 | <i>Urtica</i> | 88 |
| <i>Oplopanax</i> | 11 | <i>Primula</i> | 75 | <i>Sinapis</i> | 23 | <i>Utricularia</i> | 55 |
| <i>Oreomecon</i> | 61 | <i>Prunella</i> | 55 | <i>Sisymbrium</i> | 34 | <i>Vaccinium</i> | 49 |
| <i>Orthilia</i> | 47 | <i>Prunus</i> | 78 | <i>Sisyrinchium</i> | 53 | <i>Vahlodea</i> | 65 |
| <i>Orthocarpus</i> | 60 | <i>Psathyrostachys</i> | 67 | <i>Sium</i> | 10 | <i>Valeriana</i> | 88 |
| <i>Oryzopsis</i> | 64 | <i>Pseudocherleria</i> | 35 | <i>Smelowskia</i> | 34 | <i>Veratrum</i> | 56 |
| <i>Osmorhiza</i> | 10 | <i>Pseudoroegneria</i> | 67 | <i>Solidago</i> | 18 | <i>Verbascum</i> | 87 |
| <i>Oxybasis</i> | 9 | <i>Puccinellia</i> | 71 | <i>Sonchus</i> | 18 | <i>Veronica</i> | 63 |
| <i>Oxyria</i> | 72 | <i>Pulsatilla</i> | 76 | <i>Sorbaria</i> | 78 | <i>Viburnum</i> | 88 |
| <i>Oxytropis</i> | 51 | <i>Pyrola</i> | 48 | <i>Sorbus</i> | 82 | <i>Vicia</i> | 52 |
| <i>Packera</i> | 17 | <i>Ranunculus</i> | 77 | <i>Sparganium</i> | 87 | <i>Viola</i> | 88 |
| <i>Parietaria</i> | 88 | <i>Rheum</i> | 72 | <i>Spergularia</i> | 34 | <i>Wilhelmsia</i> | 34 |
| <i>Parnassia</i> | 37 | <i>Rhinanthus</i> | 60 | <i>Sphenopholis</i> | 65 | <i>Woodsia</i> | 88 |
| <i>Parrya</i> | 23 | <i>Rhodiola</i> | 37 | <i>Spinulum</i> | 56 | <i>Zannichellia</i> | 74 |

APPENDIX III: Updated taxon names relative to Cody (2000).

Updated name

Agoseris glauca var. *dasycephala*
Agropyron fragile
Alisma triviale
Alnus alnobetula ssp. *sinuata*
Andersonglossum boreale
Anemonastrum richardsonii
Anthoxanthum arcticum
Anthoxanthum hirtum
Anthoxanthum monticola ssp. *alpinum*
Anticlea elegans
Aphyllon fasciculatum
Arabidopsis lyrata ssp. *kamchatica*
Arabidopsis lyrata ssp. *petraea*
Arabis pycnocarpa var. *pycnocarpa*
Arctous alpina
Arctous rubra
Argentina anserina ssp. *anserina*
Argentina anserina ssp. *groenlandica*
Argentina subarctica
Armeria maritima ssp. *sibirica*
Arnica lanceolata ssp. *prima*
Artemisia hyperborean
Arnica ovata
Artemisia borealis ssp. *richardsoniana*
Artemisia hyperborea
Artemisia woodii
Askellia elegans
Askellia pygmaea
Asplenium viride
Astragalus laxmannii var. *robustior*
Astragalus laxmannii var. *tananaicus*
Athyrium cyclosorum
Atriplex dioica
Betula pendula ssp. *mandshurica*
Bistorta plumosa
Bistorta vivipara
Blitum capitatum ssp. *capitatum*
Blitum nuttallianum
Boechera calderi
Boechera drepanoloba
Boechera grahamii
Boechera lemmonii
Boechera lyallii
Boechera pauciflora
Boechera retrofracta
Boechera stricta
Botrychium pinnatum
Botrypus virginianus
Braya purpurascens
Callitriche heterophylla
Callitriche palustris
Canadanthus modestus
Capnoides sempervirens
Cardamine umbellata
Carex aquatilis var. *minor*
Carex atratiformis
Carex bigelowii ssp. *lugens*

