

# Calochortiana

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*Sphaeromeria ruthiae* or *Artemisia ruthiae* (Ruth's chickensage), a rare endemic of Zion National Park and vicinity in southern Utah. Illustration by Kaye Thorne.

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# Flora of Zion National Park

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**Abstract:** Nearly 1100 vascular plant taxa (full species and subspecies/varieties) have been documented in Zion National Park since its establishment in 1909. Within the Colorado Plateau ecoregion, Zion has the third largest flora of any national park or monument, despite its relatively modest size (148,000 acres). The high species richness of the park is a result of its location near the juncture of the Colorado Plateau, Great Basin, Rocky Mountain, and Mojave Desert floristic regions. Additional diversity comes from species that are endemic to the Zion area (44 taxa) and recent introductions by humans (140 taxa). This paper includes a key to the 103 plant families currently recognized in Zion National Park (based on the 2009 APG III classification) and keys to each genus and species. Additional data on abundance, growth habit, general habitat, phenology, and synonyms are provided after each species entry in the key. An appendix includes a summary of taxonomic changes made since the 2009 Fertig and Alexander annotated checklist of the park.

## Introduction

Zion National Park was established in July 1909 by President William Howard Taft to preserve the area's magnificent scenery and rich human history, and to promote tourism in southern Utah (Figure 1). Of course the real value of the park is its incredible diversity of plant species. Currently, 1085 vascular plant species and varieties have been documented in the park (and more continue to be added each year). Zion National Park has greater species richness than any other park or monument in Utah, and is third in the Colorado Plateau after Grand Canyon National Park and Grand Canyon Parashant National Monument (Fertig 2010a). The great diversity of plant species found in Zion can be attributed to the park's location at the junction of four major floristic regions: the Colorado Plateau, Mohave Desert, Great Basin, and Rocky Mountains. The richness of the flora is also enhanced by a high degree of local endemism (species found only in Zion and the immediate area) and the introduction of new species through the intentional or unintentional actions of humans.

Differentiating between all of the plant species found in Zion can be difficult. The following set of dichotomous keys are a tool for unlocking the mystery of the park's flora. The first key is for determining the plant family to which a species belongs. The second is for identifying genera and species within families. I have attempted to use non-technical language as much as possible, but some technical jargon is unavoidable. Readers should consult a glossary of botanical terms, such as the excellent illustrated manual of Harris and Harris (1994) for help with unfamiliar words. Following each species is a brief synopsis of its growth form, abundance in the park, habitats, flowering period, synonyms, and other information. Additional data

on each species are available in the annotated checklist of the park (Fertig and Alexander 2009) and recent updates (Fertig et al. 2012).

These references and an earlier draft key to the flora of Zion (Fertig 2012) followed the nomenclature and family classification of Welsh et al. (2008). For this flora, I have adopted the revised family classification of the Angiosperm Phylogeny Group (APG III 2009). APG III is a two-decades long effort by an international team of plant systematists to use modern molecular tools to deduce the evolutionary history of all vascular plants. A number of long-standing families have been reshuffled based on the findings of APG III, such as the Chenopodiaceae, Hydrophyllaceae, Liliaceae, Scrophulariaceae, and many smaller families (APG III 2009). I have adopted many other recent changes in genus and species names following recent volumes of the *Flora of North America* (Barkworth et al. 2003, 2007; *Flora of North America* Editorial Committee 1993, 2002b, 2003, 2005, 2006a, 2006b, 2006c, 2009, 2010, 2012, 2015), the *Intermountain Flora* (Holmgren et al. 2012), and other literature (Nesom 2012a, 2012b, 2013 2014, 2015, Wagner et al. 2007, 2013). All of the changes made in the key are summarized in Appendix 1.

Keying plants is a lot like learning a foreign language. Practice is essential – no one learns a complete flora in two hours. The more species and terms that you learn, the easier it becomes to identify new species. Some gear is necessary too – especially a hand lens and a metric ruler. Don't be afraid to dig into the plant either – as some important characteristics may not be immediately visible (such as seed features). Also, nothing beats comparing a mystery plant with illustrations, photos, or herbarium specimens. The important thing is to have fun as you learn the species – and get outside to see them in nature!

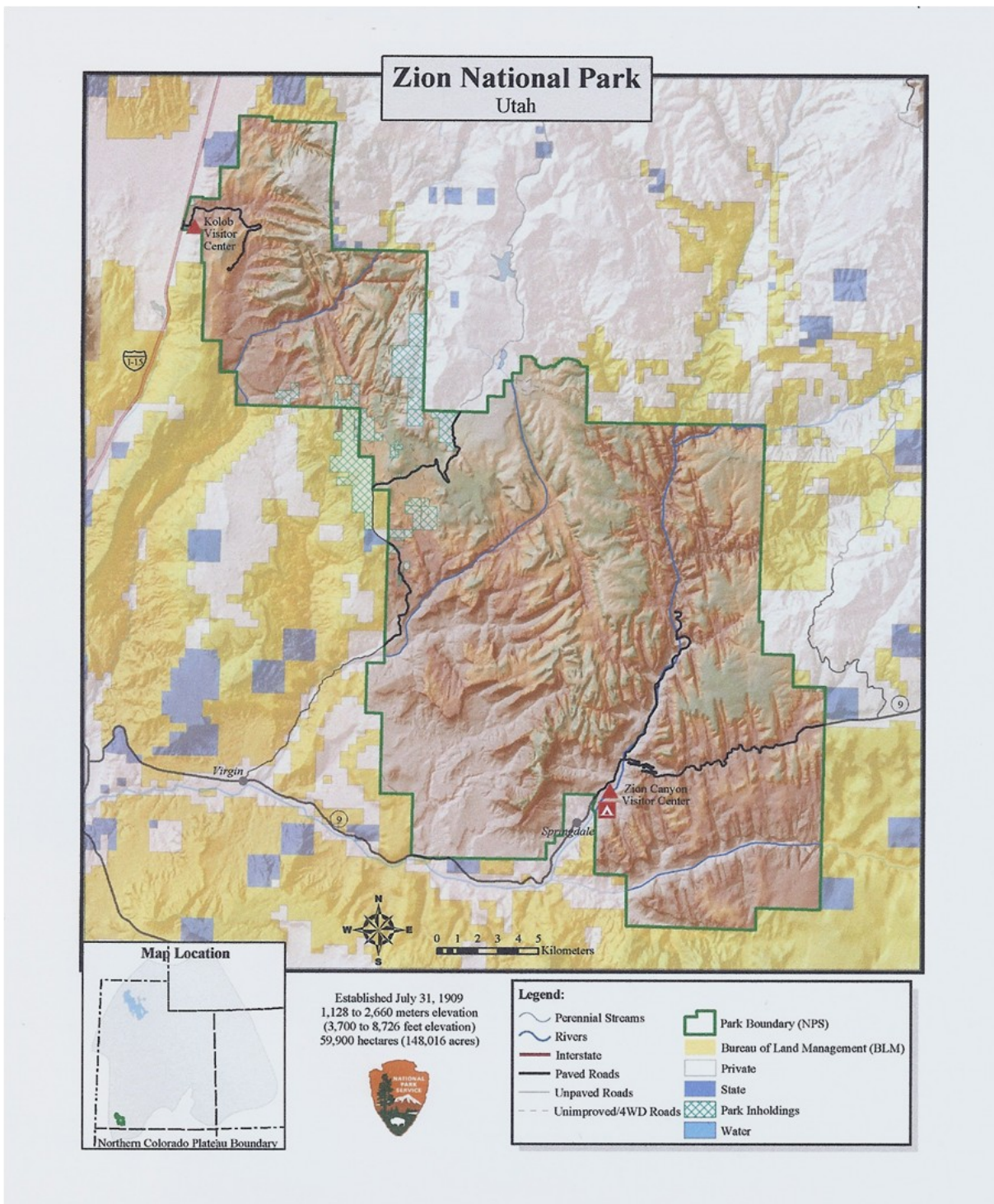


Figure 1. Location of Zion National Park Washington, Kane, and Iron counties, Utah. Map created by Aneth Wight of NCPN (derived from Fertig and Alexander 2009).

## I. Key to Plant Families of Zion National Park

1. Plants without flowers and lacking woody cones; reproduce by spores located on leaf undersides, leaf axils, or in fleshy apical cones; plants all herbaceous; Ferns and Fern Allies
  2. Stems grooved lengthwise and jointed at nodes; spores in terminal, fleshy cones . . . . . **Equisetaceae** (horsetails)
  2. Stems not grooved lengthwise or jointed at nodes; spores in leaf axils or underside of leaf surface
    3. Plants moss-like, leaves simple and needle-like; spores in leaf axils . . . . . **Selaginellaceae** (spikemosses)
    3. Plants fern-like, leaves compound or pinnately lobed; spores on underside of leaf surface; Ferns
      4. Spore clusters (sori) near the leaflet margins, appearing elongate, usually at least partially covered by the in-rolled or curled leaflet margins (may be obscured by dense hairs in *Cheilanthes*)
        5. Leaves and rhizomes with hairs but lacking broad, membranous scales; leaf blades leathery, 2-3 times pinnately compound, triangular; petioles green or yellow . . . . . **Dennstaedtiaceae** (bracken ferns)
        5. Leaves or rhizomes with broad, membranous scales; leaf blades thin-textured to leathery, 1-3 times innately compound, linear, curved-spreading, or triangular; petioles usually reddish-brown, purplish, or black . . . . . **Pteridaceae** (lip ferns)
      4. Sori on or along veins between leaflet margin and midrib, mostly round in outline; leaflet margins usually flat, rarely involved or curled
        6. Sori not covered by a membranous or scale-like indusium; leaves once-pinnately compound, leathery . . . . . **Polypodiaceae** (polypody ferns)
        6. Sori covered by a membranous indusium, scales, hairs, or contained within a bladderly sack (at least at the base when fresh); leaves 1-3 times pinnately compound, thin-textured to leathery
          7. Sori elongate, with a flap-like indusium . . . . . **Aspleniaceae** (spleenworts)
          7. Sori round, indusium shield-like, kidney-shaped, hood-like, cup-shaped, star-like, or absent . . . . . **Dryopteridaceae** (wood ferns)
1. Plants with flowers or with woody cones (cones fleshy in *Juniperus*); reproduce by seeds located in fruits or cones; plants herbaceous or woody; Angiosperms and Gymnosperms
  8. Flowers lacking; seeds and ovules exposed on scales of woody or papery cones or embedded in fleshy berry-like cones (*Juniperus*); evergreen trees or shrubs with needle-like or scale-like leaves or grooved green stems (*Ephedra*); Gymnosperms
    9. Stem branches grooved and jointed, green or bluish-green and photosynthetic; leaves tiny, scale-like, grayish-brown; ovules and seeds exposed in papery cones . . . . . **Ephedraceae** (Mormon teas)
    9. Stem branches not grooved or jointed or photosynthetic; leaves scale-like and green or needle-like; ovules and seeds in woody cones or fleshy and berry-like
      10. Leaves scale-like and opposite or needle-like and whorled; seeds fleshy and berry-like (*Juniperus*) or woody (*Cupressus*) . . . . . **Cupressaceae** (cypresses and junipers)
      10. Leaves needle-like, spirally arranged or in clusters; cones woody. . . . . **Pinaceae** (pines)
  8. Flowers present, usually showy but sometimes obscure; seeds and ovules embedded in dry or fleshy fruit; ever green or deciduous trees, shrubs, or herbs mostly with broad, multi-veined or narrow, parallel-veined leaves; stems usually not obviously grooved and green; Angiosperms
    11. Plants thallus-like (consisting of a flattened, leaf-like stem without true leaves), mostly less than 6 mm long, floating or submerged in water; flowers often lacking, or extremely reduced (enclosed in flap of tissue and apetalous) . . . . . *Lemna* in **Araceae** (arums)
    11. Plants not thallus-like, stems and leaves normally well-developed (sometimes leaves absent or reduced to spines or scales, sometimes stems pad-like and fleshy or covered by a basal tuft of leaves), well over 6 mm long, terrestrial or aquatic; flowers usually present and obvious, though sometimes reduced in size or lacking petals or sepals
      12. Plants epiphytic and parasitic; not rooted in soil at maturity; stems yellowish-brown to orange or whitish; leaves reduced to scales or absent
        13. Plants parasitic on *Juniperus*, *Pinus*, or other conifers, perennial; stems leathery, somewhat succulent, or brittle, mostly yellowish-brown; flowers unisexual, lacking showy petals, tepals 2-4; fruit a berry . . . . . *Arceuthobium* & *Phoradendron* in **Santalaceae** (sandalwoods)
        13. Plants parasitic on herbaceous dicots (especially Asteraceae, Amaranthaceae, and Fabaceae), annual (or short-lived perennial); stems soft, orange, yellow, or whitish; flowers perfect (bisexual), petals fused into a tubular or bell-shaped corolla with 4-5 lobes; fruit a round capsule . . . . . *Cuscuta* in **Convolvulaceae** (morning glories)
      12. Plants not epiphytic and parasitic; rooted in soil at maturity; stems variable, often woody or green; leaves typically present
        14. Leaves parallel-veined, simple, and entire, sometimes reduced to bladeless sheaths (grass-like plants); flower parts in multiples of 3; plants all herbaceous or rarely subshrubs; Monocots . . . . . Group 1



14. Leaves mostly net-veined (sometimes veins obscure), simple or compound, entire, toothed, lobed, or lacking; flower parts in multiples of 4 or 5 (rarely 3 in *Argemone*, *Eriogonum*, *Rumex*, & Berberidaceae); herbaceous or woody; Dicots
15. Plants woody throughout, trees, shrubs, or woody vines . . . . . Group 2
15. Plants herbaceous or woody only at the base and dying back (woody plants with flowers will also key here)
16. Flowers lacking petals, sepals not enlarged, showy, or petal-like . . . . . Group 3
16. Flowers with showy petals or tepals, or if petals lacking the sepals often enlarged, showy, and petal-like (*Anemone*, *Clematis*, *Coleogyne*, *Comandra*, Elaeagnaceae, Nyctaginaceae)
17. Flowers arranged in head-like clusters subtended by an involucre of green bracts; flowers of 1 or 2 types: strap-shaped ray flowers or small, tubular disk flowers; anthers fused into a ring; ovary inferior; fruit a 1-seeded achene usually topped by a pappus of simple or feathery hairs, scales, or awns, (occasionally absent) . . . . . **Asteraceae** (sunflowers)
17. Flowers not arranged in head-like clusters subtended by an involucre of green bracts, or the involucre is cup-like with lobes only along the rim; flowers variable but not strap-shaped; ovary superior or inferior; fruit variable, usually not topped by a pappus (except in *Valeriana* in Caprifoliaceae)
18. Flowers with 6-10 or more petals or with 6 tepals (petals and sepals similar in size, color, and appearance)
19. Stems succulent and thick, pad-like or cylindrical, with clusters of long spines or tufts of sharp, wool-like hairs; flowers with numerous petals and petal-like sepals (sepals grade into petals) . . . . . **Cactaceae** (cacti)
19. Stems not succulent and thick or pad-like, spines absent or occur singly (*Argemone*); flowers with 6-10 petals or tepals
20. Petals 3-6, minute; flowers unisexual, in ball-like heads; leaf blades 10-25 cm long and palmately 3-7 lobed; trees with exfoliating bark . . . . . **Platanaceae** (sycamores)
20. Petals 6-10, small to large; flowers perfect, inflorescences variable but not ball-like; leaf blades smaller or not palmately lobed; shrubs or forbs (epidermis exfoliating in some Loasaceae)
21. Petals 10, yellow; stamens numerous; ovary inferior, fruit a capsule; leaves with minutely barbed hairs that readily stick to clothing or hair . . . . . **Loasaceae** (stickleleaves)
21. Petals 6-9, yellow, white, purple, red, pink, or greenish; stamens 6-9 or numerous; ovary superior, fruit a berry, capsule, or achene; leaves with spiny, thistle or holly-like margins or otherwise without barbed hairs that stick to clothing or hair
22. Leaves with spiny, holly or thistle-like margins; flowers yellow or white
23. Leaves opposite, deeply palmately divided; petals white or dull cream-colored, fused at base into a tube . . . . . *Linanthus* in **Polemoniaceae** (phloxes)
23. Leaves alternate, pinnately compound or lobed; petals yellow or white, not fused at base into a tube
24. Flowers yellow; leaves pinnately compound, holly-like; fruit a berry . . . . . **Berberidaceae** (barberries)
24. Flowers white; leaves pinnately lobed but not compound, thistle-like; fruit a spiny capsule . . . . . *Argemone* in **Papaveraceae** (poppies)
22. Leaves not spiny; flowers yellow, white, purple, red, pink, or greenish
25. Petals 6-7, pink-purple, attached to rim of 8-12 ribbed cylindrical hypanthium; fruit a capsule; plants perennial forbs . . . . . **Lythraceae** (loosestrifes)
25. Tepals 6, yellow, white, red, pink, or greenish, not attached to the rim of a cylindrical hypanthium (small, cup-like involucre encloses flowers in *Eriogonum*); fruit an achene; plants perennial or annual forbs or shrubs . . . . . **Polygonaceae** (buckwheats)
18. Flowers with 4 or 5 petals or petal-like sepals
26. Flowers with 4 petals . . . . . Group 4
26. Flowers with 5 petals
27. Petals separate to the base . . . . . Group 5
27. Petals fused into a shallow cup (at least at the base) or a tubular cylinder . . . . . Group 6

**Group 1: Monocots**

1. Plants subshrubs or woody at base, leaves thick, evergreen, either sword-like with fibrous margins and sharp tips or grass-like with serrated margins and blunt tips; fruit a woody capsule or papery with 3 broad wings . . . . . *Nolina* & *Yucca* in **Asparagaceae** (asparagus)
1. Plants herbaceous and not woody at base, leaves not thick or evergreen (dying back each year), grass-like or with expanded blades (sword-like but with smooth margins in Typhaceae); fruit variable
2. Flowers in dense, sausage-like terminal spikes, the staminate flowers located above the pistillate in a separate cluster; plants usually over 1 m tall; leaves flat, sword-shaped . . . . . **Typhaceae** (cattails)

2. Flowers not in a dense, sausage-like terminal spike; inflorescences of various shape, flowers staminate, pistillate, or perfect; leaves grass-like or with expanded blades but not sword-like
3. Plants submerged or floating in water; leaves narrow and linear; flowers green, apetalous and in terminal spikes or leaf axils . . . . . **Potamogetonaceae** (pondweeds)
3. Plants not submerged or floating in water; leaves linear and grass-like or broadly oval; flowers with 3-6, often showy, petals or tepals, or if green and apetalous than closely enveloped by 1 or more chaffy bracts; inflorescences variable
4. Flowers reduced, green or brownish, subtended or enclosed by chaffy bracts; petals and sepals absent or reduced to bristles or tiny scales; leaves linear, grass-like
  5. Flowers subtended by 2 or more bracts; stems round or flat; leaf sheaths often split lengthwise . . . . . **Poaceae** (grasses)
  5. Flowers subtended by 1 bract (pistillate flowers enclosed in a sac-like perigynium in *Carex*); stems usually triangular; leaf sheaths usually not split lengthwise . . . . . **Cyperaceae** (sedges)
4. Flowers showy, usually not brown or green, usually not subtended or enclosed by chaffy bracts (except in *Juncus*), though flowers may be subtended by leafy bracts); leaves variable
6. Ovary inferior
  7. Flowers irregular or bilaterally symmetrical, white, green, or brownish-purple; stamens 1 or 2; leaves not flattened edgewise and overlapping (equitant) . . . . . **Orchidaceae** (orchids)
  7. Flowers regular, purple or blue; stamens 3; leaves equitant . . . . . **Iridaceae** (iris)
6. Ovary superior
  8. Flowers of 6 brown or greenish tepals; perianth less than 7 mm long; leaves grass-like . . . . . **Juncaceae** (rushes)
  8. Flowers of 3 green sepals and 3 distinct petals, or if of 6 tepals the segments not brown or greenish; perianth usually over 7 mm long; leaves grass-like, round in cross-section, or broad
    9. Pistils 10-many, separate; petals 3, white . . . . . **Alismataceae** (water plantains)
    9. Pistils solitary; petals or tepals white, yellow, blue, brownish-purple, or pink; flowers
      10. Leaves grass-like, juicy- succulent; petals blue to purple (rarely pink), sepals green; subtended by large, leafy bracts; filaments with purple fringe-like hairs . . . . . **Commelinaceae** (spiderworts)
      10. Leaves usually broadly oval, or if linear and grass-like not succulent; petals white, yellow, brownish-purple, or pink, sepals green or petal-like (tepals), flowers subtended by small, scale-like bracts; filaments without purple fringe-like hairs; "Liliaceae" *sensu lato*
    11. Perianth of distinct petals and sepals, these different in size, color, and appearance . . . . . *Calochortus* in Liliaceae (lilies)
    11. Perianth of essentially uniform tepals (petals and sepals of similar size, color, and petal-like in appearance)
      12. Tepals white, united into a floral tube 5-8 cm long; plants stalkless, flowers borne among basal rosette of grass-like leaves . . . . . *Leucocrinum* in **Asparagaceae** (asparagus)
      12. Tepals white, pink, blue, or purple, all separate or if united the tube short (less than 1 cm) and cup-shaped; flowers terminal on an elongate stem; leaves on stem or basal
      13. Inflorescence an umbel subtended by membranous or leaf-like bracts on a leafless stalk
        14. Tepals all separate; filaments of anthers all separate, not united into a tube; plants often with a strong onion or garlic odor . . . . . *Allium* in **Amaryllidaceae** (amaryllis)
        14. Tepals united at the base into a distinct tube; filaments of anthers united into a tube; plants without an onion or garlic-like odor . . . . . *Androstephium & Dichelostemma* in **Asparagaceae** (asparagus)
  13. Inflorescence a raceme, panicle, or of solitary flowers, not subtended by membranous or leaf-like bracts, flowering stems usually leafy
    15. Leaves minute and scale-like; stems multi-branched from thick tuberous roots . . . . . *Asparagus* in **Asparagaceae** (asparagus)
    15. Leaves not scale-like; stems simple or sparingly branched, from scaly bulbs, corms, rhizomes, or non-tuberous roots
      16. Leaves mostly all basal and grass-like
        17. Flowers white to yellowish, tepals separate all the way to the base . . . . . *Zigadenus* in **Melanthiaceae** (death camas)
        17. Flowers blue to purple, tepals fused into a drooping, urn-shaped tube . . . . . *Muscari* in **Asparagaceae** (asparagus)
      16. Leaves mostly along the stem (few or none at base), linear to broadly oval
        18. Tepals 4-7 mm long, white; fruit a mottled red berry; leaves lanceolate . . . . . *Maianthemum* in **Asparagaceae** (asparagus)
        18. Tepals 10-25 mm long; brownish-purple or greenish; fruit an orange to bright red berry or dry, box-like capsule; leaves ovate to ovate-oblong or linear . . . . . *Prosartes & Fritillaria* in **Liliaceae** (lilies)