Cody (2000) name

Agoseris glauca ssp. *scorzoneraefolia*
Agropyron sibiricum
Alisma plantago-aquatica var. *Americana*
Alnus crispa ssp. *sinuata*
Cynoglossum boreale
Anemone richardsonii
Hierochloë pauciflora
Hierochloë hirta ssp. *arctica*
Hierochloë alpina ssp. *alpina*
Zygadenus elegans
Orobanche fasciculata
Arabis kamchatica
Arabis media
Arabis hisuta var. *pycnocarpa*
Arctostaphylos alpina
Arctostaphylos rubra
Potentilla anserina ssp. *anserina*
Potentilla egedei
Potentilla anserina
Armeria maritima ssp. *arctica*
Arnica amplexicaulis
Artemisia furcata
Arnica diversifolia
Artemisia richardsoniana
Artemisia furcata
Artemisia rupestris ssp. *woodii*
Crepis elegans
Crepis nana
Asplenium trichomanes-ramosum
Astragalus adsurgens ssp. *robustior*
Astragalus adsurgens ssp. *viciifolius*
Athyrium filix-femina var. *cyclosorum*
Atriplex subspicata
Betula neoalaskana
Polygonum bistorta ssp. *plumosum*
Polygonum viviparum
Chenopodium capitatum
Monolepis nuttalliana
Arabis calderi
Arabis drepanoloba
Arabis divaricarpa var. *dacotica*
Arabis lemmonii
Arabis murrayi
Arabis columbiana
Arabis exilis
Arabis drummondii
Botrychium boreale ssp. *obtusilobum*
Botrychium virginianum var. *europaeum*
Braya glabella ssp. *purpurascens*
Callitriche anceps
Callitriche verna
Aster modestus
Corydalis sempervirens
Cardamine oligosperma ssp. *kamtschatica*
Carex aquatilis ssp. *stans*
Carex atratiformis ssp. *raymondii*
Carex lugens

APPENDIX III. Continued.

Updated name

Carex borealipolaris
Carex duriuscula
Carex fuliginosa
Carex kelloggii var. *kelloggii*
Carex micropoda
Carex myosuroides
Carex sabulosa
Carex simpliciuscula
Castilleja pallida var. *caudata*
Castilleja pallida var. *yukonis*
Cerastium fontanum ssp. *vulgare*
Chamaenerion angustifolium ssp. *angustifolium*
Chamaenerion latifolium
Chenopodium simplex
Cherleria arctica
Cherleria biflora
Cherleria obtusiloba
Cherleria yukonensis
Chimaphila umbellata ssp. *umbellata*
Claytonia sarmentosa
Claytonia scammaniana
Cnidium cnidiifolium
Cochlearia groenlandica
Comarum palustre
Comastoma tenellum
Coptidium lapponicum
Coptidium pallasii
Cornus sericea
Crucihimalaya bursifolia
Cryptogramma acrostichoides
Cryptogramma sitchensis
Dasiphora fruticosa
Dendrolycopodium dendroideum
Deschampsia cespitosa ssp. *septentrionalis*
Descurainia nelsonii
Diapensia obovata
Diphasiastrum alpinum
Diphasiastrum complanatum
Diphasiastrum sitchense
Drymocalis convallaria
Elymus lanceolatus ssp. *psammophilus*
Elymus violaceus
Epilobium ciliatum ssp. *glandulosum*
Eremogone capillaris var. *capillaris*
Eriocoma nelsonii ssp. *dorei*
Eriocoma richardsonii
Erigeron nivalis
Erigeron porsildii
Erythranthe guttata
Eurybia sibirica
Eutrema salsugineum
Fallopia convolvulus
Festuca viviparoides ssp. *viviparoides*
Gagea serotina var. *serotina*
Galearis rotundifolia
Galeopsis bifida
Gymnocarpium continentale
Halerpestes cymbalaria