**Group 2: Woody dicots**

1. Plants woody vines
  2. Leaves and branches alternate; flowers small, greenish or greenish-yellow; inflorescence a panicle or umbel-like; fruit a fleshy berry
  3. Leaf margins sharply toothed; inflorescence an elongated panicle; berries purple; tendrils opposite leaf bases . . . . . **Vitaceae** (grapes)
  3. Leaf margins entire or if lobed, the lobes with entire margins; inflorescence a panicle or umbel-like; berries black; tendrils lacking (but supported by adventitious roots) . . . . . *Hedera* in **Araliaceae** (ginsengs)
2. Leaves and branches opposite; flowers large, showy, white or purplish-green, or greenish and in catkins; fruit an achene or follicle
  4. Leaves compound; flowers white, showy . . . . . *Clematis* in **Ranunculaceae** (buttercups)
  4. Leaves simple with lobed or toothed margins; flowers white, yellow-orange, or purplish and 5-lobed or small, greenish and in catkins
  5. Flowers large, white, yellow-orange, or purplish-green, 5-lobed . . . . . *Periploca* in **Apocynaceae** (dogbanes)
  5. Flowers small, greenish, in catkins . . . . . *Humulus* in **Cannabaceae** (hemps)
1. Plants trees or shrubs
  6. Stems flattened or cylindrical, succulent, with clusters of spines and short glochids . . . . . *Cylindropuntia* in **Cactaceae** (cacti)
  6. Stems not flattened, or if cylindrical not succulent and lacking clusters of spines and glochids
  7. Leaves spine-tipped, sessile, deeply divided into 3-5 segments; flowers white and tubular . . . . . *Linanthus* in **Polemoniaceae** (phloxes)
  7. Leaves not spine-tipped, sessile, or deeply divided; flowers variable
  8. Leaves and branches opposite or whorled
  9. Leaves compound
    10. Leaves bipinnately compound, consisting of two leaflets
      11. Leaflets further divided into pinnate lobes; leaves petiolate; inflorescence bottle-brush like, elongate; flowers with numerous stamens exerted beyond the inconspicuous petals; fruit pod 7-22 cm long . . . . . *Prosopis* in **Fabaceae** (peas)
      11. Leaflets entire, leaves sessile, opposite, appearing like two butterflies; flowers solitary in leaf axils; stamens 10, shorter than the conspicuous petals; fruits globe-shaped, white-hairy, split into 5 segments . . . . . *Larrea* in **Zygophyllaceae** (caltrops)
    10. Leaves once pinnately compound
      12. Flowers with white petals; inflorescence a compound umbel; fruits blue, red, or black berries . . . . . *Sambucus* in **Adoxaceae** (moschatels)
      12. Flowers greenish or yellowish, without petals; inflorescence not an umbel; fruits dry, winged, oar-like samaras
      13. Fruit a double samara (two dry, winged fruits paired at the base); bundle scars 3; stamens usually 8 . . . . . *Acer negundo* in **Sapindaceae** (maples)
      13. Fruit a single samara; bundle scars more than 3; stamens 2 . . . . . *Fraxinus* in **Oleaceae** (olives)
  9. Leaves simple
    14. Leaves with 3-5 primary lobes, palmately veined; fruit a samara . . . . . **Sapindaceae** (maples)
    14. Leaves entire or with toothed margins, lacking 3-5 primary lobes, mostly pinnately veined; fruits variable
    15. Leaves toothed
      16. Leaves 20-40 cm wide x 25-55 mm long, oval; petals white, often hairy . . . . . *Jamesia* in **Hydrangeaceae** (hydrangeas)
      16. Leaves 3-15 mm wide x 5-30 mm long, elliptic; petals white or red and glabrous
      17. Flowers white; leaves grayish-hairy . . . . . *Ceanothus* in **Rhamnaceae** (buckthorns)
      17. Flowers red; leaves glossy green . . . . . *Paxistima* in **Celastraceae** (staff-trees)
    15. Leaves entire or wavy-margined but not toothed
      18. Leaves silvery or gray from scale-like pubescence: flowers yellow; fruit a silvery-gray berry . . . . . *Shepherdia* in **Elaeagnaceae** (oleasters)
      18. Leaves green or if silvery or gray then not from scale-like pubescence (*Salvia*); flowers variable in color; fruit a capsule, nut, samara, or white or black berry
      19. Leaves fascicled; flowers with 4 yellow sepals and no petals . . . . . *Coleogyne* in **Rosaceae** (roses)
      19. Leaves not fascicled; flowers with 4-5 petals, or if apetalous, sepals not petal-like
      20. Leaves narrowly oval to spoon-shaped, less than 2 cm wide
        21. Flowers blue or purple (rarely white) 2-lipped, in whorled clusters, aromatic; leaves gray . . . . . *Salvia dorrii* in **Lamiaceae** (mints)
        21. Flowers white or cream, funnel-shaped or cup-shaped with 4 or 5 lobes, not whorled; leaves green
        22. Flowers tubular, 4-lobed; fruit a black berry; stamens 2 . . . . . *Ligustrum* in **Oleaceae** (olives)



- 22. Flowers cup-shaped, 4-5 lobed; fruit a capsule; stamens 8 or more .....  
..... *Fendlerella* & *Philadelphus* **Hydrangeaceae** (hydrangeas)
- 20. Leaves broadly oval or elliptic, mostly over 2.5 cm wide
  - 23. Flowers 2.5-4 cm long, two-lipped, petals white with purple spots and 2 yellow stripes; fruit an elongate capsule 12-37 cm long; seeds with tufts of white hair; leaf blades heart-shaped, 10-20 cm long, narrowing to an abrupt tip ..... **Bignoniaceae** (catalpas)
  - 23. Flowers smaller, not 2-lipped, pure white or greenish or apetalous; fruit a berry or samara; seeds without a tuft of hair; leaf blades smaller, without an abruptly narrowed tip
  - 24. Flowers in a silky catkin (staminate) or solitary, lacking petals; fruits a silky berry .....  
..... **Garryaceae** (silktassel-bushes)
  - 24. Flowers in a loose panicle, compound umbel, or short spikes; lacking petals and yellowish or with 4-5 white to pink petals; fruit a fleshy white berry or samara
  - 25. Flowers lacking petals, yellowish; fruit a samara . . . . *Fraxinus anomala* in **Oleaceae** (olives)
  - 25. Flowers with 4-5 white to pink petals; fruit a white berry
  - 26. Flowers with 4 white petals, corolla bowl-shaped, lacking hairs at base; pith of stem white and stringy when broken ..... **Cornaceae** (dogwoods)
  - 26. Flowers with 5 white to pink petals, corolla tubular or bowl-shaped, often with hairs at the base; pith of stem not stringy when broken .....  
..... *Symphoricarpos* in **Caprifoliaceae** (honeysuckles)
- 8. Leaves and branches alternate or rarely in dense fascicles and clustered at base
  - 27. Leaves compound
    - 28. Flowers lacking petals, staminate in drooping catkins, pistillate solitary and subtended by a 4-lobed perianth-like involucre; fruit with a dehiscent husk (drupe) and edible kernel .....  
..... **Juglandaceae** (walnuts)
    - 28. Flowers with petals, perfect; fruits variable
      - 29. Flowers bilaterally symmetrical, pea-shaped; fruit a legume ..... **Fabaceae** (peas)
      - 29. Flowers radially symmetrical, not pea-shaped; fruits variable
        - 30. Leaflets with spiny-toothed margins; flowers showy, yellow; fruit a berry .....  
..... **Berberidaceae** (barberries)
        - 30. Leaflets entire-margined or if toothed the margins not spiny; flowers showy or inconspicuous, color variable; fruit a berry, hip, or samara
          - 31. Flowers often over 1 cm long, white or pink; stems armed with spines or prickles; fruits fleshy .....  
..... *Rosa* & *Rubus* in **Rosaceae** (roses)
          - 31. Flowers less than 1 cm long, whitish-purple, yellowish-brown, or greenish; stems lacking spines or prickles; fruits drupes or samaras
          - 32. Fruit a dry samara; leaves once-pinnately compound with 9-25 leaflets; leaflets entire except for a round gland near the base; flowers in large terminal panicles ..... **Simaroubaceae** (quassias)
          - 32. Fruit a drupe, round and yellow or white, or flattened and red, or orange, often hairy; leaves trifoliolate, once-pinnately compound, or bipinnate, leaflet margins finely round-toothed or lobed; flowers in dense spikes, short panicles, axillary racemes, or cymes
          - 33. Leaves bipinnate; fruit round, yellow or white ..... **Meliaceae** (mahoganies)
          - 33. Leaves trifoliolate or pinnately compound; fruit flattened, white, red, or orange .....  
..... **Anacardiaceae** (cashews)
    - 27. Leaves simple
      - 34. Flowers in head-like inflorescences with strap-like ray flowers or small, tubular disk flowers subtended by an involucre of numerous, overlapping bracts ..... **Asteraceae** (sunflowers)
      - 34. Flowers in catkins, racemes, panicles, or various inflorescences, but never head-like and not differentiated into strap-like ray flowers or tubular disk flowers; inflorescence without an involucre of overlapping bracts (*Eriogonum* has a cup-like involucre)
      - 35. Leaves scale-like and overlapping, resembling a juniper ..... **Tamaricaceae** (tamarisks)
      - 35. Leaves not scale-like and overlapping
        - 36. Plants with spines, thorns, or prickles on the stems
          - 37. Leaves 3-5 lobed ..... **Grossulariaceae** (currants)
          - 37. Leaves entire
            - 38. Flowers green or brown, or covered by white hairs, apetalous; fruits with papery bracts .....  
..... **Amaranthaceae** (amaranths)
            - 38. Flowers with white, yellow, or purplish green petals; fruits are berries, fleshy drupes, follicles, or capsules
              - 39. Leaves silvery with scale-like hairs; fruit a silvery drupe .....  
..... *Elaeagnus* in **Elaeagnaceae** (oleasters)

- 39. Leaves glabrous or pubescent but not silvery with scale-like hairs; fruit a berry, follicle, or capsule
  - 40. Flowers tubular, whitish lavender to greenish purple; berries red; leaves succulent and clustered . . . . . *Lycium* in **Solanaceae** (nightshades)
  - 40. Flowers cup-shaped, not tubular, white; fruit a follicle, capsule, or drupe
    - 41. Leaves fascicled; fruit a pome or hairy drupe . . . . . *Peraphyllum* & *Prunus fasciculata* in **Rosaceae** (roses)
    - 41. Leaves not fascicled; fruit a follicle or capsule
      - 42. Leaves with prominent palmate venation from the base, silvery-pubescent beneath; fruit a capsule . . . . . *Ceanothus* in **Rhamnaceae** (buckthorns)
      - 42. Leaves obscurely veined, pubescent but not silvery beneath; fruit a follicle . . . . . **Crossosomataceae** (greasebushes)
- 36. Plants lacking spines, thorns, or prickles on the stems
  - 43. Leaf margins entire or nearly so
    - 44. Leaves and stems with long spreading hairs mixed with star-shaped hairs or silvery-gray from minute scales . . . . . **Amaranthaceae** (amaranths)
    - 44. Leaves and stems glabrous or without mix of long, spreading and star-shaped hairs
      - 45. Leaves with rolled margins; fruit an achene with a persistent, feathery style . . . . . *Cercocarpus* in **Rosaceae** (roses)
      - 45. Leaves lacking rolled margins (except some *Eriogonum* & *Eriodictyon*); fruits variable but without a persistent, feathery style
        - 46. Bud scales solitary, cap-like; flowers unisexual, in catkins . . . . . *Salix* in **Salicaceae** (willows)
        - 46. Bud scales 2 or more, not cap-like, often inconspicuous; flowers perfect, not in catkins
          - 47. Flowers white, pink, or yellow, saucer-shaped, perianth segments 6; flowers borne in a small, cup-like involucre; inflorescence often umbel-like or racemose; leaves not leathery . . . . . *Eriogonum* in **Polygonaceae** (buckwheats)
          - 47. Flowers white or pink, urn or bell-shaped, not borne in a cup-like involucre; inflorescence a coiled cyme, panicle, or raceme; leaves leathery, evergreen
            - 48. Matted subshrubs with mostly all basal leaves; flowers in a spike-like raceme; fruit a follicle . . . . . *Petrophyton* in **Rosaceae** (roses)
            - 48. Erect shrubs with leafy stems; flowers in a coiled cyme, panicle, or raceme but not spike-like; fruit berry-like or a capsule
              - 49. Leaves broadly elliptic or oval; flowers pink or white, urn-shaped; inflorescence a panicle or raceme . . . . . **Ericaceae** (heaths)
              - 49. Leaves linear; flowers white, bell-shaped; inflorescence a coiled cyme . . . . . *Eriodictyon* in **Boraginaceae** (borages)
      - 43. Leaf margins toothed or deeply lobed
        - 50. Leaves with 5-7 toothed lobes, maple-like; petioles hollow at base and enclosing buds; bark exfoliating; fruiting heads bristly, sessile on rachis . . . . . **Platanaceae** (sycamores)
        - 50. Leaves not lobed and maple-like (except some *Ribes*); petioles not hollow at base and enclosing the buds; bark not exfoliating (although stringy in some *Rosaceae*); fruits variable but not in a bristly head
          - 51. Leaves with 3 prominent veins from near the base, toothed but not lobed; fruit a dry capsule . . . . . *Ceanothus* in **Rhamnaceae** (buckthorns)
          - 51. Leaves not veined as above, or lobed; fruit a capsule, follicle, samara, nut, achene, drupe, pome, berry, or otherwise fleshy
            - 52. Flowers cup-shaped or bell-shaped with 5 white, yellow, pink, or cream petals (yellow, petal-like sepals in *Coleogyne*); fruit a capsule, follicle, achene, drupe, berry, or pome
            - 53. Fruit a flattened, red or orange, hairy drupe; flowers yellowish, in short spikes, developing before the leaves; leaf blades with rounded teeth, entire or occasionally some three-lobed . . . . . *Rhus aromatica* var. *simplicifolia* in **Anacardiaceae** (cashews)
            - 53. Fruit dry, or a berry, if drupe-like round and fleshy without hairs; leaves with rounded lobes or variously tooth-like margins
              - 54. Leaves lance-ovate, dark green above and pale beneath; flowers of 5 white, separate petals; fruit a capsule; plants to 15 cm tall . . . . . *Chimaphila* in **Ericaceae** (heaths)
              - 54. Leaves broadly elliptic to oval or lance-shaped; flowers with white, cream, or pink petals separate or fused at base into a tubular or saucer-shaped hypanthium; fruit a capsule, follicle, achene, drupe, pome, or berry; plants usually well over 15 cm tall
                - 55. Leaves rounded-lobed or maple-like; fruit a berry . . . . . **Grossulariaceae** (currants)
                - 55. Leaves sharply toothed or pinnately-lobed, fruit a capsule, follicle, achene, drupe, or pome . . . . . **Rosaceae** (roses)

- 52. Flowers apetalous, small, brown or greenish, often in catkins or a hollowed receptacle (*Ficus*); fruit a samara, nut, capsule, or fleshy syconium or aggregate (*Ficus* or *Morus*)
- 56. Fruit fleshy, either a fig or a catkin-like cluster of aggregated fleshy carpels; leaves irregularly lobed or deeply 3-5 lobed and palmate . **Moraceae** (mulberries)
- 56. Fruits dry capsules, nuts, or samaras or fleshy drupes (*Celtis*); leaves pinnately lobed or toothed
- 57. Leaf blades often asymmetrical at the base or with a rough, sandpaper texture; fruit a samara or drupe
- 58. Fruit a samara; flowers bisexual, appearing before the leaves; leaves usually with 9 or more pairs of prominent lateral veins . . . . . **Ulmaceae** (elms)
- 58. Fruit a drupe; some or all flowers unisexual, appearing with or after the leaves; leaves usually with 8 or fewer pairs of prominent lateral veins . . . . *Celtis* in **Cannabaceae** (hemps)
- 57. Leaf blades symmetrical at the base or smooth; fruit a nut or capsule (samara-like nut in *Betula*)
- 59. Fruit a capsule; seeds with tuft of hairs; leaves narrow and finely toothed or broadly lance-shaped to triangular with rounded teeth; bud scales single (*Salix*) or numerous (*Populus*) and often sticky-resinous . . . . . **Salicaceae** (willows)
- 59. Fruit a hard, one-seeded nut; leaves oval to elliptic with pinnate lobes, sharp holly-like teeth, or shallow teeth; bud scales numerous, not sticky
- 60. Fruit a winged nut (samara-like) in a drooping, soft catkin; leaves with numerous teeth on margins; twigs roughened with resinous bumps; buds not clustered at tip of stem . . . . . **Betulaceae** (birches)
- 60. Fruit solitary, acorn (nut); leaves pinnately rounded-lobed or with sharp, holly-like margins, teeth few; twigs not roughened with resinous bumps; buds clustered at tip of stem . . . . . **Fagaceae** (oaks)

**Group 3: Dicots with apetalous flowers, sepals not petal-like**

- 1. Plants trees, shrubs, or woody vines
  - 2. Leaves opposite
    - 3. Fruit a samara
      - 4. Fruit a double samara; leaves simple and palmately lobed or palmately compound . . **Sapindaceae** (maples)
      - 4. Fruit a single samara; leaves simple and entire or pinnately compound . . . . . **Oleaceae** (olives)
    - 3. Fruit fleshy, berry or drupe-like, covered by scale-like or silky hairs
      - 5. Flowers in drooping catkins; pubescence of silky hairs . . . . . **Garryaceae** (silktassel-bushes)
      - 5. Flowers solitary or in small clusters in leaf axils, not in drooping catkins; pubescence of scale-like hairs . . . . . *Shepherdia* in **Elaeagnaceae** (oleasters)
  - 2. Leaves alternate
    - 6. Plants woody vines, leaves palmately lobed, with tendrils opposite of the leaves; fruit black or purple fleshy berry (grape) . . . . . **Vitaceae** (grapes)
    - 6. Plants not woody vines, lacking tendrils; fruit dry or if fleshy, not grape-like
      - 7. Leaves compound; fruit a nut enclosed by a dehiscent husk . . . . . **Juglandaceae** (walnuts)
      - 7. Leaves simple with entire or lobed margins; fruit a capsule, winged nutlet, berry, achene, or aggregate, if nut-like (**Fagaceae**), not enclosed in a dehiscent husk
      - 8. Flowers in catkins or head-like clusters
        - 9. Spiny shrubs; leaves entire, terete or nearly so, fleshy; fruit a utricle . . . . **Sarcobataceae** (greasewoods)
        - 9. Trees or shrubs, not spiny; leaves entire, lobed, or toothed, flat, not fleshy; fruit a winged nutlet, nut, aggregate, or capsule
          - 10. Leaves palmately veined, margins with rounded teeth or irregular lobes; fruit a fleshy, globose, aggregate . . . . . *Morus* in **Moraceae** (mulberries)
          - 10. Leaves pinnately veined, margins sharply toothed or with rounded teeth or lobes; fruit a winged nutlet, nut, or capsule
            - 11. Plants dioecious; fruit a capsule, seeds hairy . . . . . **Salicaceae** (willows)
            - 11. Plants monoecious; fruit a samara or nut, seeds not hairy
              - 12. Leaves with sharp-toothed margins; fruit a winged nutlet contained within an herbaceous drooping catkin . . . . . **Betulaceae** (birches)
              - 12. Leaves with deep, rounded lobes or a few scattered, short spines; fruit a nut (acorn) subtended by a woody cap occurring singly or small clusters in leaf axils . . . . . **Fagaceae** (oaks)
      - 8. Flowers occur singly or in small clusters in leaf axils or in panicles, not in catkins
        - 13. Ovary inferior, fruit drupe-like . . . . . *Elaeagnus* in **Elaeagnaceae** (oleasters)
        - 13. Ovary superior; fruit an achene, utricle, samara, drupe, or fig-like

- 14. Leaves irregularly lobed, to 25 cm long and 20 cm wide; fruit fleshy, fig-like . . . . . *Ficus* in **Moraceae** (mulberries)
- 14. Leaves entire or with toothed margins, less than 15 cm long and 8 cm wide; fruit dry or a drupe, not fig-like
  - 15. Shrubs with silvery scale-like hairs or white star-shaped or simple pubescence; leaves entire; fruit a utricle . . . . . **Amaranthaceae** (amaranths)
  - 15. Shrubs or trees without scale-like or white star-shaped pubescence; leaves entire or toothed; fruit a samara, drupe, or achene
    - 16. Fruit an achene with a persistent, feathery style; leaves; leaves narrowly to broadly elliptic, to 2.5 cm wide, entire or toothed along the upper half of the margin, not uneven at the base or with a sandpapery texture . . . . . *Cercocarpus* in **Rosaceae** (roses)
    - 16. Fruit a samara (*Ulmus*); leaves ovate to lance-shaped, to 8 cm wide, entire or toothed, often uneven at the base and with a sandpapery texture
      - 17. Fruit a samara; flowers bisexual, appearing before the leaves; leaves usually with 9 or more pairs of prominent lateral veins . . . . . **Ulmaceae** (elms)
      - 17. Fruit a drupe; some or all flowers unisexual, appearing with or after the leaves; leaves usually with 8 or fewer pairs of prominent lateral veins . . . . . *Celtis* in **Cannabaceae** (hemps)
- 1. Plants annual or perennial herbs
  - 18. Plants with milky juice; inflorescence appearing like a flower but consisting of a cup-shaped involucre with 4 teeth or lobes (glands) on the rim; each involucre with a single, long-stalked pistillate flower (becoming the capsular fruit) and several sessile staminate flowers . . . . . *Euphorbia* & *Chamaesyce* in **Euphorbiaceae** (spurges)
  - 18. Plants without milky juice; inflorescence not as above
    - 19. Plants with stinging hairs
      - 20. Leaves opposite, 4-18 cm long; fruit an achene. . . . . *Urtica* in **Urticaceae** (nettles)
      - 20. Leaves alternate, 1-4 cm long; fruit a 3-lobed capsule . . . . . *Tragia* in **Euphorbiaceae** (spurges)
    - 19. Plants without stinging hairs
      - 21. Leaves compound
        - 22. Leaves palmately compound . . . . . *Cannabis* in **Cannabaceae** (hemps)
        - 22. Leaves pinnately or ternately compound
          - 23. Leaves pinnately compound, leaflets toothed; flowers in a head-like inflorescence; fruit enclosed in a 4-angled hypanthium . . . . . *Sanguisorba* in **Rosaceae** (roses)
          - 23. Leaves 2-3 times ternately compound, leaflets lobed at the tip; flowers in an open raceme or panicle; fruit a cluster of beaked achenes . . . . . *Thalictrum* in **Ranunculaceae** (buttercups)
      - 21. Leaves simple
        - 24. Leaves whorled or opposite
          - 25. Annual herbs; leaves whorled, entire, fleshy, narrowly linear; flowers in leaf axils, not in an herbaceous, cone-like inflorescence . . . . . **Molluginaceae** (carpetweeds)
          - 25. Perennial vines with twining, scabrous stems; leaves opposite, deeply lobed and toothed, ovate to orbicular; flowers in a short, herbaceous, cone-like spike . . . . . *Humulus* in **Cannabaceae** (hemps)
        - 24. Leaves alternate
          - 26. Foliage with star-shaped (stellate) hairs . . . . . *Croton* in **Euphorbiaceae** (spurges)
          - 26. Foliage glabrous or pubescent with simple or scale-like or mealy pubescence, not star-shaped (except in *Krascheninnikovia* which is woody at the base)
            - 27. Calyx 4 parted; flowers in sessile clusters in leaf axils; styles and stigmas solitary; annuals with green, fine hairy to glabrous foliage . . . . . *Parietaria* in **Urticaceae** (nettles)
            - 27. Calyx 4 or 5 parted; flowers in clusters in leaf axils or terminal inflorescences; styles and stigmas 2; annuals, perennials, or shrubs, often with grayish, mealy pubescence or dense hairs . . . . . **Amaranthaceae** (amaranths)

**Group 4: Dicots with 4 petals or petal-like sepals**

- 1. Flowers in dense, spiny, terminal heads subtended by a whorl of unequal, sharp-tipped, prickly bracts; leaves opposite, sessile, and fused at base into a cup; stems with prickles . . . . . **Dipsacaceae** (teasels)
- 1. Flowers not in dense, spiny terminal heads subtended by prickly bracts; leaves alternate or opposite, but not forming a cup; stems smooth or raspy (Rubiaceae)
  - 2. Petals lacking, calyx 4-lobed, yellow on inside; trees or shrubs
    - 3. Foliage with gray, scale-like hairs; trees or shrubs with fleshy or dry berry-like or drupe-like fruit . . . . . **Elaeagnaceae** (oleasters)
    - 3. Foliage pubescent with stiff, appressed hairs, dark green to blackish; shrubs with dry achenes . . . . . *Coleogyne* in **Rosaceae** (roses)

2. Petals present, or if lacking then sepals large, separate, white or purple, and petal-like (*Clematis*); foliage glabrous or variously pubescent, but without gray, scale-like hairs; trees, shrubs, vines, or forbs
4. Sepals 4, petal-like, white or blue-purple, true petals absent; woody vines; fruits a cluster of achenes with feathery styles ..... *Clematis* in **Ranunculaceae** (buttercups)
4. Sepals 4, green and not petal-like; true petals present; trees, shrubs, or forbs; fruits variable
5. Flowers pea-like, irregular; leaves pinnately or palmately compound; fruits a capsule, legume, or loment
6. Flowers white, blue, purple, pink, or occasionally yellow, with an enlarged, recurved upper petal (banner) larger than the two lateral petals (wings), the lowermost petal boat-shaped (keel) and enclosing stamens and ovary; filaments of stamens joined to form a sheath or all separate, 10 (5 in *Dalea*); fruit a legume or loment; plants trees, shrubs, or annual or perennial forbs ..... **Fabaceae** (peas)
6. Flowers yellow with 2 pairs of dissimilar petals, one petal spurred at the base; stamens 6 in 2 sets; fruit a capsule; plants annual or biennial forbs ..... *Corydalis* in **Papaveraceae** (poppies)
5. Flowers not pea-like, regular or irregular; leaves mostly simple and entire, but compound in some Brassicaceae, Cleomaceae, and Papaveraceae); fruits variable, but not legumes or loment
7. Petals all separate to the base
8. Ovary inferior; flowers with a tubular hypanthium below the petals; fruit a capsule or nut
  9. Plants woody shrubs; stamens numerous; hypanthium short; leaves opposite ..... *Philadelphus* in **Hydrangeaceae** (hydrangeas)
  9. Plants perennial or annual herbs (sometimes woody at very base); hypanthium short to elongate and tubular; leaves alternate or opposite ..... **Onagraceae** (evening-primroses)
8. Ovary superior; flowers without a tubular hypanthium; fruits variable
  10. Plants shrubs or subshrubs; flowers with 4 stamens; leaves simple with entire or finely toothed margins; fruit a drupe or capsule
    11. Flowers white; leaves entire; pith stringy and elastic when petiole broken; fruit a white drupe ..... **Cornaceae** (dogwoods)
    11. Flowers red; leaves with toothed margins; pith not stringy or elastic; fruit a capsule ..... *Paxistima* in **Celastraceae** (staff-trees)
  10. Plants annual or perennial forbs, rarely woody at base (*Lepidium*); flowers usually with 6-12 or more stamens (rarely 4 in some Brassicaceae); leaves simple or compound; fruit a capsule, silique, or silicle
    12. Stamens 12 or more; petals yellow or orange, readily deciduous; fruit a capsule; base of receptacle expanded, forming a raised rim; leaves finely dissected ... *Eschscholzia* in **Papaveraceae** (poppies)
    12. Stamens typically 6 (occasionally 4 by reduction); petals yellow, white, pink, or purple, not readily deciduous; fruit a capsule, silique, or silicle; base of receptacle not expanded or raised; leaves entire to compound
      13. Stamens in 2 series, outer 2 short, inner 4 long; fruit a silique or silicle, comprised of two cells separated by a membrane (replum); leaves entire or pinnately lobed ..... **Brassicaceae** (mustards)
      13. Stamens all equal; fruit a capsule comprised of a single cell without a dividing membrane; leaves palmately compound ..... **Cleomaceae** (capers)
7. Petals fused at base into a shallow cup or tube
  14. Flowers irregular, petals unequal; ovary superior
    15. Corolla weakly two-lipped, upper lobe broader than 3 lower lobes; flowers arranged in sessile clusters in upper leaf axils; stems square; plants strongly aromatic; fruit consists of four 1-seeded nutlets ..... *Mentha* and *Lycopus* in **Lamiaceae** (mints)
    15. Corolla not two-lipped, petals of unequal size, lowest much smaller and narrower than the three others; flowers occurring singly or in racemes in leaf axils; stems round; plants not especially aromatic; fruit a capsule ..... *Veronica* in **Plantaginaceae** (plantains)
  14. Flowers regular, petals equal; ovary superior or inferior
    16. Ovary inferior; leaves opposite or whorled; stems square and often scabrous (*Galium*) or round and glabrous (*Kelloggia*); fruit a 2-parted, round schizocarp, often with straight or crinkly hairs ..... **Rubiaceae** (madders)
    16. Ovary superior; leaves opposite or basal; stems not square or scabrous; fruit a berry or capsule without straight or crinkly hairs
      17. Woody shrubs; leaves opposite; corolla white; stamens 2; fruit a berry ..... *Ligustrum* in **Oleaceae** (olives)
      17. Plants herbaceous annuals or perennials; leaves opposite, whorled, or all basal; corolla white, greenish, blue-purple, or membranous; stamens 4; fruit a capsule
        18. Corolla white, greenish, or blue-purple, showy; stem leaves opposite or whorled; fruit a capsule opening by vertical slits ..... **Gentianaceae** (gentians)
        18. Corolla whitish or membranous, not showy; stem leaves lacking, all basal; fruit a capsule opening across the top (cap-like) ..... *Plantago* in **Plantaginaceae** (plantains)

**Group 5: Dicots with 5 petals or petal-like sepals separate to the base**

1. Flowers irregular
  2. Pistils 3-5; stamens more than 10; upper sepal hooded or spurred; sepals 5, petal-like, petals 2 or 4 . . . . . *Aconitum & Delphinium* in **Ranunculaceae** (buttercups)
  2. Pistils solitary; stamens 10 or fewer; sepals 5 and green, petals 5
    3. Stamens 5; flowers spurred; leaves simple; fruit a capsule; plants herbaceous . . . . . **Violaceae** (violets)
    3. Stamens 9 or 10, or if 5 then leaves compound; flowers not spurred; fruits a legume or loment; plants trees, shrubs, or herbaceous . . . . . *Dalea, Gleditsia, & Psoralea* in **Fabaceae** (peas)
1. Flowers regular
  4. Plants woody vines; leaves palmately lobed, alternate, with tendrils opposite of the leaves; petals small, white, united at tips but separate at base, early deciduous; inflorescence a panicle opposite a leaf; fruit black or purple fleshy berry (grape) . . . . . **Vitaceae** (grapes)
  4. Plants trees, shrubs, or herbaceous but not woody vines (except *Clematis* with opposite, compound leaves); leaves alternate, opposite, or whorled, simple or compound, if palmately lobed then without opposite tendrils; petals variable but typically not attached at the top; inflorescence variable; fruit variable but not grape-like
  5. Only petals or sepals present (not both), parts all petal-like in appearance and color (not green); fruit an achene; plants vines or herbaceous
    6. Perianth 6-18 mm, white, cream, rose-pink, or purple; flowers in cymes; leaves palmately lobed or compound, opposite or basal; achenes hairy . . . . . *Anemone & Clematis* in **Ranunculaceae** (buttercups)
    6. Perianth 1.5-4.5 mm long, mostly white, pink, or green with white or pink margins; flowers in terminal spikes or single in leaf axils; leaves elliptic, linear, or arrowhead-shaped, alternate; achenes lens-shaped or 3-angled . . . . . *Polygonum* in **Polygonaceae** (buckwheats)
  5. Petals and sepals both present, sepals green and small, petals large and showy or greenish and small; fruit variable; plants trees, shrubs, or herbaceous but not viney
    7. Leaves compound (palmate, pinnate, bipinnate, or ternately divided into separate leaflets)
      8. Leaves opposite, whorled, or in clusters on short spur branches on stem
        9. Leaves bipinnately compound, consisting of two leaflets
          10. Leaflets further divided into pinnate lobes; leaves petiolate and clustered on short spur branches; inflorescence bottlebrush-like, elongate; flowers with numerous stamens exerted beyond the inconspicuous petals; fruit pod 7-22 cm long . . . . . *Prosopis* in **Fabaceae** (peas)
          10. Leaflets entire, leaves sessile, opposite, appearing like two butterflies; flowers solitary in leaf axils; stamens 10, shorter than the conspicuous petals; fruits globe-shaped, white-hairy, split into 5 segments . . . . . *Larrea* in **Zygophyllaceae** (caltrops)
        9. Leaves ternate or pinnately compound with 3 or more leaflets
          11. Trees with ternately compound leaves; fruit a double samara . . . . . *Acer negundo* in **Sapindaceae** (maples)
          11. Herbs with pinnately compound leaves and 5 or more pairs of leaflets; fruit a schizocarp splitting into sharp-tipped or spiny segments
            12. Petals pink or rose and ciliate at the base; leaflets deeply lobed, fern-like; fruit with a long beak that splits at maturity from the base (initially remaining attached at the tip of the beak) . . . . . *Erodium* in **Geraniaceae** (geraniums)
            12. Petals yellow or rarely white and not ciliate at the base; leaflets entire; fruit hard and spiny, splitting into 5 spine-tipped segments at maturity . . . . . *Tribulus* in **Zygophyllaceae** (caltrops)
        8. Leaves alternate or all basal
          13. Plants aquatic; submersed leaves divided into linear-filiform segments . . . . . *Ranunculus aquatilis* in **Ranunculaceae** (buttercups)
          13. Plants terrestrial; leaves not divided into linear-filiform segments
            14. Trees or shrubs with once or twice-pinnately compound leaves with 5 or more leaflets, usually well over 20 cm long
              15. Leaves twice-pinnately compound, leaflets toothed; flowers pale lilac, stamens fused into a tube; fruit a yellow, glabrous drupe . . . . . **Meliaceae** (mahoganies)
              15. Leaves once-pinnately compound, leaflets toothed or nearly entire (except for a pair of teeth near the base); flowers greenish or yellowish-brown, stamens not fused into a tube; fruit a samara or red, hairy drupe
                16. Leaflets entire except for pair of gland-like teeth at the base; fruit a samara . . . . . **Simaroubaceae** (quassias)
                16. Leaflets toothed along entire margin; fruit a red, hairy drupe . . . . . *Rhus glabra* in **Anacardiaceae** (cashews)
            14. Herbs, or if shrubby, leaves with 3 leaflets or less than 20 cm long
              17. Stamens more than 10



- 18. Leaves palmately or once-pinnately compound, with prominent stipules; petals inserted on the rim of a hypanthium (a raised cup-like extension of the receptacle, where the sepals and stamens are also attached); plants herbs or shrubs with spiny or prickly stems; fruit achenes, hips, or clusters of berries . . . . . **Rosaceae** (roses)
- 18. Leaves bi- or tri- ternately compound, stipules absent; hypanthium absent; plants herbaceous, without spines or prickles; fruits achenes, follicles, or berries . . . . . *Actaea, Aquilegia, & Ranunculus andersonii* in **Ranunculaceae** (buttercups)
- 17. Stamens 10 or fewer
  - 19. Shrubs; leaves divided into 3 leaflets; fruits are red or white drupes . . . . . *Rhus & Toxicodendron* in **Anacardiaceae** (cashews)
  - 19. Herbs; leaves ternately compound, palmately divided, or pinnately compound with 5 or more clusters of leaflets; fruits variable, but not drupes
    - 20. Leaves palmately compound with 3 rounded and often folded leaflets; flowers hypogynous, petals yellow . . . . . **Oxalidaceae** (wood sorrels)
    - 20. Leaves pinnately or palmately compound or lobed with more than 3 leaflets; flowers epigynous or perigynous
      - 21. Inflorescence an umbel; flowers epigynous; fruit a schizocarp or berry
        - 22. Styles and carpels 2; fruit a schizocarp splitting into 2 dry, flattened (sometimes wing-margined) or square mericarps . . . . . **Apiaceae** (parsleys)
        - 22. Styles and carpels 5; fruit a berry . . . . . **Araliaceae** (ginsengs)
      - 21. Inflorescence a raceme or open cyme, not an umbel, flowers perigynous; fruit a capsule or achene
        - 23. Leaves palmately lobed or divided; petals white, deeply lobed; fruit a capsule . . . . . *Lithophragma* in **Saxifragaceae** (saxifrages)
        - 23. Leaves pinnately compound, leaflets entire or toothed, sessile; petals yellow, entire; fruit of 1-5 achenes . . . . . *Ivesia* in **Rosaceae** (roses)
- 7. Leaves simple, margins entire or lobed but not subdivided into distinct leaflets
  - 24. Flowers with 2 or 4 sepals; leaves fleshy or succulent
    - 25. Stems leafy and prostrate, leaves alternate; plants often turning red in late summer; flowers yellow . . . . . **Portulacaceae** (purslanes)
    - 25. Stems leafy and erect with opposite leaves (sometimes fused into a shield-like structure) or leaves all basal (may be deciduous at flowering time in *Lewisia*) . . . . . **Montiaceae** (spring-beauties)
  - 24. Flowers with 5 sepals; leaves not especially fleshy or succulent (except in *Sedum*)
    - 26. Leaves opposite
      - 27. Leaves palmately lobed or divided
        - 28. Trees or shrubs; flowers inconspicuous, green; fruit a double samara . . . . . **Sapindaceae** (maples)
        - 28. Herbs; flowers showy, large, pink or purple; fruit a beak-like schizocarp . . . . . *Geranium* in **Geraniaceae** (geraniums)
      - 27. Leaves simple or few-toothed
        - 29. Leaves with dark, glandular spots along margins; flowers yellow with black gland spots along petal margins; stamens numerous . . . . . **Hypericaceae** (St. Johnsworts)
        - 29. Leaves without dark, glandular spots along the margins; flowers white or pinkish, without black glands along margin; stamens 5-10
          - 30. Herbs (woody at base and sub-shrubby in *Eremogone macradenia*); nodes swollen; petals entire or 2-lobed . . . . . **Caryophyllaceae** (pinks)
          - 30. Shrubs; nodes not swollen; petals entire, clawed at base
            - 31. Leaves egg-shaped, coarsely toothed, 2-5 cm wide; petals 5-11 mm long . . . . . *Jamesia* in **Hydrangeaceae** (hydrangeas)
            - 31. Leaves elliptic to obovate, entire, less than 1 cm wide; petals 2-4 mm long
              - 32. Leaves thick, broadly elliptic to obovate, pinnately veined; stipules present, attached to petiole; stamens 5, with round filaments; petals with hooded tips . . . . . *Ceanothus* in **Rhamnaceae** (buckthorns)
              - 32. Leaves thin, narrowly elliptic, 3-veined from the base; stipules not present; stamens usually 10, with conspicuously broad and flat filaments; petals flat or slightly toothed at tips . . . . . *Fendlerella* in **Hydrangeaceae** (hydrangeas)
    - 26. Leaves alternate or all basal, or in fascicles on short spur branches (these branches all alternate)
      - 33. Leaves scale-like and appressed and overlapping on the stem, similar in appearance to *Juniperus*; flowers pink or white in a bottlebrush-like raceme . . . . . **Tamaricaceae** (tamarisks)
      - 33. Leaves not scale-like or appressed and overlapping on the stem; flowers variable in color, but not in a bottlebrush-like inflorescence (except some *Prunus* and *Polygonum*)
      - 34. Plants shrubs or subshrubs with woody rootcrowns