Cody (2000) name

Carex sibirica
Carex stenophylla var. *eleocharis*
Carex misandra
Carex lenticularis var. *lipocarpa*
Carex pyrenaica
Kobresia myosuroides
Carex sabulosa ssp. *leiophylla*
Kobresia simpliciuscula
Castilleja caudata
Castilleja yukonis
Cerastium fontanum ssp. *triviale*
Epilobium angustifolium
Epilobium latifolium
Chenopodium simplex
Minuartia arctica
Minuartia biflora
Minuartia obtusiloba
Minuartia yukonensis
Chimaphila umbellata ssp. *occidentalis*
Montia sarmentosa
Montia scammaniana
Conioselinum cnidiifolium
Cochlearia officinalis ssp. *arctica*
Potentilla palustris
Gentianella tenella
Ranunculus lapponicus
Ranunculus pallasii
Cornus stolonifera
Halimolobos mollis
Cryptogramma crispa ssp. *acrostichoides*
Cryptogramma crispa ssp. *sitchensis*
Potentilla fruticosa ssp. *floribunda*
Lycopodium dendroideum
Deschampsia brevifolia
Descurainia pinnata var. *nelsonii*
Dispensia lapponica ssp. *obovata*
Lycopodium alpinum
Lycopodium complanatum
Lycopodium sitchense
Potentilla arguta ssp. *convallaria*
Elymus calderi
Elymus trachycaulus ssp. *violaceus*
Epilobium glandulosum
Arenaria capillaris
Stipa nelsonii ssp. *dorei*
Stipa richardsonii
Erigeron acris ssp. *debilis*
Erigeron grandiflorus ssp. *arcticus*
Mimulus guttatus
Aster sibiricus
Thellungiella salsuginea
Polygonum convolvulus
Festuca vivipara ssp. *glabra*
Lloydia serotina
Amerorchis rotundifolia
Galeopsis tetrahit ssp. *bifida*
Gymnocarpium jessoense ssp. *parvulum*
Ranunculus cymbalaria

APPENDIX III. Continued.

Updated name

Hedysarum americanum
Heracleum maximum
Hesperostipa comata ssp. *comata*
Hulteniella integrifolia
Huperzia selago
Juncus balticus ssp. *ater*
Kalmia procumbens
Koeleria spicata
Koenigia alaskana var. *alaskana*
Krascheninnikovia lanata
Leucanthemum vulgare
Linnaea borealis ssp. *longiflora*
Lolium arundinaceus
Lolium multiflorum
Luzula kjellmaniana
Lycopodium lagopus
Lysimachia europaea
Lysimachia latifolia
Lysimachia maritima
Matricaria discoidea
Medicago sativa ssp. *falcata*
Melanocalyx uniflora
Micranthes foliolosa
Micranthes hieraciifolia
Micranthes lyallii
Micranthes nelsoniana var. *nelsoniana*
Micranthes nelsoniana var. *porsildiana*
Micranthes nivalis
Micranthes razshivinii
Micranthes reflexa
Micranthes rufopilosa
Micranthes spicata
Myosotis asiatica
Neottia borealis
Neottia cordata
Nestotus maclearii
Noccaea arctica
Odontarrhena obovatum
Oreomecon cornwallisensis
Oreomecon keelei
Oreomecon lapponica
Oreomecon mcconnellii
Oreomecon nudicaulis ssp. *americana*
Oreomecon radicata ssp. *radicata*
Oreomecon walpolei
Oxybasis rubra var. *rubra*
Oxytropis borealis var. *viscida*
Packera heterophylla
Packera hyperborealis
Packera indecora
Packera ogtorukensis
Packera pauciflora
Packera paupercula
Packera streptanthifolia
Pectiantia pentandra
Pedicularis parviflora
Persicaria amphibia var. *stipulacea*
Persicaria lapathifolia