- 35. Leaves with entire or finely toothed margins, venation either not apparent or of 3 main veins originating from the leaf base
- 36. Flowers in terminal or axillary umbels or racemes; sepals petal-like in color and texture; petals clawed at base and with a hooded blade; fruit initially drupe-like with a fleshy outer coat, maturing as a dry capsule . . . . . **Rhamnaceae** (buckthorns)
- 36. Flowers single or few in leaf axils or in a dense, erect spike; sepals green; petals white, narrowly oblanceolate to obovate, clawed or not, blade not hooded; fruit a follicle or pome
- 37. Intricately branched, somewhat spiny shrubs; stamens 4-10; fruit a strongly asymmetrical, leathery, striate follicle . . . . . **Crossosomataceae** (greasebushes)
- 37. Matted subshrubs or unarmed shrubs; stamens 15-20; fruit a symmetrical, non-striate follicle or fleshy pome . . . . . *Peraphyllum & Petrophytum* in **Rosaceae** (roses)
- 35. Leaves with deeply lobed or sharply toothed margins, venation either pinnate or palmate
- 38. Petals yellow, less than 3 mm long; flowers without a hypanthium, often appearing before the leaves; stamens 5; fruit a red or orange drupe with glandular hairs . . . . .  
. . . . . *Rhus aromatica* var. *simplicifolia* in **Anacardiaceae** (cashews)
- 38. Petals white, cream, pink, or yellow, mostly well over 3 mm long (except *Holodiscus*); flowers usually with a tubular or bowl-shaped hypanthium, opening with or after the leaves; stamens usually 10 to numerous (5 in *Ribes*); fruit a capsule, berry, achene, pome, follicle, or drupe without glandular hairs
- 39. Flowers with a tubular or cup-shaped hypanthium; sepals typically larger and more colorful than the petals; plants with spiny stems or not; fruit a smooth or bristly berry; stamens 5 . . . . .  
. . . . . **Grossulariaceae** (currants)
- 39. Flowers with a shallow cup-shaped hypanthium; sepals smaller than petals, green; plants not spiny; fruit variable but not a berry; stamens 10 to numerous . . . . . **Rosaceae** (roses)
- 34. Plants herbaceous, annual or perennial
- 40. Leaves fleshy-succulent, entire, opposite on flowering stems or clustered on side stems; flowers yellow; fruit a 5-parted follicle with recurved tips and fused at the base . . . . .  
. . . . . **Crassulaceae** (stonecrops)
- 40. Leaves not especially fleshy-succulent, entire or palmately lobed or compound, or with toothed margins; flowers white, pink, blue, red, orange, or yellow; fruit an achene, schizocarp, or capsule
- 41. Flowers epigynous, ovary inferior; leaves with minutely barbed hairs that readily stick to fur or clothing . . . . . **Loasaceae** (stickleafs)
- 41. Flowers hypogynous or perigynous (with a hypanthium), ovary superior; leaves without minutely barbed hairs that readily stick to fur or clothing
- 42. Pistils numerous, often on a raised or cylindrical receptacle; fruit a cluster of achenes, usually with a straight or curved beak; stamens often numerous (few in *Myosurus* with spurred sepals) . . . . . **Ranunculaceae** (buttercups)
- 42. Pistils solitary or 2-4 fused at the base (Saxifragaceae), not on a raised or cylindrical receptacle; fruit a beaked or wheel-shaped schizocarp or capsule
- 43. Stamens numerous, fused by their filaments into an elongate central column; petals joined at their bases to the column; fruit a wheel-shaped schizocarp, splitting into individual wedge-shaped mericarps . . . . . **Malvaceae** (mallows)
- 43. Stamens 5-10, not fused into an elongate central column; petals attached to rim of a hypanthium (Saxifragaceae) or all separate; fruit a capsule or beaked schizocarp, splitting into ciliate-margined wedges in Linaceae
- 44. Petals and sepals attached to rim of a shallow, cup-like hypanthium (flowers perigynous); pistils 2-4, fused at the base, style beaks short, often diverging in fruit; petals entire or deeply lobed (*Lithophragma*), mostly white, pink, or red; fringed sterile stamens (staminodes) present in *Parnassia*
- 45. Flowers solitary and terminal on long scapes with a solitary bract; petals 6-14 mm long; leaves entire; fertile stamens 5 alternating with clusters of sterile staminodes . . . . .  
. . . . . *Parnassia* in **Celastraceae** (staff-trees)
- 45. Flowers not solitary, scapes without bracts; petals 2-4 mm long; leaves toothed or lobed; fertile stamens 5 or 10 but not alternating with clusters of sterile staminodes. . . . .  
. . . . . **Saxifragaceae** (saxifrages)
- 44. Petals and sepals not attached to the rim of a hypanthium (flowers hypogynous); pistils solitary; styles beak-like, shield-like, or split to base into 5 ball-tipped segments; petals entire, white, pinkish-purple, blue, or yellow; fringed sterile stamens not present
- 46. Leaves deeply 3-5 lobed, maple-like; petals rose-purple or white with distinct reddish-purple nerves, hairy at the base, entire; styles united into a beak-like column; fruit a beaked

- schizocarp splitting into 5 segments, initially attached at the tip but free at the base and coiled ..... *Geranium* in **Geraniaceae** (geraniums)
46. Leaves entire or finely toothed, not maple-like; petals white, pink, blue, or yellow, not hairy at the base; styles shield-like or divided into 5 ball-tipped segments; fruit a round capsule, not splitting as above
47. Flowers yellow or blue, rarely whitish; stamens 5; style divided into 5 ball-tipped segments; fruit a capsule splitting into 10 wedge-shaped parts ..... **Linaceae** (flaxes)
47. Flowers white; stamens 10; style shield-like; fruit a 5-parted capsule ..... *Chimaphila* in **Ericaceae** (heaths)

**Group 6: Dicots with 5 fused petals or petal-like sepals**

1. Flowers irregular or bilaterally symmetrical
  2. Plants fully parasitic on the roots of other plants, stems fleshy, pale tan to orangish, not green; leaves small and scale-like, non-green ..... *Orobanche* in **Orobanchaceae** (broomrapes)
  2. Plants not parasitic, or only partially parasitic (other genera of Orobanchaceae), but then with green stems and fully developed green leaves
  3. Ovary inferior; stamens 3 or 5, anthers and upper filaments fused into a column or not
    4. Leaves opposite; stamens 3, anthers and upper filaments not fused; base of corolla expanded into a sac-like lobe; flowers clustered in dense spike ..... *Plectritis* in **Caprifoliaceae** (honeysuckles)
    4. Leaves alternate; stamens 5, fused by their anthers and upper filaments into a column; base of corolla not expanded into a sac-like lobe; flowers in a dense to open raceme ..... **Campanulaceae** (bellflowers)
  3. Ovary superior; stamens 4 or 5 and not fused by their anthers and upper filaments into a column
    5. Trees with opposite or whorled leaves; fruit a linear capsule 20-50 cm long; seeds with conspicuous tufts of white hair at each end ..... **Bignoniaceae** (catalpas)
    5. Herbs with opposite or alternate leaves; fruit a nutlet or capsule less than 20 cm long (capsule to 35 cm long in Martyniaceae, but then broad at the base and with strongly curved tips); seeds without tufts of hair
    6. Fruit split into 4 one-seeded nutlets at maturity; stems often square
      7. Ovary deeply lobed, with style emerging from base of lobes; shrubs or perennial or annual herbs, plants often strongly aromatic, ..... **Lamiaceae** (mints)
      7. Ovary not deeply lobed, style emerging from top; annual to biennial prostrate herbs; plants not aromatic . . . . . **Verbenaceae** (vervains)
    6. Fruit a multi-seeded capsule, papery or woody in texture; stems usually not square
      8. Fruit 15-35 cm long, initially with a fleshy coat, becoming dry and woody with an enlarged base bearing a crest and a curved beak that splits lengthwise at maturity; annual herb with sticky-glandular pubescence and opposite leaves ..... **Martyniaceae** (sesames)
      8. Fruits less than 5 cm long, dry capsules without fleshy coats, enlarged crested bases, or long curved beaks; perennial or annual herbs without sticky pubescence (although sometimes glandular); leaves alternate or opposite
      9. Leaves opposite (at least at base of stem and below inflorescence)
      10. Plants perennial
        11. Flowers blue, purple, or red; sepals separate or fused only at very base; 4 fertile stamens, sterile fifth stamen (staminode) lacks an anther and is reduced to a densely pubescent to glabrous filament; style entire with 1 stigma ..... *Penstemon* in **Plantaginaceae** (plantains)
        11. Flowers yellow or red; sepals fused into an elongate, 4-5 lobed calyx; fertile stamens 4, sterile staminode not present; style forked and with 2 distinct stigmatic lobes ..... **Phrymaceae** (lopseeds)
      10. Plants annual
        12. Flowers blue and white; calyx lobes equal in length to calyx tube ..... *Collinsia* in **Plantaginaceae** (plantains)
        12. Flowers yellow or red; calyx lobes much shorter than calyx tube ..... **Phrymaceae** (lopseeds)
    9. Leaves alternate (on upper stem below the inflorescence) or mostly all basal
      13. Flowers spurred at base, yellow; leaves and bracts entire; upper lip of corolla lobed but not forming a hood that encloses the anthers. .... *Linaria* in **Plantaginaceae** (plantains)
      14. Flowers not spurred at base, red, yellow, orange, pink, or white; at least some leaves or bracts lobed or pinnately divided; upper lip of corolla forming a hood (galea) that encloses the anthers . . . . . *Castilleja, Cordylanthus, Orthocarpus, & Pedicularis* in **Orobanchaceae** (broomrapes)
1. Flowers regular or radially symmetrical
  15. Plants dioecious, sprawling herbs with tendrils and rough-hairy triangular leaf blades with wedge or heart-shaped bases to 30 cm long; flowers bell-shaped, yellow, 7-15 cm long; staminate flowers with stamens fused by their anthers; pistillate flowers with an inferior ovary; fruit a gourd ..... **Cucurbitaceae** (gourds)

15. Plants monoecious or flowers perfect, growth habit variable but lacking tendrils, leaf blades variable but typically smaller (*Datura* has similarly sized and shaped leaves but blades are not rough hairy); flower shape variable but either smaller, or if as large the corolla is white and toothed (*Datura*); stamens separate (except in Campanulaceae); ovary superior or inferior; fruit not a gourd
16. Ovary inferior, fruit a berry
  17. Plants shrubby; fruit a berry. . . . . *Symphoricarpos* in **Caprifoliaceae** (honeysuckles)
  17. Plants herbaceous; fruit a berry, drupe, capsule, or achene
    18. Stems 4-sided with raspy margins; leaves whorled; corolla pale yellow, sepals usually absent; roots bright orange . . . . . *Rubia* in **Rubiaceae** (madders)
    18. Stems not 4 sided with raspy margins; leaves alternate or opposite but not whorled; corolla lacking (of white petal-like sepals in Santalaceae) or white, pink, or purple
      19. Flowers with a single row of perianth parts (interpreted as sepals) fused on the rim of a hypanthium tube; stamens 5, opposite the sepal lobes; fruit a purplish-brown drupe . . . . **Santalaceae** (sandalwoods)
      19. Flowers with petals and sepals (sepals sometimes appearing absent in Valerianaceae until fruiting, then feather-like), with a short hypanthium (*Samolus*) or none; stamens 1-3 or 5, inserted within corolla tube; fruit a capsule or achene
        20. Leaves opposite, simple or pinnately lobed; stamens 1-3; fruit an achene; calyx white and feathery at maturity; plants often malodorous; inflorescence a panicle- or thyrse-like corymb . . . . . *Valeriana* in **Caprifoliaceae** (honeysuckles)
        20. Leaves alternate, simple with entire or toothed margins; stamens 5; fruit a capsule; calyx green, not feathery at maturity; plants not malodorous; inflorescence a raceme or panicle
          21. Flowers purple, sessile; leaves with toothed margins; stamens alternate with the petal lobes, not attached to the corolla tube . . . . . *Triodanis* in **Campanulaceae** (bellflowers)
          21. Flowers white, long-pedicelated ; leaves with entire margins; stamens opposite the petal lobes and attached to the corolla tube . . . . . *Samolus* in **Primulaceae** (primroses)
  16. Ovary superior, fruit a capsule, follicle, nutlet, or berry
    22. Corolla urn-shaped, flowers usually on recurved pedicels; stamens 10, anthers with flap-like appendages, opening by terminal pores; shrubs or non-photosynthetic herbs. . . . . **Ericaceae** (heaths)
    22. Corolla not urn-shaped, or if so, with 5 or fewer stamens, anthers lacking flap-like appendages or without terminal pores
      23. Sepals petal-like, fused into a shallow bowl or slender tube, true petals absent; flowers subtended by green, sepal-like leaves (bracts); fruit enclosed by persistent base of the calyx and indehiscent (anthocarp), often broadly winged at maturity . . . . . **Nyctaginaceae** (four o'clocks)
      23. Flowers with a distinct calyx of sepals and corolla of petals; fruit variable but not an anthocarp
        24. Stamens 10; plants herbaceous with succulent leaves; petals fused only at very base; fruit of 5 follicles attached only at the base . . . . . **Crassulaceae** (stonecrops)
        24. Stamens 5 or fewer; leaves not succulent, or if so (as in *Lycium*), plants shrubby; petals fused above the base; fruit variable, if a follicle then only consisting of 1-2 per flower
          25. Plants exude milky juice when leaves or stems are cut; fruit a follicle . . . . . **Apocynaceae** (dogbanes & milkweeds)
          25. Plants not exuding milky juice when leaves or stems are cut; fruit variable
            26. Plants scapose (leaves all in a basal rosette); flowers in terminal umbels; stamens opposite the petal lobes . . . . . **Primulaceae** (primroses)
            26. Plants not scapose, stems leafy; flowers not in umbels; stamens alternate with corolla lobes or attached inside corolla tube
              27. Ovary 4 lobed, fruit comprised of 4 one-seeded nutlets
                28. Leaves alternate; stems and foliage usually hirsute or with bristly hairs, not glandular; stamens 5; corolla limb usually with spreading lobes (limb tubular in *Mertensia*) . . . . **Boraginaceae** (borages)
                28. Leaves opposite; stems and foliage glabrous to pubescent, but not hirsute, also glandular and aromatic; stamens 4; corolla weakly 2-lipped, deeply divided into 5 slender lobes . . . . . *Monardella* in **Lamiaceae** (mints)
              27. Ovary not 4 lobed, fruit not comprised of one-seeded nutlets
                29. Styles with 3 lobes, fruit a 3-lobed capsule, flowers long-tubular . . . . . **Polemoniaceae** (phloxes)
                29. Styles not 3-lobed, fruit not 3-lobed, a capsule or berry-like
                  30. Stems twining; leaves arrowhead or heart-shaped at base; corolla funnel-shaped, scarcely lobed . . . . . **Convolvulaceae** (morning glories)
                  30. Stems not twining; leaves entire or deeply lobed but not arrowhead or heart-shaped at base; corolla tubular, cup-shaped, or funnel shaped, usually obviously 5 lobed
        31. Shrubs

- 32. Leaves fascicled, entire-margined, somewhat succulent, drought-deciduous; flowers in leaf axils, greenish-brown to white or yellowish with bluish lobes; fruit a berry . . . . . *Lycium* in **Solanaceae** (potatoes)
- 32. Leaves alternate, with entire or toothed margins, evergreen, green and sticky above, white below; flowers in terminal cymes, white; fruits nutlet-like . . . . . *Eriodictyon* in **Boraginaceae** (borages)
- 31. Herbs
  - 33. Leaves opposite or whorled, entire, usually glabrous or rarely minutely puberulent (never hirsute, tomentose, or glandular) . . . . . **Gentianaceae** (gentians)
  - 33. Leaves alternate or basal (rarely some opposite just at the base of the stem), toothed, wavy-margined, entire, or pinnately lobed or divided, usually pubescent, often coarsely hirsute, glandular, or tomentose
  - 34. Plants biennials with large rosettes of white-tomentose leaves; flowers yellow in dense, bracteate spikes . . . . . *Verbascum* in **Scrophulariaceae** (figworts)
  - 34. Plants annual or perennial, rosettes not present, or leaves not white-tomentose; flowers variable in color, but not both yellow and in dense, bracteate spikes
  - 35. Flowers often in scorpioid cymes or racemes (in axils of basal rosette in *Hesperochiron*); styles 2 or deeply 2-cleft; fruit a capsule (Hydrophyllaceae) . . . . . **Boraginaceae** (borages)
  - 35. Flowers in racemes, cymes, or leaf axils (sometimes solitary), not in scorpioid cymes; styles single, not divided; fruit a berry or capsule . . . . . **Solanaceae** (potatoes)

## II. Key to Genera and Species (Arranged alphabetically by family, families based on APG III system)

### Adoxaceae (Moschatel Family)

#### *Sambucus* (Elderberry)

- 1. Inflorescence flat-topped, mainly 7-30 cm wide; flowers mainly cream-colored; fruit black with a glaucous, waxy bloom . . . . . **S. caerulea** Raf. (Blue elderberry) Shrub, uncom in pinyon-juniper, oak, mountain conifer, and wetland areas, May-Jul (*S. nigra* ssp. *caerulea*).
- 1. Inflorescence obconic to rounded, mainly less than 8 cm wide; flowers white to cream; fruit red (rarely black) . . . . . **S. racemosa** L. var. **microbotrys** (Rydb.) Kear. & Peebles (Red elderberry) Shrub, Reported from montane conifer sites by Welsh (1995), Jun-Jul.

### Alismataceae (Water plantain Family)

#### *Alisma* (Water plantain)

**A. plantago-aquatica** L. (Water plantain) PerForb, uncom in wetlands, Jun-Sep.

### Amaranthaceae (Amaranth Family)

Includes Chenopodiaceae except for Sarcobataceae

- 1. Plants shrubs or subshrubs, stems woody at least at the base
- 2. Leaves densely stellate-hairy, pubescence white but turning golden-brown in age . . . . . **Krascheninnikovia**
- 2. Leaves glabrous or pubescent but not densely white stellate-hairy
- 3. Leaves flat, not fleshy; mature fruits enclosed by triangular or membranous-winged bracts
  - 4. Bracts of pistillate flowers completely enclosing the fruit and flattened with wing-like margins that lack teeth or irregular appendages on the surface; older leaves often red; staminate calyx 4-lobed . . . . . **Grayia**
  - 4. Bracts of pistillate flowers not fused at the tip and not completely enclosing the fruit, bracts flattened or not, without a wing-like margin but often with teeth or irregular appendages on the surface; leaves remain gray or green; staminate calyx usually 5-lobed . . . . . **Atriplex**
- 3. Leaves cylindric to linear, usually fleshy; mature fruits slightly wing-margined, not enclosed by bracts
  - 5. Erect shrubs with thorny branches; staminate flowers in spikes, pistillate flowers occur singly in leaf axils; mature fruits with a single, wing-like margin encircling the body of the fruit . . . . . see **Sarcobatus** in Sarcobataceae
  - 5. Subshrubs woody only at the base and without thorny branches; flowers perfect or pistillate, arranged in short, axillary spikes or clusters; mature fruits enclosed by 5-lobed calyx . . . . . **Bassia**

1. Plants herbaceous annuals, not woody at base
  6. Perianth and floral bracts scarious at least on the margins, often with spine-tips; leaves not gray-mealy or succulent; annuals
    7. Leaves broadly oval to elliptic, without a spine-tip, conspicuously petioled; fruit not surrounded by membranous wings (*Amaranthaceae, sensu stricto*) . . . . . ***Amaranthus***
    7. Leaves linear, ending in a sharp spine, blades sessile; fruit surrounded by membranous wings . . . . . ***Salsola***
  6. Perianth and bracts herbaceous, sometimes toothed in *Atriplex* but not spine-tipped; leaves green, gray-mealy or scaly or occasionally succulent; annuals, perennials, or shrubs
    8. Leaves cylindric, fleshy, glabrous, and mostly less than 1.5 mm wide; perianth segments hood-like . . . ***Suaeda***
    8. Leaves flat, fleshy or not, often pubescent with straight hairs or white mealy scales (farinose), mostly 2 mm wide or more
      9. Perianth lacking or of 1-3 short, bract-like segments that do not enclose the fruit; fruits laterally flattened
        10. Flowers clustered in leaf axils without long-attenuate bracts; fruit less than 2 mm long and without a membranous wing; inflorescence not stellate hairy . . . . . ***Monolepis***
        10. Flowers not clustered in leaf axils, subtended by a single, long-attenuate bract; fruit 2-4 mm long and with a membranous wing; inflorescence often stellate hairy . . . . . ***Corispermum***
      9. Perianth 3-5 lobed or sometimes lacking in pistillate flowers; fruit at least partly enclosed by perianth or 2 large, subtending bracts, dorsiventrally or laterally flattened
        11. Flowers unisexual and plants dioecious; pistillate flowers lacking a perianth and enclosed by two bracts that are fused to near the tip . . . . . ***Atriplex***
        11. Flowers bisexual and plants not dioecious; pistillate and staminate flowers with a regular 3-5 lobed perianth and not enclosed by bracts
          12. Inflorescence and leaves (at least leaf margins) pubescent with simple hairs, not farinose; leaves linear to narrowly lance-shaped with entire margins . . . . . ***Bassia***
          12. Inflorescence and leaves densely to sparsely white farinose, rarely glabrous, never pubescent with simple hairs; leaves narrowly elliptic and entire to toothed or arrowhead-shaped and lobed at the base
            13. Stems, leaves, and inflorescence densely pubescent with yellow, aromatic glands; leaves pinnately lobed . . . . . ***Dysphania***
            13. Stems, leaves, and inflorescence glabrous or with white, non-glandular, mealy pubescence (farinose); leaves shallowly toothed or entire . . . . . ***Chenopodium***

***Amaranthus*** (Amaranth)

1. Flowers in an elongate, terminal spike . . . . . ***A. retroflexus*** L.  
(Redroot pigweed) AnnForb, uncom, introduced from Central America, Jun-Sep.
1. Flowers in axils of leaves, not in an elongate terminal spike
  2. Sepals 4 or 5; stems prostrate; seeds ca 1.5 mm wide . . . . . ***A. blitoides*** Wats.  
(Prostrate pigweed) AnnForb, uncom, native but weedy, Jun-Sep.
  2. Sepals 1-3; plants erect to spreading; seeds less than 1.5 mm wide . . . . . ***A. albus*** L.  
(Tumble pigweed) AnnForb, uncom, introduced from tropical America, Jun-Oct.

***Atriplex*** (Saltbush)

1. Plants herbaceous annuals with leaves cordate at base . . . . . ***A. saccaria*** Wats. **var. *saccaria***  
(Stalked orach) AnnForb, uncom on clay soil in warm desert shrub & pinyon-juniper, Aug-Sep, Zion material may be *A. argentea* Nutt..
1. Plants woody shrubs with narrow leaves
  2. Fruiting bracts with 4 lateral wings; stems not spiny at tip . . . . . ***A. canescens*** (Pursh) Nuttall **var. *canescens***  
(Fourwing saltbush) Shrub, com in sandy areas in warm desert, sagebrush, & pinyon-juniper, May-Sep.
  2. Fruiting bracts without lateral wings, surface smooth or with irregular appendages; stems spiny. . . . .  
. . . . . ***A. confertifolia*** (Torr. & Fremont) Wats.  
(Shadscale) Shrub, uncom in clayey soils in warm desert, sagebrush, & pinyon-juniper, May-Sep.

***Bassia*** (Summer-cypress, kochia)

1. Plants annual; herbage glabrous to short pubescent . . . . . ***B. scoparia*** (L.) A.J. Scott  
(Summer-cypress) AnnForb, introduced from Eurasia, uncom in disturbed areas, Aug-Oct (*Kochia scoparia*, *B. sieversiana*).
1. Plants subshrubs, woody at the base; herbage of short, crinkly hairs intermixed with long hairs . . . . .  
. . . . . ***B. prostrata*** (L.) A.J. Scott  
(Forage kochia) Shrub, uncom in disturbed areas, Aug-Oct, Introduced from Eurasia (*Kochia prostrata*).



**Chenopodium** (Goosefoot)

1. Leaf blades mostly entire, ovate to narrowly elliptic, less than 10 mm wide, with 1-3 parallel veins from the base
2. Leaf blades 1-3 times as long as wide, elliptic to ovate . . . . . **C. atrovirens** Rydberg (Mountain goosefoot) AnnForb, rare in Kolob Overlook area in Ponderosa pine woods, Jul-Sep
2. Leaf blades more than 3 times longer than wide, linear to narrowly elliptic . . . . . **C. desiccatum** A. Nelson (Desert goosefoot) AnnForb, uncom in warm desert, sagebrush, and pinyon-juniper, Jun-Sep (*C. pratericola*).
1. Leaf blades triangular-ovate to arrowhead-shaped, coarsely toothed throughout or lobed at the base, 10 mm or more wide, with pinnate venation
3. Leaf blades thin to thickened, often about twice or more as long as wide and toothed throughout, usually farinose at least beneath
4. Flower clusters clumped, midvein of sepals not prominently raised; pericarp covering the seed smooth or only faintly cellular-pitted . . . . . **C. album** L. (Lambsquarter) AnnForb, introduced from Eurasia, Reported by Welsh (1995) in disturbed areas, Jun-Sep.
4. Flower clusters not clumped, midvein of sepals prominently raised and keel-like; pericarp covering the seed pitted in a honeycomb-like pattern . . . . . **C. berlandieri** Moq. var. **zschackei** (Murr) Murr (Pitseed goosefoot) AnnForb, uncom, South campground, Jun-Sep (*C. album* var. *berlandieri*).
3. Leaf blades thin and papery when dry, usually barely if at all longer than wide and lobed at the base, often glabrous or sparsely farinose below . . . . . **C. fremontii** S. Wats.
5. Plants 5-100 or more cm tall; side branches much shorter than the main stem; leaves usually over 15 mm long; leaves often glabrous to sparsely white farinose below . . . . . **var. fremontii** (Fremont's goosefoot) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Jun-Aug.
5. Plants 5-25 cm tall; side branches often equal in size to the main stem; leaves mostly 4-15 mm long; leaves densely white farinose below . . . . . **var. incanum** S. Wats. (Silvery goosefoot) AnnForb, uncom in pinyon-juniper & montane conifer, Jun-Aug (*C. incanum*).

**Corispermum** (Bugseed)

**C. americanum** (Nuttall) Nuttall (American bugseed) AnnForb, rare in sandy places, often colonizing after fire, Aug-Oct.

**Dysphania** (Sticky goosefoot)

**D. botrys** L. (Jerusalem-oak) AnnForb, introduced from Eurasia, uncom in disturbed areas, Aug-Oct (*Teloxys botrys*, *Chenopodium botrys*).

**Grayia** (Hopsage)

**G. spinosa** (Hook.) Moquin in DC. (Spiny hopsage) Shrub; Reported (Cogan et al. 2004) in warm desert & sagebrush (*Atriplex spinosa*, *A. grayi*).

**Krascheninnikovia** (Winterfat)

**K. lanata** (Pursh) Meeuse & Smit **var. lanata** (Winterfat) Shrub, uncom in warm desert, sagebrush, & pinyon-juniper, May-Jul (*Ceratoides lanata*, *Eurotia lanata*).

**Monolepis** (Poverty-weed)

**M. nuttalliana** (Schultes) Greene (Nuttall's poverty-weed) AnnForb, uncom in warm desert scrub, sagebrush, pinyon-juniper, & montane conifer, Apr-Jul.

**Salsola** (Russian-thistle)

**S. tragus** L. (Russian-thistle) AnnForb, introduced from Asia, com in disturbed areas, Jun-Sep (*S. kali*, *S. pestifer*, *S. australis*).

**Suaeda** (Seepweed)

**S. occidentalis** (S. Watson) S. Watson (Western seepweed) AnnForb, uncom in wetlands & warm desert, Jun-Sep.

## Amaryllidaceae (Amaryllis Family)

### *Allium* (Onion)

1. Leaves 1 per scape, round in cross-section or nearly so and solid. . . . . **A. nevadense** Wats.  
(Nevada onion) PerForb, uncom in warm desert, sagebrush, & pinyon-juniper, Apr-Jul.
1. Leaves 2 or more per scape, flat or channeled, or if round then hollow in cross-section
2. Leaves hollow . . . . . **A. schoenoprasum** L.  
(Chives) PerForb, uncom in housing area, cultivated forms native to Europe.
2. Leaves solid
3. Outer bulb scales thin, reticulations striate above; ovary with 6 prominent, saw-toothed crests . . . . .  
. . . . . **A. bisceptrum** Wats.  
(Twincrest onion) PerForb, uncom. in pinyon-juniper, oak, & montane conifer, May-Jul.
3. Outer bulb scales thin, reticulations box-shaped; ovary with 3 small crests . . . . . **A. acuminatum** Hook.  
(Taper-tip onion) PerForb, uncom, pinyon-juniper, oak, sagebrush, & montane conifer, May-Jul.

## Anacardiaceae (Cashew Family)

1. Leaves simple but lobed . . . . . **Rhus**
1. Leaves divided into three leaflets or pinnately compound with 7 or more leaflets
2. Leaflets 3, lateral ones over 3.5 cm long and 2.5 cm wide; mature fruit whitish, glabrous . . . . . **Toxicodendron**
2. Leaflets 7-21 or more, or if 3 the lateral ones less than 3 cm long and 2.5 cm wide; mature fruits usually red or orange and hairy . . . . . **Rhus**

### *Rhus* (Sumac)

1. Leaves pinnately compound with 7 or more leaflets . . . . . **R. glabra** L.  
(Smooth sumac) Shrub, uncom in pinyon-juniper/oak in canyons or wetlands, Jun-Jul.
1. Leaves simple or palmately compound with 3 leaflets . . . . . **R. aromatica** Aiton
2. Leaves simple, leathery . . . . . **var. simplicifolia** (Greene) Cronq.  
(Squawbush) Shrub, com in warm desert, pinyon-juniper, oak, and sagebrush sites, often on rock outcrops, Apr-Jul (*R. trilobata* var. *simplicifolia*).
2. Leaves palmately compound with 3 leaflets, thin-textured . . . . . **var. trilobata** (Nutt.) Gray ex Watson  
(Squawbush) Shrub, com in wetland areas and canyon, Apr-Jul (*R. trilobata* var. *trilobata*).

### *Toxicodendron* (Poison ivy)

- T. rydbergii** (Small ex Rydb.) Greene (Western poison ivy) Shrub, uncom in canyons and wetlands, May-Jun (*Rhus radicans*, *T. radicans*).

## Apiaceae or Umbelliferae (Parsley Family)

1. Plants with mature fruits
2. Fruit surface covered by tiny spines or prickles; plants annual . . . . . **Torilis**
2. Fruit surface smooth or pubescent with fine hairs, but not covered by spines or prickles; plants perennial
3. Fruits flattened (though may have raised wings or ribs), appearing two-edged and conspicuously wider than thick
4. Leaflets mostly 1-2 times compound, tips of leaflets often over 10 mm wide; plants mostly over 35 cm high with leafy stems . . . . . **Angelica**
4. Leaflets mostly 3 or more times compound (1-2 times pinnate in *Lomatium graveolens*), finely dissected and fern-like, tips of leaflets mostly less than 3 mm wide; plants mostly under 30 cm tall with leafy stems or leaves all basal
5. Fruits without raised wings or ribs on the surface or edge . . . . . **Lomatium**
5. Fruit with prominent wings or raised ribs on the surface or edge . . . . . **Cymopterus**
3. Fruits box-like or cylindrical rather than flattened, nearly as wide as thick
6. Fruits 4 or more times as long as wide . . . . . **Osmorhiza**
6. Fruits less than 4 times as long as wide
7. Leaves less than 6 cm long, once-ternately compound, leaflets divided into 3 linear lobes, each with entire margins; plants less than 10 cm tall . . . . . **Orogenia**
7. Largest leaves over 10 cm long, pinnately compound or 3-4 times ternately compound and fern-like, leaflet margins toothed; plants over 20 cm tall
8. Leaves 3-4 times ternately compound; fruits 5-7 mm long; taproots topped by numerous brown stringy fibers . . . . . **Ligusticum**

- 8. Leaves 1-2 times pinnately compound; fruits 1.5-6 mm long; taproots not topped by brown stringy fibers
- 9. Leaves once-pinnately compound with 7-21 or more pairs of sharply toothed leaflets; fruits 1.5-2 mm long . . . . . **Berula**
- 9. Leaves 1-2 times pinnately compound, with 3-5 pairs of leaflets, the lowest pair often deeply divided or with 2-3 lobes; fruits 3-6 mm long . . . . . **Angelica**
- 1. Plants without mature fruits
- 10. Flowers white
- 11. Stems short or lacking, leaves essentially all basal (sometimes borne a short distance above the ground on a small stem or pseudoscape)
- 12. Leaves finely pubescent . . . . . **Lomatium**
- 12. Leaves glabrous
- 13. Leaves bluish or gray-green, 2-3 times pinnately compound, leaflets deeply lobed or toothed, fern-like . . . . . **Cymopterus**
- 13. Leaves green, once ternately compound, leaflets narrow, linear, entire . . . . . **Orogenia**
- 11. Stems tall, leafy above the middle (upper leaves generally smaller than lower and basal leaves)
- 14. Leaves 1-2 times pinnately or ternately compound, not lacy or fern-like in appearance, leaflet subdivisions broad, usually finely toothed or shallowly lobed
- 15. Basal leaves ternately compound; ovaries with ascending stiff hairs . . . . . **Osmorhiza**
- 15. Basal leaves 1-2 times pinnately compound; ovaries glabrous
- 16. Involucre subtending umbels of narrow, entire to toothed bracts; basal leaves divided into 7-21 coarsely toothed or lobed leaflets, upper stem leaves smaller with narrower leaflets . . . . . **Berula**
- 16. Involucre not present below umbels; basal leaves divided into 5-7 finely-toothed leaflets, upper stem leaves often larger than basal leaves but otherwise of similar appearance . . . . . **Angelica**
- 14. Leaves 3-4 times pinnately compound with a lacy or fern-like appearance, leaflet subdivisions narrow and entire to finely toothed or oval to elliptic and deeply lobed or divided
- 17. Annual forbs without stringy fibers crowning the taproot; upper stems and stalks of umbels with downward-pointing sharp hairs; ovaries prickly . . . . . **Torilis**
- 17. Perennial forbs with stringy fibers crowning the woody taproot; upper stems and stalks of umbels glabrous; ovaries glabrous . . . . . **Ligusticum**
- 10. Flowers yellow or purple (yellow flowers often turning purplish with age)
- 18. Stems short or lacking, leaves essentially all basal (sometimes borne a short distance above the ground on a small stem or pseudoscape)
- 19. Leaves 1-2 times pinnately compound, leaflets linear and entire; flowers purple-black . . . . . **Lomatium**
- 19. Leaves 3-4 times pinnately or ternately compound, leaflets oval to elliptic and finely to coarsely toothed, lobed, or dissected; flowers yellow to purplish . . . . . **Cymopterus**
- 18. Stems tall, leafy above the middle (upper leaves generally becoming smaller than lower and basal leaves)
- 20. Leaflets 3-4 times pinnately compound, leaflets deeply toothed, lobed, or divided into narrow segments. . . . . **Lomatium**
- 20. Leaflets 1-2 times pinnately or ternately compound, leaflets broad, coarsely toothed and lobed . . . . . **Osmorhiza**

**Angelica** (Angelica)

**A. pinnata** Watson (Pinnate angelica) PerForb, uncom in montane conifer & wetland areas, Jun-Aug.

**Berula** (Water-parsnip)

**B. erecta** (Huds.) Coville **var. incisa** (Torr.) Cronq. (Cutleaf water-parsnip) PerForb, uncom on banks of Virgin River in Zion Canyon, Jun-Sep.

**Cymopterus** (Spring-parsley)

- 1. Bracts at base of each individual umbel and the entire inflorescence greenish-purple with white membranous margins and 5 or more purple veins, joined at their base to form a symmetrical cup; petals white or purple . . . . . **C. multinervatus** (Coult. & Rose) Tidestrom (Purple-nerved spring-parsley) PerForb, uncom in warm desert and pinyon-juniper/sagebrush, Mar-Apr.
- 1. Bracts at base of each individual umbel green and leaf-like or green with narrow membranous margins, separate or united only at base into a shallow, asymmetrical cup, no bracts found at base of entire inflorescence; petals yellow, often turning purplish with age
- 2. Leaves in a basal whorl and at the base of the stem; flowering stems 10-60 cm tall; leaf blades to 18 cm long, 3-4 times ternately lobed . . . . . **C. terebinthinus** (Hook.) Tor. & Gray **var. albiflorus** (Nutt.) Jones (Aromatic spring-parsley) PerForb, uncom in pinyon-juniper brush in Kolob area, May-Jun (*Pteryxia terebinthina* var. *albiflora*).

2. Leaves all in a basal cluster; flowering stems 4-20 cm tall, often decumbent; leaf blades 1.5-10 cm long, 2-3 times ternately lobed
3. Umbel bracts green and leaf-like, seldom with thin membranous margins; plants minutely sticky-pubescent, often with sand grains sticking to the leaves. . . . . **C. newberryi** (Wats.) Jones (Sticky spring-parsley) PerForb, uncom in warm desert, pinyon-juniper, oak, & sagebrush on sandy soil, Apr-May.
3. Umbel bracts with thin membranous margins, not leaf-like; plants not sticky pubescent . **C. purpureus** Wats.
4. Leaf blades mostly pinnately compound, terminal leaflet segments narrow; stalks of fruits over 2 cm long, fruits not densely clustered . . . . . **var. purpureus** (Colorado Plateau spring-parsley) PerForb, uncom in desert shrub communities on Moenkopi and Chinle soils. Apr-Jun.
4. Leaf blades mostly ternately compound, terminal leaflet segments broad; stalks of fruits less than 2 cm long, making fruits appear densely clustered . . . . . **var. rosei** (Jones ex Coult. & Rose) Goodrich (Rose's spring-parsley) PerForb, uncom, in mountain brush & Ponderosa pine forests on Carmel limestone, May-Jul (*C. rosei*).

**Ligusticum** (Lovage)

**L. porteri** Coulter & Rose (Southern lovage, Osha) PerForb, rare in pinyon-juniper, oak, sagebrush, or montane conifer habitats, Jun-Aug.

**Lomatium** (Biscuitroot)

1. Stems robust, often over 50 cm tall; small leaves found well up the stem; leaves 3-4 times pinnately compound, fern-like, usually scabrous along the margins on the underside; flowers yellow (sometimes purplish) . . . . . **L. dissectum** (Nutt.) Math. & Constance **var. eatonii** (Coult. & Rose) Cronq. (Giant biscuitroot) PerForb, uncom in pinyon-juniper/oak and montane conifer, Apr-Jun.
1. Stems 5-30 cm tall; leaves all at base of stem; leaves mostly 1-2 times pinnately compound and glabrous or 2-3 times pinnately compound and short-pubescent throughout; flowers white or purplish-black . . . . .
2. Leaves and stems glabrous; leaves mostly 1-2 times pinnately compound; flowers purplish-black . . . . . **L. graveolens** (S. Wats.) Dorn & Hartman **var. clarkii** Welsh (Clark's biscuitroot) PerForb, rare on Carmel limestone on Horse Pasture Plateau and west of Dakota Hill. Type locality from Zion National Park, Jun-Jul.
2. Leaves and stems finely pubescent; leaves 2-3 times pinnately compound, flowers white . . . . . **L. nevadense** (S. Wats.) Coult. & Rose **var. parishii** (Coult. & Rose) Jeps. (Nevada biscuitroot) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, & montane conifer, Apr-May.

**Orogenia** (Indian potato)

**O. linearifolia** S. Wats. (Indian potato) PerForb, rare in pinyon-juniper, sagebrush, oak, & montane conifer, Mar-May.

**Osmorhiza** (Sweet-cicely)

1. Fruits smooth, without bristles, not tapering at the base and equally thick throughout or somewhat tapering at the tip; flowers usually yellow or greenish . . . . . **O. occidentalis** (Nutt.) Torr. (Western sweet-cicely) PerForb, uncom in oak, pinyon-juniper, montane conifer, & wetlands, May-Jul. Roots have a strong smell of licorice.
1. Fruits covered by short, hair-like bristles, strongly tapered at the base and widest at tip; flowers white or greenish-white . . . . . **O. depauperata** Phil. (Blunt sweet-cicely) PerForb, uncom in pinyon-juniper, oak, montane conifer, & wetland sites. Jun-Jul.

**Torilis** (Hedge-parsley)

**T. arvensis** (Huds.) Link (Field hedge-parsley) AnnForb, uncom in disturbed areas. Introduced, native to Europe, May-Jul.

## Apocynaceae (Dogbane and Milkweed Family)

Includes Asclepiadaceae

1. Flowers with a corona of 5 petal-like hoods above the reflexed petals and sepals; stamens united by their anthers to form a cone attached to the stigma; follicles broad or lance-shaped (Asclepiadaceae)
2. Plants woody vines with twining stems; flowers in a panicle, brownish-purple, corolla lobes spreading; corona with 5 slender, curved appendages, not hood-like . . . . . **Periploca**
2. Plants herbaceous perennials with erect, not twining stems; flowers in a compound umbel; white, yellow-orange, green, purple, or pink, corolla lobes reflexed; corona with hood-like appendages, often enclosing a short, curved horn . . . . . **Asclepias**
1. Flowers without a corona of petal-like hoods, corolla erect or spreading but not deflexed; stamens not united by their anthers, follicles paired, linear (Apocynaceae *sensu stricto*)
3. Flowers white or pink, in axillary or terminal cymes; stems erect . . . . . **Apocynum**
3. Flowers blue or purple, occurring singly in leaf axils; stems trailing . . . . . **Vinca**

### **Apocynum** (Dogbane)

1. Corolla usually at least 5 mm long, pinkish, lobes spreading or reflexed, often more than twice as long as the calyx; leaves drooping . . . . . **A. androsaemifolium** L. var. **androsaemifolium** (Spreading dogbane) PerForb, uncom in sagebrush, oak, pinyon-juniper, montane conifer, & wetlands. Jun-Aug.
1. Corolla less than 5 mm long, greenish-white to white, lobes erect or slightly spreading, usually less than twice the length of the calyx; leaves ascending . . . . . **A. cannabinum** L. (Common dogbane) PerForb, uncom in wetlands, Jun-Aug.

### **Asclepias** (Milkweed)

1. Leaves whorled or opposite, leaf blades 1-3 mm wide, linear, gradually tapering to a short petiole; flowers white (rarely purplish) . . . . . **A. subverticillata** (Gray) Vail (Whorled milkweed) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, & disturbed areas, May-Sep.
1. Leaves alternate to opposite but not whorled, leaf blades 4-80 mm wide, lance-shaped to broadly elliptic, usually widest at base and not gradually tapering to the petiole; flowers yellow-orange, green, purple, or pink
2. Flowers yellow-orange; stems with spreading coarse hairs; leaves narrowly lance-shaped, alternate, 4-8.5 cm long; plants without milky latex . . . . . **A. tuberosa** L. var. **interior** (Woodson) Shinners (Orange milkweed) PerForb, uncom in oak, pinyon-juniper, montane conifer, & wetlands, May-Aug.
2. Flowers green, purple, or pink; stems finely pubescent or scabrous but without spreading coarse hairs; leaves lance-shaped to broadly elliptic, 8-20 cm long; plants exude milky latex when cut
3. Leaves alternate, blades mostly 8-35 mm wide, alternate or opposite, linear to lance-shaped
4. Flowers yellowish-green to purple-tinged, column brownish-purple, petals curved upwards, hoods 8-10 mm long, lacking a horn; inflorescence a single, terminal umbel . **A. asperula** (Decs.) Woodson var. **asperula** (Spider milkweed) PerForb, uncom in warm desert, pinyon-juniper, oak, sagebrush, & montane conifer, May-Jul.
4. Flowers pink or purple, column white to pinkish-cream, petals spreading, hoods 5-6 mm long with a short horn; inflorescence of two to several umbels in axils of upper leaves . . . . . **A. hallii** Gray (Hall's milkweed) PerForb, uncom in pinyon-juniper, oak, and Ponderosa pine, Jun-Aug.
3. Leaves opposite or nearly so, blades 35-90 mm wide, broadly lance-shaped to oval
5. Corolla 7-10 mm long, pale yellowish-green; hoods 3.5-5 mm long, truncate; leaf tips acuminate and finely and irregularly toothed . . . . . **A. erosa** Torr. in Emory (Desert milkweed) PerForb, rare in desert shrub in Huber Wash, Jun-Jul.
5. Corolla 8-15 mm long, purple or pink; hoods 10-13 mm long, tapered to a long beak; leaf tips acute or rounded, smooth . . . . . **A. speciosa** Torr. (Showy milkweed) PerForb, uncom in wetlands, May-Aug.