Cody (2000) name

Hedysarum alpinum
Heracleum lanatum
Stipa comata
Chrysanthemum integrifolium
Lycopodium selago
Juncus balticus var. *littoralis*
Loiseleuria procumbens
Trisetum spicatum
Polygonum alaskanum
Eurotia lanata
Chrysanthemum leucanthemum
Linnaea borealis ssp. *Americana*
Festuca arundinaceus
Lolium perenne ssp. *perenne*
Luzula arctica ssp. *latifolia*
Lycopodium clavatum var. *monostachyon*
Trisentalis europaea
Trisentalis borealis ssp. *latifolia*
Glaux maritima
Matricaria matricarioides
Medicago falcata
Campanula uniflora
Saxifraga foliolosa
Saxifraga hieraciifolia
Saxifraga lyallii ssp. *hultenii*
Saxifraga nelsoniana var. *nelsoniana*
Saxifraga nelsoniana var. *porsildiana*
Saxifraga nivalis
Saxifraga razshivinii
Saxifraga reflexa
Saxifraga rufopilosa
Saxifraga spicata
Myosotis alpestris ssp. *asiatica*
Listera borealis
Listeria cordata
Haplopappus maclearii
Thlaspi arcticum
Alyssum americanum
Papaver radicum ssp. *polare*
Papaver macounii ssp. *discolor*
Papaver lapponicum
Papaver mcconnellii
Papaver nudicaule ssp. *americanum*
Papaver radicum ssp. *radicum*
Papaver walpolei
Chenopodium rubrum
Oxytropis viscida
Senecio cymbalaria
Senecio hyperborealis
Senecio indecorus
Senecio ogtorukensis
Senecio pauciflorus
Senecio pauperculus
Senecio streptanthifolius
Mitella pentandra
Pedicularis macrodantis
Polygonum amphibium ssp. *laevimarginatum*
Polygonum lapathifolium

APPENDIX III. Continued.

Updated name

Petasites frigidus var. *sagittatus*
Physaria arctica
Physaria calderi
Picea albertiana var. *albertiana*
Picea albertiana var. *porsildii*
Piptatheropsis pungens
Poa interior
Polemonium villosum
Polygonum aviculare ssp. *buxiforme*
Polygonum humifusum ssp. *caurianum*
Populus trichocarpa
Potentilla furcata
Primula frigida
Primula pauciflora var. *pauciflora*
Primula pumila
Pseudocherleria macrocarpa
Pseudoroegneria spicata
Puccinellia distans ssp. *hauptiana*
Puccinellia nutkaensis
Puccinellia tenella ssp. *langeana*
Puccinellia vahlana
Pulsatilla nuttalliana
Ranunculus arcticus
Rhododendron groenlandicum
Rhododendron tomentosum
Rhodiola integrifolia ssp. *integrifolia*
Rubus idaeus ssp. *strigosus*
Rumex fueginus
Rumex triangulivalvis
Sabulina dawsonensis
Sabulina elegans
Sabulina rossii
Sabulina rubella
Sabulina stricta
Salix lasiandra var. *lasiandra*
Salix niphoclada
Salix planifolia
Salix pulchra
Salix richardsonii
Sambucus racemosa
Sanguisorba stipulata
Saxifraga adscendens
Saxifraga funstonii
Saxifraga hyperborea
Saxifraga rivularis
Sceptridium multifidum
Schoenoplectus pungens
Schoenoplectus tabernaemontani
Sibirotrisetum sibiricum ssp. *sibiricum*
Silene ostenfeldii
Solidago glutinosa
Solidago lepidota var. *salebrosa*
Sorbus aucuparia
Sparganium natans
Spinulum annotinum
Spiraea stevenii
Stuckenia pectinata
Stuckenia vaginata
Subularia aquatica