### **Periploca** (Silk-vine)

- P. graeca** L. (Silk-vine) PerForb, rare, introduced (native to Europe), known only from Zion housing area, may no longer be present. May-Aug.

### **Vinca** (Periwinkle)

- V. major** L. (Grave-myrtle) PerForb, uncom in housing area in Zion and Oak canyons, Introduced from Europe, Apr -Jun.

**Araceae** (Arum Family)  
Includes Lemnaceae (duckweeds)

**Lemna** (Duckweed)

1. Fronds 3-6 mm long, broadly elliptic to nearly round, upper surface faintly 3-veined . . . . . **L. minor** L.  
(Lesser duckweed) PerForb, Historic (*L. turionifera*), aquatic, Jun-Oct.
1. Fronds 1-2.5 mm long, narrowly oval to elliptic, upper surface faintly 1-veined . . . . . **L. minuta** H.B.K.  
(Tiny duckweed) PerForb, Historic, aquatic, Jun-Sep (*L. minuscula*).

**Araliaceae** (Ginseng Family)

1. Vines; leaves simple, margins entire . . . . . **Hedera**
1. Perennial forbs; leaves pinnately to ternately compound, margins toothed . . . . . **Aralia**

**Aralia** (Spikenard)

**A. racemosa** L. **ssp. bicrenata** (Woot. & Standl.) Welsh & Atwood (Spikenard) PerForb, rare in wetlands, Jun-Aug.

**Hedera** (English ivy)

**H. helix** L. (English ivy) Vine; uncom in housing area; introduced, native to Europe, Sep-Oct.

**Asparagaceae** (Yucca Family)

Includes Agavaceae, Convallariaceae, Themidaceae and some genera formerly in Liliaceae

1. Plants subshrubs or woody at base, leaves thick, evergreen, either sword-like with fibrous margins and sharp tips or grass-like with serrated margins and blunt tips; fruit a woody capsule or papery with 3 broad wings (Agavaceae)
  2. Flowers over 2.5 cm long, tepals thick and succulent; fruit capsules over 3.5 cm long, woody to fleshy at maturity, lacking wings; leaves sharp-pointed at tips . . . . . **Yucca**
  2. Flowers less than 0.5 cm long, tepals not succulent; fruit capsules less than 0.8 cm long, papery at maturity, with 3 broad wings; leaves blunt at tips . . . . . **Nolina**
1. Plants herbaceous and not woody at base, leaves not thick or evergreen (dying back each year), grass-like, scale-like, or with expanded blades; fruit a berry or capsule but not woody (“Liliaceae”)
  3. Leaves minute and scale-like; stems multi-branched from thick tuberous roots . . . . . **Asparagus**
  3. Leaves not scale-like; stems simple or sparingly branched, from scaly bulbs, corms, rhizomes, or non-tuberous roots
    4. Leaves broadly oval or elliptic to lance-shaped, borne along the stem; inflorescence a raceme or dense panicle, not subtended by membranous or leaf-like bracts . . . . . **Maianthemum**
    4. Leaves slender, grass-like, all basal; inflorescence an umbel subtended by membranous or leaf-like bracts or a spike-like raceme of drooping, tubular flowers
      5. Flowers white, base of tepals fused into a tube 5-8 cm long, tepal lobes star-like and widely spreading (never urn-like); inflorescence stalkless and borne among basal leaves . . . . . **Leucocrinum**
      5. Flowers blue, purple, white, or pink, tepals separate nearly to the base with lobes erect and cup-like, or if fused then urn-like and drooping; inflorescence with long stalks elevating the flowers well above the basal leaves
        6. Tepals fused into a drooping, urn-shaped tube; filaments of anthers not united into a tube; inflorescence a spike-like raceme . . . . . **Muscari**
        6. Tepals fused below base, flowers cup-shaped and erect; filaments of anthers united into a tube; inflorescence an umbel (Themidaceae)
          7. Flowering stems 30-60 cm tall; individual flower stalks 1-15 mm long, flowers congested into a ball-like head; fruiting capsules oval-shaped, 4-6 mm long . . . . . **Dichelostemma**
          7. Flowering stems 10-30 cm tall; individual flower stalks 15-22 cm long, flowers not congested into a ball-like head but in an obvious umbel; fruiting capsules globe-shaped, 10-15 mm long . . . . . **Androstephium**

**Androstephium** (Funnel-lily)

**A. breviflorum** Watson (Pink funnel-lily) PerForb, uncom in sand or clay in warm desert shrub & pinyon-juniper, Apr-May. Type locality from Kanab, UT.



**Asparagus** (Asparagus)

**A. officinalis** L. (Asparagus) PerForb, uncom in wetlands & disturbed areas, May-Jun, introduced from Eurasia.

**Dichelostemma** (Bluedicks)

**D. pulchellum** (Salisb.) Heller (Bluedicks) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, montane conifer, & wetlands, Mar-May (*D. capitatum* ssp. *pauciflorum*).

**Leucocrinum** (Star-lily)

**L. montanum** Nutt. ex Gray (Star-lily) PerForb; Reported by Ott (2010), pinyon-juniper, Apr-Jun.

**Maianthemum** (False Solomon's-seal)

1. Inflorescence a few-flowered raceme; tepals 5-7 mm long, longer than the stamens . . . . . **M. stellatum** (L.) Link (Starry false Solomon's-seal) PerForb, uncom in pinyon-juniper, oak, montane conifer, & wetlands, Apr-Jun (*Smilacina stellata*).

1. Inflorescence a many-flowered panicle; tepals 1-2 mm long, shorter than the stamens . **M. racemosum** (L.) Link (False Solomon's-seal) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, May-Jul (*Smilacina racemosa*).

**Muscari** (Grape hyacinth)

**M. botryoides** (L.) Miller (Grape hyacinth) PerForb, documented in Lava Point area of Zion by Derrick Zobell in 2014, probably escaped from cultivation, native to Europe, Apr-May.

**Nolina** (Beargrass)

**N. microcarpa** Wats. (Beargrass) Shrub, Extirpated in Zion NP (last reported in 1928). May-Jul.

**Yucca** (Yucca)

1. Fruits fleshy at maturity, indehiscent; leaves swordlike, over 2.5 cm wide; stalk of inflorescence shorter than the basal rosette of leaves

2. Leaves dark green, fibers on margins coarse and broad; top of inflorescence as long as or usually longer than the basal rosette of leaves, main stalk of the inflorescence usually green . . . . . **Y. baccata** Torrey in Emory (Datil yucca or Banana yucca) Shrub, uncom in pinyon-juniper, oak, and montane conifer, Apr-Jun (*Y. baccata* var. *baccata*).

2. Leaves bluish-green, fibers on margins fine and wiry; top of inflorescence typically shorter than the basal rosette of leaves, main stalk of the inflorescence reddish . . . . . **Y. vespertina** (McKelvey) Welsh (Mohave datil) Shrub, rare in warm desert and pinyon-juniper/oak woodlands, Apr-Jun (*Y. baccata* var. *vespertina*).

1. Fruits dry and dehiscent; leaves flexible and grasslike, less than 2 cm wide; stalk of inflorescence longer than the basal rosette of leaves

3. Inflorescence a branched panicle . . . . . **Y. utahensis** McKelvey (Utah yucca) Shrub, common throughout park in warm desert, pinyon-juniper, oak, sagebrush, & montane conifer, Apr-Jun (*Y. elata* var. *utahensis*). Type locality from Santa Clara, UT.

3. Inflorescence a raceme

4. Flowers 4.5-5.5 cm long; fruiting capsules 3-4.2 cm long, deeply constricted (shaped like a peanut fruit) . . . . . **Y. angustissima** Engelm. ex Trelease (Narrow-leaved yucca) Shrub, uncom in Huber Wash in warm desert scrub, also known from pinyon-juniper and montane conifer outside park, May-Jul (*Y. angustissima* var. *angustissima*)

4. Flowers 5.5-6.5 cm long; fruiting capsules 4.5-7.5 cm long and only moderately constricted . . . . . **Y. kanabensis** McKelvey (Kanab yucca) Shrub, uncom in sandy pinyon-juniper, oak, sagebrush, and montane conifer, May-Jul (*Y. angustissima* var. *kanabensis*).

**Aspleniaceae** (Spleenwort Family)

**Asplenium** (Spleenwort)

1. Leaves once-pinnately compound, leaflets mitten-shaped and lobed, largest at middle of leaf blade (becoming smaller towards tip and base of blade) . . . . . **A. resiliens** Kunze (Ebony spleenwort) Fern, uncom in rock crevices in warm desert & pinyon-juniper.

1. Leaves 2-3 times pinnately compound, leaflets sharply toothed, largest at base of leaf blade . . . . . **A. adiantum-nigrum** L. (Black spleenwort) Fern, rare in rock crevices.

**Asteraceae or Compositae (Sunflower Family)**

1. Plants woody shrubs . . . . . Group 1
1. Plants herbs, never woody or only at the very base (if woody at base, typically with a single main stem rather than a bushy growth form)
  2. Flower heads consist only of petal-like ray flowers (tubular disk flowers are not present at center of head); stems or leaves usually bleed white, milky juice when broken . . . . . Group 2
  2. Flower heads consist of both petal-like ray flowers and tubular disk flowers or only of tubular disk flowers; stems or leaves do not bleed white, milky juice when broken
    3. Flower heads consist only of tubular disk flowers, ray flowers lacking . . . . . Group 3
    3. Flower heads consist of both petal-like ray flowers and tubular disk flowers
      4. Ray flowers yellow, orange, or reddish . . . . . Group 4
      4. Ray flowers white, pink, purple, or blue . . . . . Group 5

**Group 1: Woody Shrubs**

1. Flower heads with both ray and disk flowers
  2. Leaves broadly egg-shaped to triangular, petiole obvious; pappus lacking or occasionally of 2 short hairy awns; receptacle with chaffy scales associated with each disk flower . . . . . **Encelia**
  2. Leaves narrowly linear, tapering at base to a petiole-like base or sessile; pappus of numerous hair-like bristles or 1-3 rows of broad whitish scales; receptacle lacking chaffy scales
    3. Flower heads 2-6 mm long; ray flowers 2-3 mm long . . . . . **Gutierrezia**
    3. Flower heads 8-10 mm long; ray flowers 8-15 mm long . . . . . **Ericameria**
1. Flower heads with disk flowers only
  4. At least some leaves three-lobed or pinnately lobed near the base, if entire then leaves all narrowly linear; pappus absent or of broad, membranous scales; flowers mostly greenish or brown (yellow in *Sphaeromeria*)
    5. Flower heads of two types: staminate (male) heads terminal, consist of a single row of involucre bracts that are fused at the base, pistillate (female) heads with a single flower surrounded by 2 or more rows of hardened, membranous, spreading wings . . . . . **Ambrosia**
    5. Flower heads of one type, usually with both staminate and pistillate flowers in the same head, each with 2-several rows of erect, membranous involucre bracts lacking spreading wings
      6. Plants woody at base; upper leaves entire, lower leaves usually deeply 3-5 lobed well below the tips . . . . . **Sphaeromeria**
      6. Plants woody throughout; leaves entire to three-lobed at the tips only . . . . . **Artemisia**
  4. Leaves uniformly simple, entire (oval to linear) or toothed on margins but not three-lobed at tips; pappus of numerous hair-like (capillary) bristles; flowers yellow, white, or pinkish
    7. Flower heads unisexual and plants dioecious (separate male and female plants) . . . . . **Baccharis**
    7. Flower heads bisexual and plants not dioecious
      8. Flowers white, bluish-white, pale yellow, or pale greenish
        9. Involucre bracts longitudinally striped; leaves toothed and broadest at base or if entire and tapering to the base then the innermost involucre bracts not ciliate . . . . . **Brickellia**
        9. Involucre bracts not longitudinally striped, innermost bracts ciliate on margins; leaves entire and tapering to base . . . . . **Pluchea**
      8. Flowers bright yellow
        10. Involucre bracts only 4-6 and in a single series; stems spiny or not . . . . . **Tetradymia**
        10. Involucre bracts more than 6, in 2 or more series; stems not spiny
          11. Involucre bracts round-tipped with broad, membranous margins; pappus of awn-like scales; leaves 1-2 cm long, blades narrowly oblanceolate . . . . . **Acamptopappus**
          11. Involucre bracts acute to blunt-tipped, without a broad, membranous margin; pappus of capillary bristles; leaves 1.5-8 cm long, linear to oblong
            12. Stems wand-like, not branched below the inflorescence; stems glabrous or finely hairy but not glandular or with felt-like matted hairs; leaves 3 veined . . . . . **Chrysothamnus scopulorum**
            12. Stems branched throughout, not wand-like; stems glandular, finely hairy, densely tomentose and felt-like, or glabrous; leaves 1-veined (3-5 veined in *Ericameria nauseosa* var. *graveolens*)
              13. Flower heads solitary at ends of stems, partially obscured by upper leaves . . . . . **Ericameria zionis**
              13. Flowers head 2 to many at tips of stems, located well above the leaves
                14. Stems glabrous or pubescent but not obscured by felt-like tomentum . . . . . **Chrysothamnus** (*sensu stricto*)
                14. Stems obscured by felt-like tomentum . . . . . **Ericameria**



5. Leaves mostly along stem, basal rosette lacking; flower heads bisexual; plants annual or short-lived perennial with taproot
6. Annual with stems mostly 3-15 cm tall; involucre 2.5-4 mm long, shorter than or equal in size to the uppermost leaves; clusters of heads commonly surpassed or equaled by leafy bracts. . **Gnaphalium**
6. Perennial with stems mostly over 20 cm tall; involucre 4-7 mm long, usually longer than the uppermost leaves . . . . . **Pseudognaphalium**
2. Stems and leaves not white-woolly; involucre bracts green, not membranous
7. Involucre bracts burr-like, spine-tipped, or with spreading, stiff, comb-like hairs; plants often thistle-like
8. Involucre bracts burr-like and hooked at tip; leaves triangular, simple, margins finely toothed, blades with heart-shaped bases
9. Flower heads all alike, bisexual; involucre bracts all separate; flowers pink or purplish, not enclosed by involucre . . . . . **Arctium**
9. Flower heads unisexual; pistillate heads much larger than staminate heads, with bracts fused together and enclosing the flowers within a hard shell covered with stout, hooked spines; involucre bracts of staminate heads separate . . . . . **Xanthium**
8. Involucre bracts spiny or with spreading, comb-like hairs; leaves pinnately divided or simple with spiny teeth and tapering at the base
10. Flower heads unisexual; involucre bracts of staminate flower heads united at base; involucre bracts of pistillate heads spiny; leaves pinnately lobed but not spiny-toothed . . . . . **Ambrosia**
10. Flower heads bisexual; involucre bracts all spine-tipped or with spreading, comb-like hairs; leaves pinnately lobed or entire, with or without spiny teeth
11. Leaves not spiny-margined . . . . . **Centaurea**
11. Leaves spiny-margined
12. Pappus bristles feathery . . . . . **Cirsium**
12. Pappus bristles hair-like or minutely barbed, but not feathery
13. Stems spiny nearly throughout; flower heads erect, several per stem; receptacle fleshy and conspicuously honeycombed (visible when flowers removed) . . . . . **Onopordum**
13. Stems not spiny (or only on leaf bases); flowers nodding, often occurring singly; receptacle not fleshy or honeycombed . . . . . **Carduus**
7. Involucre bracts not burr-like, spiny, nor with stiff, comb-like hairs; plants not thistle-like
14. Pappus of hair-like (capillary) or feathery (plumose) bristles
15. Leaves opposite or whorled, at least on lower stem; plants perennial
16. Achenes 10-ribbed or nerved; involucre bracts longitudinally striped . . . . . **Brickellia**
16. Achenes 5-nerved; involucre bracts not longitudinally striped . . . . . **Ageratina**
15. Leaves alternate throughout or all basal; plants annual or perennial
17. Leaves deeply pinnately lobed and irregularly toothed; involucre bracts in one main row subtended by small, irregular, black-tipped bracts . . . . . **Senecio vulgaris**
17. Leaves entire; involucre bracts in 2-several overlapping rows, not subtended by irregular, black-tipped bracts
18. Stems erect, simple, 10-150 cm tall; leaves linear to oblanceolate, non-glandular; involucre 2-4 mm long . . . . . **Conyza**
18. Stems branched, forming low mounds to 15 cm tall; leaves elliptic to ovate or rhombic, glandular; involucre 5 mm or more long
19. Leaves ovate or rhombic, abruptly tapered to a long petiole; annual forb . . . . . **Psathyrotes**
19. Leaves narrowly elliptic, sessile or gradually tapering to base but without a distinct petiole; matted perennial forb . . . . . **Isocoma**
14. Pappus of scales, awns, small teeth, or lacking
20. Disk black, on an elongated receptacle . . . . . **Rudbeckia**
20. Disk greenish-brown, yellow, white, or pinkish, not on an elongated receptacle
21. Leaves pinnately compound or pinnately lobed, usually divided into narrow, linear segments
22. Disk flowers yellow; involucre bracts membranous on margins
23. Leaves opposite, mostly on stem, essentially glabrous; involucre glabrous . . . . . **Thelesperma**
23. Leaves on stem alternate, mostly in a basal rosette, mostly densely white-woolly; involucre woolly . . . . . **Hymenopappus**
22. Disk flowers white, pink, or greenish-brown; involucre bracts not membranous on margins
24. Flowers white or pink; involucre 5-18 mm long; heads few (1-3) per stem; pappus of broad, membranous scales . . . . . **Chaenactis**
24. Flowers greenish-brown; involucre 2.5-5 mm long; heads numerous in an elongated panicle; pappus lacking or of short teeth . . . . . **Artemisia**
21. Leaves simple with entire or toothed margins

- 25. Plants annual, strongly tar-scented; stems simple and unbranched, at least at the base; flower heads narrowly spindle-shaped; flowers yellow or reddish . . . . . **Madia**
- 25. Plants perennial, may be aromatic but not tar-scented; stems multi-branched and woody from the base; flower heads bell or globe-shaped; flowers yellow or greenish-brown
- 26. Leaves coarsely toothed or lobed, triangular, maple-like; disk flowers yellow, corollas 4-lobed . . . . . **Perityle**
- 26. Leaves mostly all entire and linear (rarely some deeply 3-lobed in *Artemisia*); disk flowers greenish-brown, corollas 5-lobed
- 27. Flower heads nearly sessile, usually drooping, in a spike-like raceme; lower leaves opposite, all entire; stems 10-60 cm long . . . . . **Iva**
- 27. Flowers heads on short stalks, mostly erect, in an elongate panicle; lower leaves alternate, some often deeply three-lobed or entire; stems usually 50-150 cm long . . . . . **Artemisia**

**Group 4: Herbs with flower heads of ray and disk flowers; ray flowers yellow, orange, or reddish**

- 1. Pappus partly or entirely of hairlike (capillary) bristles; receptacle lacking chaffy scales or bristles at the base of disk flowers
  - 2. Stem leaves opposite . . . . . **Arnica**
  - 2. Stem leaves alternate or leaves all basal
    - 3. Involucre bracts in a single series, essentially equal in size (though often subtended by very short, linear bracts at base of head); leaves entire or pinnately lobed or divided ( *Senecio, sensu lato*)
    - 4. Leaves all about the same size or uppermost leaves only slightly smaller than lower leaves; basal rosette absent . . . . . **Senecio**
    - 4. Lower stem leaves much larger than upper leaves; basal rosette present
      - 5. Basal and stem leaves entire or shallowly toothed but not lobed . . . . . **Senecio**
      - 5. Basal leaves or stem leaves deeply lobed . . . . . **Packera**
  - 3. Involucre bracts in two or more overlapping rows and unequal in size; leaves entire
    - 6. Flower heads 3-5 mm long, numerous in elongate panicles or ball-like clusters at the tips of branches; ray flowers 1.5-3 mm long
      - 7. Leaves punctate (with numerous, embedded glands), narrowly linear and entire; flower heads arranged in small, somewhat compact, clusters . . . . . **Euthamia**
      - 7. Leaves not punctate, elliptic to oval and often coarsely toothed; flower heads in elongate racemes or panicles . . . . . **Solidago**
    - 6. Flower heads 5-13 mm long, 1-few per stem or in flat-topped terminal clusters; ray flowers 4-15 mm long
      - 8. Leaves spine-toothed on margins; annual or perennial . . . . . **Xanthisma**
      - 8. Leaves entire-margined, plants perennial
        - 9. Leaves all of similar size, restricted to the stem; outer pappus bristles much shorter than the inner bristles . . . . . **Heterotheca**
        - 9. Leaves in basal rosette larger and longer than those of the stem; pappus bristles uniformly the same size
          - 10. Flower heads slender and cylindrical with 1-5 sterile disk flowers and 2-3 ray flowers; involucre bracts uniformly green . . . . . **Petradoria**
          - 10. Flower heads broadly oval with more than 5 fertile disk flowers and more than 7 ray flowers; involucre bracts with a dark green spot at tip . . . . . **Stenotus**
  - 1. Pappus of broad, membranous scales, firm pointed awns, or lacking; receptacle of chaffy scales or bristles at the base of disk flowers (or naked)
    - 11. Receptacle chaffy or bristly
      - 12. Ray flowers deeply divided at the tip into three deep lobes; receptacle bristly, not chaffy . . . . . **Gaillardia**
      - 12. Ray flowers minutely 3-toothed at tip but not deeply 3-lobed; receptacle chaffy
        - 13. Receptacle elongated and cylindrical; ray flowers pointing backwards; stem leaves deeply pinnately lobed . . . . . **Ratibida**
        - 13. Receptacle round, not elongated and cylindrical; ray flowers spreading or erect; stem leaves simple, entire or toothed but not pinnately lobed
          - 14. Leaves mostly all basal, blades cordate at base and woolly-pubescent; stem leaves reduced to small bracts . . . . . **Balsamorhiza**
          - 14. Leaves along stem and at base, blades not both cordate and woolly-pubescent
            - 15. Stem leaves all alternate; plants perennial . . . . . **Wyethia**
            - 15. Leaves on lower portion of stem opposite; plants annual or perennial
              - 16. Pappus absent; disk 6-15 mm wide, yellow . . . . . **Heliomeris**
              - 16. Pappus of awns or scales (can be deciduous); disk 6-25 mm wide, yellow, red, or purple
                - 17. Leaves coarsely toothed, wavy-margined, or entire; plants annual or perennial; achenes thick and 4-sided; pappus awns readily deciduous; disk yellow or red . . . . . **Helianthus**