Cody (2000) name

Petasites sagittatus
Lesquerella arctica ssp. *arctica*
Lesquerella arctica ssp. *calderi*
Picea glauca var. *albertiana*
Picea glauca var. *porsildii*
Oryzopsis pungens
Poa nemoralis
Polemonium acutiflorum
Polygonum buxiforme
Polygonum caurianum
Populus balsamifera subsp. *trichocarpa*
Potentilla rubricaulis
Dodecatheon frigidum
Dodecatheon pauciflorum
Primula eximia
Minuartia macrocarpa
Elymus spicatus
Puccinella hauptiana
Puccinella grandis
Puccinella langeana
Colpodium vahlianum
Pulsatilla ludoviciana
Ranunculus pedatifidus ssp. *affinis*
Ledum groenlandicum
Ledum decumbens
Rhodiola rosea ssp. *intergrifolia*
Rubus idaeus
Rumex maritimus ssp. *fueginus*
Rumex salicifolius ssp. *triangulivalvis*
Minuartia dawsonensis
Minuartia elegans
Minuartia rossii
Minuartia rubella
Minuartia stricta
Salix lucida ssp. *lasiandra*
Salix brachycarpa ssp. *niphoclada*
Salix planifolia ssp. *planifolia*
Salix planifolia ssp. *pulchra*
Salix lanata ssp. *richardsonii*
Sambucus racemosa ssp. *pubens*
Sanguisorba canadensis ssp. *latifolia*
Saxifraga adscendens ssp. *oregonensis*
Saxifraga bronchialis ssp. *funstonii*
Saxifraga rivularis
Botrychium multifidum var. *multifidum*
Scirpus pungens
Scirpus validus
Trisetum sibiricum ssp. *sibiricum*
Silene taimyrensis
Solidago simplex
Solidago canadensis var. *salebrosa*
Sorbus sitchensis
Sparganium minimum
Lycopodium annotinum
Spiraea beauverdiana
Potamogeton pectinatus
Potamogeton vaginatus
Subularia aquatica ssp. *americana*

APPENDIX III. Concluded.

Updated name

Symphyotrichum boreale
Symphyotrichum ciliatum
Symphyotrichum ciliolatum
Symphyotrichum falcatum var. *falcatum*
Symphyotrichum yukonense
Taraxacum phymatocarpum
Tephrosia frigida
Tephrosia kjellmannii
Tephrosia palustris
Tephrosia yukonensis
Toxicodendron radicans var. *rydbergii*
Trientalis glutinosa
Trichophorum alpinum
Trichophorum cespitosum
Trichophorum pumilum
Tripleurospermum inodorum
Turritis glabra
Vahlodea atropurpurea
Veronica alaskensis
Viola suecica

Cody (2000) name

Aster borealis
Aster brachyactis
Aster ciliolatus
Aster falcatus
Aster yukonensis
Taraxacum lyratum
Senecio atropurpureus ssp. *frigidus*
Senecio kjellmannii
Senecio congestus
Senecio yukonensis
Rhus radicans
Tofieldia glutinosa
Scirpus hudsonianus
Scirpus cespitosus ssp. *austriacus*
Scirpus rollandii
Matricaria perforata
Arabis glabra
Vahlodea atropurpurea ssp. *latifolia*
Synthyris borealis
Viola epipsila ssp. *repens*

APPENDIX IV: Definitions of selected terms and abbreviations not included in Cody (2000).

Abaxial – the side facing away from stem ²⁸

Adaxial – the side facing toward stem ²⁸

[B] – Beringian resident

[E] – Yukon endemic that may or may not have been present in Beringia

Epicalyx – a series of sepal-like appendages associated with the calyx ³⁴

Flw – flower(s), flower(ed), flower(ing)

Free-scale – $\frac{[(\text{total cone-scale length from base of seeds} - \text{seed wing and seed length}) / \text{total cone-scale length from base of seeds}]}{100}$ ⁵³

Gemmae – bud-like asexual propagules, usually borne in leaf-axils ³⁴

Infl – inflorescence

Lft(s) – leaflet(s)

Lvs – leaves, includes both blade and petiole

[M] – postglacial migrant that likely resided south of 49°N latitude in ice-free areas during glaciation

Malpighiaceae hairs – hairs attached by at their middle ³⁴

Medial blade – normal sized leaves ^{25,13}

Septate-nodulose – divided by partitions, often between veins ³⁴

Sporophore – fertile portion of plant ⁵⁸

ssp. – subspecies, usually a geographically separate taxon relative to another subspecies

Tepal – outer whorl(s) of sepals

Trophophore – photosynthetic portions of a blade ⁵¹

var. – variety, a taxon below subspecies, geographically sympatric with other varieties

[X] – an anthropogenically introduced taxa

+ – indicates a new Yukon taxon relative to Cody (2000) when occurring after a taxon name

* – indicates an updated taxon name, see Appendix III for name used by Cody (2000)