- 17. Leaves all entire; plants perennial; achenes strongly flattened and 2-sided; pappus awns usually persistent; disk yellow or purple . . . . . **Helianthella**
- 11. Receptacle naked (or with a single row of bracts at the margin in *Madia*)
- 18. Involucre and leaves with sessile, dot-like oil glands
  - 19. Plants perennial; involucre bracts in 2 rows . . . . . **Thymophylla**
  - 19. Plants annual; involucre bracts in 1 row . . . . . **Pectis**
- 18. Involucre and leaves without sessile, dot-like oil glands
  - 20. Ray flowers inconspicuous, to 2 mm long; flower heads narrowly spindle-shaped; plants annual, strongly tar-scented . . . . . **Madia**
  - 20. Ray flowers usually conspicuous, 3-20 mm; flower heads globe or bell-shaped; plants annual or perennial, may be aromatic but not tar-scented
    - 21. Outer involucre bracts strongly recurved, resinous but not woolly; leaves simple, with finely saw-toothed margins; pappus of 2 to several deciduous awns . . . . . **Grindelia**
    - 21. Outer involucre bracts erect, often obscured by woolly pubescence or green and glandular; leaves entire, irregularly lobed, pinnately divided, or pinnately compound; pappus of membranous scales or lacking
      - 22. Plants annual; ray flowers 2-6 mm long . . . . . **Eriophyllum**
      - 22. Plants biennial or perennial; ray flowers 10-20 mm long
        - 23. Plants densely white woolly; stems leafy, leaves pinnately lobed into broad, non-linear segments; pappus none; achenes glandular . . . . . **Baileya**
        - 23. Plants glandular, glabrous, or woolly only at the base of the stem; stems leafy or leaves all basal, leaves entire, pinnately compound, or deeply three-parted into narrow, linear segments; pappus of membranous scales or lacking; achenes hairy but not glandular or glabrous
          - 24. Plants glandular, leaves pinnately compound; pappus lacking . . . . . **Amauriopsis**
          - 24. Plants glabrous or woolly at the base of the stem; leaves entire or deeply three-parted into narrow linear segments; pappus of membranous scales
            - 25. Perennial from a woody caudex; basal leaves entire . . . . . **Tetraneuris**
            - 25. Biennial from a taproot; basal leaves pinnately divided . . . . . **Hymenoxys**

**Group 5: Herbs with flower heads of ray and disk flowers; ray flowers white, pink, purple, or blue**

- 1. Leaves opposite, pinnately compound; pappus of 2-4 sharp awns with retrorse hairs; ray flowers white (yellow in other species outside of Zion NP) . . . . . **Bidens pilosa**
- 1. Leaves alternate, pinnately dissected or simple; pappus absent or of membranous scales, feathery awns, or hair-like (capillary) bristles; ray flowers white, pink, purple, or blue
  - 2. Leaves finely pinnately dissected into short, thread-like segments, sessile or only the basal leaves with a short petiole; receptacle chaffy throughout; ray flowers white, mostly 3-5 per head; pappus lacking . . . . . **Achillea**
  - 2. Leaves simple with entire or shallowly lobed or toothed margins, sessile or petioled; receptacle naked (with a single row of bracts along the margin of the head in *Layia*); ray flowers white, pink, purple or blue, mostly more than 5 per head; pappus usually present
    - 3. Pappus of membranous scales, tooth-like awns, or feathery awns, or lacking; ray flowers white
      - 4. Plants annual; leaves entire or lobed near the tips; pappus of awns with a feathery and woolly base . . . **Layia**
      - 4. Plants perennial; leaves coarsely toothed; pappus of short membranous scale or lacking . . . . . **Chrysanthemum**
    - 3. Pappus of numerous smooth or finely barbed, hair-like (capillary) bristles (at least on the disk flowers); ray flowers white, blue, purple, or pink
      - 5. Plants annual with a taproot
        - 6. Leaves pinnately dissected, fern-like; involucre 6-10 mm long; ray flowers blue, 10-16 mm long . . . . . **Machaeranthera tanacetifolia**
        - 6. Leaves simple with entire or slightly toothed margins, linear; involucre 2-4 mm long; ray flowers white or pinkish, 0.5-1 mm long . . . . . **Conyza**
      - 5. Plants biennial or perennial with a branched woody rootstalk, rhizome, or occasionally a taproot.
        - 7. Involucre bracts recurved or reflexed at the tip, green tips much shorter than the papery base; ray flowers bluish-purple . . . . . **Machaeranthera canescens**
        - 7. Involucre bracts straight at tip, not recurved or reflexed, bracts green throughout or with membranous margins or papery bases; ray flowers white, blue, or purple
          - 8. Plants forming dense to loose mats, stems short, leafy, densely white pubescent with appressed, straight hairs; pappus bristles minutely barbed; achenes with minutely hooked hairs . . . . . **Townsendia**
          - 8. Plants with mostly erect leafy stems (though sometimes with leaves mostly at the base), glabrous or pubescent with appressed or spreading hairs but rarely densely white pubescent (*Erigeron utahensis*); pappus bristles smooth; achenes glabrous or pubescent with straight, unbranched hairs

9. Involucre bracts nearly all of equal size, mostly arranged in a single row (occasionally in two rows in *Erigeron utahensis*); ray flowers usually numerous and narrow . . . . . **Erigeron**
9. Involucre bracts of unequal size, arranged in two or more overlapping rows; ray flowers usually relatively few and wide
10. Involucre bracts green with thin hyaline margins; ray flowers white or faintly pink; leaves linear to linear-oblong, 6-20 mm long and less than 2.5 mm wide . . . . . **Chaetopappa**
10. Involucre bracts non-green and papery or membranous or green and herbaceous without hyaline margins; leaves oblanceolate to elliptic or linear, mostly well over 25 mm long and 2.5 mm wide, "Aster"
11. Involucre bracts with papery or membranous non-green blunt tips; stems and leaves bluish-green (glaucous); leaves mostly broadly oval . . . . . **Herrickia**
11. Involucral bracts green and herbaceous at tips or throughout, tips pointed or spine-like; stems and leaves green, not glaucous, mostly narrowly linear . . . . . **Symphotrichum**

**Acamptopappus** (Goldenhead)

**A. sphaerocephalus** (Harvey & Gray) Gray (Goldenhead) Shrub, uncom in warm desert shrub, Apr-May.

**Achillea** (Yarrow)

**A. millefolium** L. var. **lanulosa** (Nutt.) Piper (Common yarrow) PerForb, uncom in sagebrush, pinyon-juniper, oak, montane conifer, & wetlands, May-Sep (*A. lanulosa*).

**Acourtia** (Perezia)

**A. wrightii** (Gray) Reveal & King (Wright's perizia) PerForb, uncom in warm desert shrub, May-Nov (*Perezia wrightii*).

**Ageratina** (Thoroughwort)

**A. herbacea** (Gray) King & Robins. (White thoroughwort) PerForb, uncom in pinyon-juniper/oak & montane conifer, Aug-Oct (*Eupatorium herbaceum*).

**Agoseris** (Mountain dandelion)

1. Flowers orange (often drying purplish); beak of mature achenes 1-1.5 times as long as the body . . . . . **A. aurantiaca** (Hook.) Greene var. **purpurea** (Gray) Cronq. (Purplish agoseris) PerForb, uncom in montane conifer sites, Jun-Aug.
1. Flowers yellow (often drying bluish to pinkish); beak of mature achene either 0.5-1 times as long as the body or 2-4 times longer than the body
  2. Beak of mature achene 2-4 times longer than the body . . . . . **A. retrorsa** (Benth.) Greene (Retorse agoseris) PerForb, uncom in pinyon-juniper/oak, May-Jun.
  2. Beak of mature achene less than 2 times as long as the body . . . . . **A. glauca** (Pursh) Raf.
    3. Leaves narrowly lance-shaped with scattered, backward-pointing teeth; beak of mature achene 1/2-1 times as long as the body . . . . . var. **laciniata** (D.C. Eaton) Smiley (Cutleaf agoseris) PerForb, uncom in sagebrush, pinyon-juniper, oak, and montane conifer, May-Sep (*A. parviflora*).
    3. Leaves broadly elliptic, mostly all entire; beak of mature achene less than 1/2 as long as body . . . . . var. **dasycephala** (Torr. & Gray) Jepson (Short agoseris) PerForb, rare in pinyon-juniper or montane conifer, May-Sep.

**Amauriopsis** (Bahia)

**A. dissecta** (Gray) Rydb. in Britt. (Ragleaf bahia) PerForb; uncom, Ponderosa pine shrubland, known only from Kolob Terrace area, Aug-Sep (*Bahia dissecta*).

**Ambrosia** (Ragweed, Burrobush) includes *Hymenoclea*

1. Perennial shrubs; leaves 1 mm wide, entire to minutely toothed; fruits within membranous wings (*Hymenoclea*) . . . . . **A. salsola** (Torrey & Gray) Strother & Baldwin (Burrobush) Shrub, uncom in desert shrub, Mar-Jun (*Hymenoclea salsola*).
1. Annual or perennial forbs; leaves over 5 mm wide, pinnately lobed and coarsely toothed; fruits within a spiny burr or smooth, but wingless (*Ambrosia*)
  2. Annual with taproot; fruits and pistillate flowers with numerous spines 2-5 mm long . **A. acanthicarpa** Hook. (Bur ragweed) AnnForb, com in disturbed areas, Jul-Oct (*Franseria acanthicarpa*).
  2. Perennial with creeping rootstalk; fruits and pistillate flowers smooth, or with a single row of bumpy knobs, or if spiny the spines 1-2 mm long

3. Leaves on lower stem opposite, once-pinnately lobed; fruits and pistillate flowers smooth or with a single row of bumpy knobs, not spiny . . . . . **A. psilostachya** DC. (Western ragweed) PerForb, uncom in disturbed areas, Aug-Oct.
3. Leaves alternate, usually 2-3 times pinnately lobed; fruits and pistillate flowers with spines 1-2 mm long . . . . . **A. confertiflora** DC. (Mexican ragweed), PerForb, rare in campground, Sep-Oct.

**Anaphalis** (Pearly everlasting)

**A. margaritacea** (L.) Benth. & Hook. (Pearly everlasting) PerForb, uncom in montane conifer and wetlands, Jul-Sep.

**Antennaria** (Pussytoes)

1. Upper leaf surface green, distinctly less pubescent than the underside, larger basal leaves often 8-15 mm wide, broadly spoon-shaped . . . . . **A. marginata** Greene (Sandstone pussytoes) PerForb, rare in pinyon-juniper on sandstone, May-Jul (included in *A. neglecta* by some authors).
1. Upper and lower leaf surfaces densely and equally pubescent with gray to white woolly hairs; larger basal leaves 2-8.5 mm wide, narrowly spoon-shaped to elliptic
2. Flowering stems less than 5 cm tall; heads often solitary (sometimes 2-3+ in *A. rosulata*), often borne among the basal leaves
3. Plants always with a single flowering head; densely matted and lacking stolons . . . . . **A. dimorpha** (Nutt.) Torr. & Gray (Low pussytoes) PerForb, uncom in warm desert, sagebrush, pinyon-juniper & montane conifer, Apr-Jun.
3. Plants with one to few flowering heads; loosely matted with short, leafy stolons . . . . . **A. rosulata** Rydb. (Breaks pussytoes) PerForb, Reported (Ott 2010), montane conifer. May-Jul.
2. Flowering stems over 5 cm tall; heads 3-several and borne on stems that well exceed the basal leaves
4. Involucre 4-7 mm high; pistillate corollas 2.5-5 mm long. . . . . **A. microphylla** Rydb. (Small-leaf pussytoes) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Jun-Aug (Includes pink-flowered forms, sometimes split out as a separate species, *A. rosea*).
4. Involucre 7-11 mm high; pistillate corollas 5-8 mm long . . . . . **A. parvifolia** Nutt. (Common pussytoes) PerForb, uncom in pinyon-juniper and montane conifer, May-Jul.

**Arctium** (Burdock)

**A. minus** (Hill) Bernh. (Burdock) PerForb, introduced from Eurasia, rare in disturbed areas & wetlands, Jul-Sep.

**Arnica** (Arnica)

1. Stems with more than 5 pairs of leaves, leaf blades entire to shallowly toothed, 1-4 cm wide, tapering to base or sessile; involucre bracts with tuft of white hairs at tip . . . . . **A. chamissonis** Less. **ssp. foliosa** (Nutt.) Maguire (Chamisso's arnica) PerForb, Uncom in wetlands, Jun-Aug.
1. Stems with 3-4 pairs of leaves, leaf blades coarsely toothed (rarely entire), 3-9 cm wide, heart-shaped at base and long-petioled (at least lowermost leaves); involucre without a tuft of white hairs at the tip . . . . . **A. cordifolia** Hook. **var. cordifolia** (Heartleaf arnica) PerForb, uncom in montane conifer forests, May-Aug.

**Artemisia** (Sagebrush)

1. Plants perennial forbs, woody only at the very base
2. Leaves all entire (rarely some lower leaves lobed), glabrous and green above and below . . . . . **A. dracunculus** L. **var. glauca** (Pall.) Jeps. (Tarragon) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, montane conifer, & wetlands, Jul-Oct (*Oligosporus dracunculus*).
2. Leaves entire or deeply lobed and pinnately divided or three-toothed at tip, green or whitish pubescent above and densely white woolly beneath
3. Stem leaves greatly reduced upwards, the largest leaves in a basal rosette, these silvery hairy to almost glabrous, uniformly colored above and below; plants from a caudex, not rhizomatous . . . . . **A. campestris** L. **var. scouleriana** (Besser) Cronq. (Sand wormwood) PerForb, Uncom in sandy soils, Jul-Sep (*Oligosporus campestris*).
3. Stem leaves not greatly reduced upwards, leaves predominantly located on stem, these usually woolly-tomentose below and green or grayish-pubescent above; plants rhizomatous



4. Leaves divided nearly to the midrib into narrow, linear, entire lobes 0.5-2 mm wide . . . . . **A. carruthii** Wood ex Carruth (Carruth's wormwood) PerForb, uncom in sagebrush grassland in Kolob Terrace area, Aug-Sep.
4. Leaves entire or variously lobed with leaflets over 2 mm wide
5. Inflorescence short and compact, involucre 4-4.5 mm long; leaves entire on upper stem and 3-5 lobed on lower stem . . . . . see **Sphaeromeria**
5. Inflorescence elongate and open; involucre 2.5-4 mm long; leaves entire or deeply pinnately lobed or dissected . . . . . **A. ludoviciana** Nutt.
6. Inflorescence narrow, usually less than 6 cm wide; leaves mostly entire or sometimes shallowly lobed . . . . . **var. ludoviciana** (Louisiana wormwood) PerForb, uncom in montane conifer forests, Jul-Oct.
6. Inflorescence broad, usually over 6 cm wide; leaves all deeply pinnately lobed or dissected
  7. Leaves mostly 1.5-5 cm long, margins often narrowly inrolled . . . . . **var. albula** (Woot.) Shinnery (Louisiana wormwood) PerForb, uncom in pinyon-juniper, sagebrush, oak, & wetlands, Jul-Oct.
  7. Leaves mostly 5-10 cm long, margins not inrolled . . . . . **var. mexicana** (Willd.) Fern. (Louisiana wormwood) PerForb, uncom in pinyon-juniper, oak, sagebrush, montane conifer, and wetlands, Jul-Oct.
1. Plants shrubs, stems woody throughout
  8. Leaves once to thrice pinnately dissected or deeply divided into narrow, linear segments
    9. Receptacle hairy between the flowers; subshrubs less than 40 cm tall with densely gray-pubescent foliage . . . . . **A. frigida** Willd. (Sand sagebrush) Subshrub, Reported by Ott (2010) in sagebrush, pinyon-juniper, Jun-Aug.
    9. Receptacle glabrous between the flowers; tall shrubs 50-120 cm tall with gray-pubescent, deeply divided foliage . . . . . **A. filifolia** Torr. (Sand sagebrush) Shrub, uncom in warm desert shrub, sagebrush, and pinyon-juniper communities on sandy soils, Aug-Oct (*Oligosporus filifolius*).
  8. Leaves entire or shallowly 3-lobed at the tips, segments short, rounded or wedge-shaped
    10. Involucre at anthesis glabrous to hairy only at base, shiny; inflorescence a narrow panicle less than 1.5 cm wide; plants mostly 1-4 dm tall . . . . . **A. nova** A. Nelson **var. nova** (Black sagebrush) Shrub, uncom in warm desert shrub and sagebrush communities, often on shallow or limestone soils, Aug-Oct (*Seriphidium novum*).
    10. Involucre at anthesis tomentose throughout, not shiny; inflorescence a panicle over 1.5 cm wide; plants 1-4 dm tall or well over 5 dm tall . . . . . **A. tridentata** Nutt.
    11. Plants over 1 m tall at maturity, uneven-topped, the flower stalks arising at different levels and not well set-off from the foliage . . . . . **var. tridentata** (Basin big sagebrush) Shrub, com in sagebrush & pinyon-juniper or oak, Jul-Sep (*Seriphidium tridentatum* ssp. *tridentatum*).
    11. Plants usually less than 1 m tall at maturity, appearing flat-topped, the flower stalks arising from about the same level at the top of the plant and well set off from the foliage . . . . . **var. vaseyana** (Rydb.) Boivin (Mountain big sagebrush) Shrub, montane sagebrush and brush communities, Jul-Sep.

**Baccharis** (Seepwillow)

1. Leaves elliptic, entire to coarsely few toothed, tapering to a wedge-shaped base; inflorescences elongate, terminal on main stem and on side branches; achenes with 8-10 ribs, pappus nearly twice as long or more as the involucre in fruit . . . . . **B. salicina** Torr. & Gray (Rio Grande seepwillow) Shrub, common in wetlands, May-Nov. (*B. emoryi*).
1. Leaves linear, willow-like, entire to finely toothed, not tapering to a wedge-shaped base, inflorescences short, ball-shaped, terminal on main stem or found on main stem and uppermost side branches; achenes with 4-5 ribs, pappus less than half as long as the involucre in fruit
  2. Leaves 1-6 cm long, mostly entire; inflorescences terminal on main branch and several of the upper branches . . . . . **B. viminea** DC. **var. viminea** (Mule-fat) Shrub, rare in wetlands, Mar-Jun (included in *B. salicina* by some authors).
  2. Leaves 6-12 cm long, mostly fine-toothed; inflorescences terminal on main branch (sometimes also on second-highest branch) . . . . . **B. salicifolia** (Ruiz & Pavon) Pers. (Sticky seepwillow) Shrub, uncom in wetlands, Jun-Oct (*B. glutinosa*).

**Baileya** (Desert marigold)

1. Leaves mostly in a basal rosette, some small leaves continuing up the stem; leafless flowering stalks 10-30 cm long; ray flowers 12-20 mm long . . . . . **B. multiradiata** Harv. & Gray (Desert marigold) PerForb, uncom in warm desert shrub, Apr-Sep.

1. Leaves mostly along the stem; leafless flowering stalks less than 10 cm long; ray flowers 7-11 mm long . . . . .  
 . . . . . **B. pleniradiata** Harv. & Gray  
 (Woolly desert-marigold), AnnForb (or short-lived PerForb), uncom in warm desert shrub, Apr-Jul.

**Balsamorhiza** (Balsamroot)

- B. sagittata** (Pursh) Nutt. (Arrowleaf balsamroot) PerForb, uncom in sagebrush & montane conifer, Apr-Jul.

**Bidens** (Beggar-ticks)

- B. pilosa** L. (Common beggars-ticks) AnnForb, uncom in campground, introduced (native to subtropical areas), Jun-Sep.

**Brickellia** (Brickellbush)

1. Herbs, sometimes woody at the base
  2. Leaves sessile, entire or nearly so, mostly 2-8 times as long as wide, alternate . . . . .  
 . . . . . **B. oblongifolia** Nutt. **var. linifolia** (D.C. Eat.) B.L. Robins.  
 (Mohave brickellbush) Shrub, locally common in Camp Creek Area, May-Jul
  2. Leaves petiolate, toothed, 1-2.5 times as long as wide, alternate or lower leaves opposite
    3. Flowers 20-40 per head; longest petioles over 24 mm long . . . . . **B. grandiflora** (Hook.) Nutt.  
 (Tassel-flower brickellbush) PerForb, uncom in pinyon-juniper, oak, & montane conifer, Jul-Oct.
    3. Flowers 8-12 per head; longest petioles less than 24 mm long . . . . . **B. californica** (Torr. & Gray) Gray  
 (California brickellbush) Shrub, uncom in rock crevices, Aug-Sep. Hybrids with *B. longifolia* are known from Zion NP.
1. Multi-branched shrubs
  4. Flowers 4-6 per head; leaves narrowly elliptic, entire, tapering to a nearly sessile base . . . . . **B. longifolia** Wats.  
 (Longleaf brickellbush) Shrub, uncom in washes Aug-Sep.
  4. Flowers 8-90 per head; leaves widest at base, coarsely toothed, sessile or petiolate
    5. Flowers 40-90 per head . . . . . **B. atractyloides** Gray  
 (Spiny brickellbush) Shrub, uncom in rock crevices, Apr-May.
    5. Flowers 8-30 per head
      6. Lower leaves with petioles 4-24 mm long, larger blades 20-80 mm long . . . . . **B. californica** (see couplet 3)
      6. Lower leaves with petioles 1-3 mm long, larger blades 5-20 mm long . . . . . **B. microphylla** (Nutt.) Gray **var. scabra** Gray  
 (Rough brickellbush) Shrub, uncom in warm desert shrub, sagebrush, and pinyon-juniper stands on sandstone, Aug-Oct.

**Carduus** (Musk thistle)

- C. nutans** L. (Musk thistle) PerForb, introduced (native to Eurasia), Utah state noxious weed, reported by Welsh (1995) and Dewey and Andersen (2005) from disturbed areas, Jun-Sep.

**Centaurea** (Knapweed or Starthistle)

1. Middle involucre bracts with long spines; flowers yellow; stems winged by decurrent leaf bases . . . **C. solstitialis** L.  
 (Yellow star-thistle) PerForb, Introduced from Europe, Utah state noxious weed, rare in disturbed areas, Jul-Sep (*Leucantha solstitialis*).
1. Middle involucre bracts with short, comb-like, pinnately arranged teeth; flowers pinkish-purple or white; stems not winged by decurrent leaf bases
  2. Tip of involucre bracts black-spotted; flower heads 10-15 mm high and 10-13 mm wide . . . . . **C. maculosa** Lam.  
 (Spotted knapweed) PerForb, introduced from Europe, Utah state noxious weed, uncom in disturbed areas, Jul-Sep (*Acosta maculosa*).
  2. Tip of involucre bracts not black-spotted; flower heads 8-10 mm high and 3-6 mm wide
    3. Flowers 5-8 per head; pappus present, bristles to 2.5 mm long . . . . .  
 . . . . . **C. virgata** Lam. **var. squarrosa** (Willd.) Boiss.  
 (Squarrose knapweed) PerForb, introduced from Eurasia, uncom in disturbed areas, Jun-Sep.
    3. Flowers more than 13 per head; pappus absent or if present bristles to 1 mm long . . . . . **C. diffusa** Lam.  
 (Diffuse knapweed) PerForb, introduced (native to the Mediterranean), Utah state noxious weed, uncom in disturbed areas, Jul-Sep (*Acosta diffusa*).

**Chaenactis** (Dusty-maiden)

1. Plants biennials or short-lived perennials; basal rosette well-developed; pappus scales 10-16 . . . . .  
 . . . . . **C. douglasii** (Hook.) Hook. & Arn.  
 (Hoary dusty-maiden) PerForb, common in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, May-Sep.

1. Plants annuals; basal rosette poorly developed (if at all); pappus scales 4 or 5 (rarely 8)
2. Heads mostly 15-22 mm long; flowers pink, much surpassing the involucre; anthers not exerted. . . . .  
 . . . . . **C. macrantha** D.C. Eat. in Watson  
 (Showy dusty-maiden) AnnForb, uncom in warm desert, Apr-Jun.
2. Heads mostly 8-10 mm long; flowers white or cream, only slightly surpassing the involucre; anthers exerted . . . .  
 . . . . . **C. stevioides** Hook. & Arn.  
 (Stevia dusty-maiden) AnnForb, uncom in warm desert, sagebrush, and pinyon-juniper, Apr-Jul.

**Chaetopappa** (Rose-heath)

**C. ericoides** (Torr.) Nesom (Rose-heath) PerForb, uncom in warm desert, sagebrush, pinyon-juniper/oak & montane conifer, May-Sep (*Leucelene ericoides*).

**Chrysanthemum** (Ox-eye daisy)

**C. leucanthemum** L. (Ox-eye daisy) PerForb, introduced (native to Eurasia), rare in disturbed areas, Jun-Sep (*Leucanthemum vulgare*).

**Chrysothamnus** (Rabbitbrush)

Includes *Hesperodoria* (formerly in *Haplopappus*)

1. Stems wand-like, not branched below the inflorescence; leaves 3 veined . . . . .  
 . . . . . **C. scopulorum** (Jones) Urbatsch, Roberts & Neubig  
 (Spindly goldenbush) Shrub, common in pinyon-juniper, oak, and montane conifer, Aug-Sep, (*Haplopappus scopulorum*, *Hesperodoria scopulorum*). Type locality from above Springdale.
1. Stems branched throughout, not wand-like; leaves 1-veined
2. Involucre 9-13 mm long, bracts sharp-tipped; achenes glabrous or finely glandular to hairy only at the tip; leaves mostly 1-2 cm long, erect or ascending . . . . . **C. depressus** Nutt.  
 (Dwarf rabbitbrush) Shrub, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane brush communities, Jul-Sep.
2. Involucre 4-8 mm long, bracts sharp-tipped or blunt-tipped; achenes short hairy throughout; leaves 1-6 cm long, usually spreading rather than strictly erect or ascending
3. Involucre bracts with long acuminate tips . . . . . **C. greenei** (Gray) Greene  
 (Greene's rabbitbrush) Shrub; Reported by Ott (2010) in warm desert, Jul-Sep.
3. Involucre bracts blunt-tipped . . . . . **C. viscidiflorus** (Hook.) Nutt.
4. Twigs and leaves minutely pubescent . . . . . **var. puberulus** (D.C. Eat.) Jeps.  
 (Puberulent rabbitbrush) Shrub, uncom in warm desert, pinyon-juniper and oak woodlands, sagebrush, and mountain conifer, Jul-Sep.
4. Twigs glabrous, leaves glabrous or with ciliate margins
5. Leaves 0.5-1.5 mm wide; plants mainly 2-3 dm tall . . . . . **var. stenophyllus** (Gray) Hall  
 (Slenderleaf rabbitbrush) Shrub, uncom in warm desert, pinyon-juniper woods, & sagebrush. Jul-Sep  
 (included in *var. viscidiflorus* by some authors).
5. Leaves mainly 1-4 mm wide; plants mainly 3-10 dm tall . . . . . **var. viscidiflorus**  
 (Green rabbitbrush) Shrub, Common in warm desert, pinyon-juniper, oak, sagebrush, & montane conifer, Jul-Sep.

**Cichorium** (Chicory)

**C. intybus** L. (Chicory) PerForb, uncom in disturbed areas, introduced from Eurasia, Jul-Oct.

**Cirsium** (Thistle)

1. Leaves short spiny and green on upper surface of leaves . . . . . **C. vulgare** (Savi) Tenore  
 (Bull thistle) PerForb, introduced (native to Europe), Uncom in disturbed areas & wetlands, Jul-Aug.
1. Leaves glabrous or thinly to densely hairy or white woolly on upper surface but not short spiny, white to gray or green
2. Basal rosettes over 6 dm wide, leaves over 10 cm wide . . . . . **C. joannae** Welsh & Atwood  
 (Joanna's thistle) PerForb, rare in wetlands & hanging gardens, Jun-Sep, endemic to Zion NP (type locality NE of Kolob Arch).
2. Basal rosettes less than 5 dm across, mature leaves less than 8 cm wide
3. Leaves glabrous or glabrate, green . . . . . **C. calcareum** (Jones) Woot. & Standl. **var. calcareum**  
 (Caineville thistle) PerForb, Reported by Welsh (1995) for wetland areas, Jun-Sep.
3. Leaves tomentose, floccose-tomentose, gray or white, or only the upper leaf surfaces green
4. Flower heads broadly round to bell-shaped, mainly 4-6.5 cm wide at flowering . . . **C. neomexicanum** Gray

5. Involucral bracts not green throughout, the sharp tips differing in color and texture from the base of the bract ..... **var. *utahense*** (Petrauk) Welsh (Utah thistle) PerForb, uncom in warm desert, sagebrush, and pinyon-juniper, May-Jun.
5. Involucral bracts green throughout, the sharp tips not differing in color or texture from the base of the bract ..... **var. *neomexicanum*** (New Mexico thistle) PerForb, uncom, sagebrush & pinyon-juniper, May-Jun.
4. Flower heads narrowly cylindrical, mainly 2.5-3.5 cm wide at flowering
6. Corollas bright red or carmine; style tips 0.8-2 mm long ..... ***C. arizonicum*** (Gray) Petrauk (Arizona thistle) PerForb, common in warm desert, pinyon-juniper/oak, montane conifer, & wetlands, Jun-Aug.
6. Corolla pale pink, pink-purple, or rarely white; style tips 2-7 mm long
7. Style tips 2-3 mm long; involucre bracts roughened on surface. .... ***C. calcareum*** (Jones) Woot. & Standl. **var. *pulchellum*** (Greene) Welsh (Pretty thistle) PerForb, Reported by Palmer (1966) for pinyon-juniper, montane conifer, & wetland sites, Jun-Sep.
7. Style tips 3.5-6 mm long; involucre bracts mostly smooth on surface ..... ***C. wheeleri*** (Gray) Petrauk
8. Leaves deeply pinnately lobed ..... **var. *wheeleri*** (Wheeler's thistle) PerForb, uncom in pinyon-juniper/oak & montane conifer forest, Jul-Sep.
8. Leaves entire with wavy and spiny margins, but not deeply lobed ..... **var. *salinense*** Welsh (Salina thistle) PerForb, rare in pinyon-juniper/oak and montane conifer forest, Jul-Sep.

***Conyza*** (Horseweed)

***C. canadensis*** (L.) Cronq. **var. *glabrata*** (Gray) Cronq. (Canadian horseweed) AnnForb, uncom in wet or disturbed areas, Jul-Sep.

***Crepis*** (Hawksbeard)

1. Stems and leaves glabrous or with spreading hairs, but not woolly-tomentose; leaves shallowly toothed but not deeply lobed ..... ***C. runcinata*** (James) Torrey & Gray (Meadow hawksbeard) PerForb; Reported by Ott (2010) often in wetlands; variety not determined, but probably *glauca* or *runcinata*.
1. Stems and leaves mostly woolly tomentose; leaves deeply pinnately lobed and coarse toothed
2. Flower heads narrow, glabrous, with 5-8 main involucre bracts and 5-12 flowers ..... ***C. acuminata*** Nutt. (Mountain hawksbeard) PerForb, Reported by Ott (2010) for montane conifer, May-Jul.
2. Flower heads narrow to broad, usually woolly tomentose or with gland-tipped hairs, with 8 or more main involucre bracts and 7-40 flowers
3. Involucre more than twice as long as wide, lacking gland-tipped black hairs; heads mostly 7-12 flowered ..... ***C. intermedia*** Gray (Gray hawksbeard) PerForb, uncom in sagebrush, pinyon-juniper, and oak, May-Jul.
3. Involucre less than twice as long as wide, with gland-tipped black hairs; heads mostly 10-40 flowered ..... ***C. occidentalis*** Nutt. **var. *occidentalis*** (Western hawksbeard) PerForb, uncom in desert shrub, sagebrush, pinyon-juniper, & montane conifer, May-Jul.

***Encelia*** (Brittlebush)

***E. frutescens*** (Gray) Gray **var. *virginensis*** (A. Nels.) Blake (Virgin encelia) Shrub, Uncom in desert shrub, Apr-Jun (*E. virginensis*).

***Ericameria*** (Rabbitbrush)

Formerly included in *Chrysothamnus* & *Haplopappus*

1. Flower heads solitary on branches; ray flowers present or absent; stems sticky-glutinous or glandular
2. Ray flowers present; involucre 8-10 mm long; heads borne on stalks well above leaves ..... ***E. linearifolia*** (DC.) Urbatsch & Wussow (Mohave goldenbush) Shrub, uncom in warm desert and pinyon-juniper/oak, Apr-May (*Haplopappus linearifolius* var. *interior*, *Stenotus linearifolius*).
2. Ray flowers absent; involucre 13-15 mm long, heads often overtopped by leaves ..... ***E. zionis*** (LC Anderson) Nesom (Cedar Breaks goldenbush) Shrub, Reported by Atwood et al. (1991) on limestone in montane conifer stands or talus, Jul-Aug (*Haplopappus zionis*). Type locality: Cedar Canyon, Iron County, Utah. May occur in Kolob region of Zion NP, or may be falsely reported based on its specific epithet (probably named for the view of northern Zion from the head of Cedar Canyon).
1. Flower heads 2-several per branch; ray flowers absent; stems covered by felt-like tomentum

3. Involucral bracts sharp-tipped; flower heads arranged in a raceme . . . . . **E. parryi** (Gray) Nesom & Baird
  4. Uppermost leaves longer than the inflorescence; corolla lobes 1.8-2.2 mm long . . . . . **var. howardii** (Parry ex Gray) Nesom (Longbract rabbitbrush) Shrub, uncom in mountain conifer and brush and pinyon-juniper, Jul-Sep (*Chrysothamnus parryi* var. *howardii*).
  4. Uppermost leaves shorter than the inflorescence; corolla lobes 1.3-1.7 mm long . . . . . **var. nevadensis** (Gray) Nesom & Baird (Nevada rabbitbrush) Shrub, uncom in mountain conifer and brush & pinyon-juniper, Jul-Sep (*Chrysothamnus parryi* var. *nevadensis*)
3. Involucral bracts blunt-tipped; flower heads arranged in a cyme . . . **E. nauseosa** (Pall. ex Pursh) Nesom & Baird
  5. Achenes and ovaries glabrous
    6. Flowers 5-8 mm long; involucre 7-9 mm long and 1.5-3 mm wide . **var. leiosperma** (Gray) Nesom & Baird (Smoothseed rabbitbrush) Shrub, uncom in sandstone crevices on slickrock, Aug-Oct (*Chrysothamnus nauseosus* var. *leiosperma*).
    6. Flowers 8.3-10 mm long; involucre 9-11 mm long and over 3.5 mm wide . . . . . **var. turbinata** (Jones) Nesom & Baird (Dune rabbitbrush) Shrub, Reported by Welsh (1995); sandy sagebrush & pinyon-juniper, Aug-Oct. (*Chrysothamnus nauseosus* var. *turbinatus*).
  5. Achenes and ovaries pubescent
    7. Involucre over 10 mm long; corolla 9.5-10.5 mm long
      8. Involucre tapering and club-shaped, the bracts strongly keeled and ranked . . . . . **var. arenaria** (L.C. Anderson) Nesom & Baird (Sand rabbitbrush) Shrub, uncom in sandy sagebrush and pinyon-juniper stands, Aug-Oct (*Chrysothamnus nauseosus* var. *arenarius*).
      8. Involucre cylindric, the bracts neither strongly keeled or ranked . . . . . **var. turbinata** (Jones) Blake (see couplet 6)
    7. Involucre 6.5-10 mm long (or if over 10 mm, the leaves deciduous at anthesis); corolla 5-9 mm long
      9. Corolla lobes commonly long-pilose (glabrate with age); leaves often deciduous by flowering time . . . . . **var. juncea** (Greene) Nesom & Baird (Rush rabbitbrush) Shrub, uncom in warm desert, sagebrush, & pinyon-juniper, often on sandstone, Aug-Oct (*Chrysothamnus nauseosus* var. *juncea*).
  9. Corolla lobes glabrous; leaves usually present at flowering time
    10. Corolla lobes 0.4-0.9 mm long; involucre bracts tomentose . . . . . **var. hololeuca** (Gray) Nesom & Baird (Graystem rabbitbrush) Shrub, com in warm desert, sagebrush, oak, & pinyon-juniper Aug-Oct (*Chrysothamnus nauseosus* var. *hololeucus*, *C. nauseosus* var. *gnaphalodes*).
    10. Corolla lobes 1-2 mm long; involucre bracts glabrous to sparsely hairy (white tomentose in var. *speciosa*)
      11. Leaves 3-5 nerved, mostly 1-3 mm wide . . . . . **var. graveolens** (Nutt.) Reveal & Schuyler (Glabrate rabbitbrush) Shrub, uncom in warm desert, sagebrush, pinyon-juniper, montane conifer, & wetland, Aug-Oct (*Chrysothamnus nauseosus* var. *graveolens*).
      11. Leaves 1-nerved, mostly 0.5-1.5 mm wide
        12. Leaves or stems grayish or whitish woolly or green, but not yellow-green; involucre somewhat woolly . . . . . **var. speciosa** (Nutt.) Nesom & Baird (Whitestem rabbitbrush) Shrub, uncom warm desert shrub sites, often associated with Chinle or clay soils. Aug-Oct. (*Chrysothamnus nauseosus* var. *speciosa*).
        12. Leaves or stems usually yellowish-green with resinous-matted woolly hairs; involucre glabrous . . . . . **var. oreophila** (A. Nels.) Nesom & Baird (Greenish rabbitbrush) Shrub, common in warm desert, sagebrush, pinyon juniper, montane conifer and brush, & wetlands, Aug-Oct (*Chrysothamnus nauseosus* var. *consimilis*).

**Erigeron** (Daisy, Fleabane)

1. Stems glabrous (except sometimes below the flower heads), leafy throughout; stem leaves broadly lance-shaped, only gradually becoming smaller higher up the stem . . . . . **E. speciosus** Lindl. ex DC. **var. macranthus** (Nutt.) Cronq. (Aspen daisy) PerForb, Uncom in oak and montane conifer forest, Jun-Aug.
1. Stems with appressed or spreading hairs; stem leaves all narrowly linear and gradually to abruptly smaller higher up the stem
  2. Plants turf-forming; roots fibrous and intertwined; base of stems and lower leaves usually purplish . . . . . **E. ursinus** DC. Eaton in Wats. **var. meyeriae** Welsh (Meyer's daisy) PerForb, rare, Jul-Aug. Type locality from Lava Point, Zion NP.
  2. Plants not turf-forming, stems usually clumped; taprooted or with a woody caudex; base of stems and lower leaves usually green to white hairy

- 3. Stem hairs spreading
  - 4. Leaves 3 nerved . . . . . **E. jonesii** Cronq.  
(Jones' daisy) PerForb, rare in pinyon-juniper/sagebrush & Ponderosa, Jun-Jul.
  - 4. Leaves 1 nerved
    - 5. Plants biennial or short-lived perennial with slender taproots . . . . .  
. . . . . **E. divergens** Torr. & Gray **var. divergens**  
(Spreading daisy) PerForb, common in pinyon-juniper, sagebrush, oak, montane conifer, & wetlands, May-Sep.
    - 5. Plants long-lived perennials with a woody caudex . . . . .  
. . . . . **E. pumilus** Nutt. **var. concinnus** (Hook. & Arnot) Dorn  
(Navajo fleabane) PerForb, uncom in warm desert shrub, sagebrush, pinyon-juniper, & montane conifer; May-Aug.
- 3. Stem hairs appressed and ascending
  - 6. Stems leafy, leaves gradually reduced in size higher up the stem
    - 7. Stems and leaves silvery-white, tall, leaves narrow, unlobed, achenes 4 nerved; involucre bracts in two rows and overlapping like roof shingles . . . . . **E. utahensis** Gray **var. utahensis**  
(Utah daisy) PerForb, uncom in warm desert, sagebrush, and pinyon-juniper/oak, often on sandstone rock, Apr-Jun.
    - 7. Stems green, short, leaves green, lobed or entire, achenes 2 nerved; involucre bracts in one row, not overlapping
      - 8. Ray flowers commonly 40-80; leaves entire or occasionally with a few teeth or lobes . . . . .  
. . . . . **E. religiosus** Cronq.  
(Religious daisy) PerForb, uncom in Navajo Sandstone and sandy soils (often where moist), May-Sep. Type locality from Clear Creek, Zion NP.
      - 8. Ray flowers commonly 25-40; leaves lobed or cleft . . . . . **E. sionis** Cronq.  
(Zion daisy) PerForb, uncom in Navajo sandstone slickrock or wet areas, Apr-Sep. Type locality from Zion NP.
  - 6. Leaves mostly basal, abruptly reduced in size higher up the stem
    - 9. Leaves 3 nerved . . . . . **E. eatonii** Gray  
(Eaton's daisy) PerForb, uncom in pinyon-juniper, sagebrush, & montane conifer, May-Jul.
    - 9. Leaves 1 nerved
      - 10. Stems with elongate, leafy stolons, basal leaves broadly spoon-shaped, to 8 mm wide . . . . .  
. . . . . **E. flagellaris** Gray  
(Trailing daisy) PerForb, uncom in pinyon-juniper and montane forest, May-Aug.
      - 10. Stems lacking stolons, basal leaves linear, 1-3 mm wide . . . . . **E. canaani** Welsh  
(Canaan daisy) PerForb, uncom in Navajo Sandstone slickrock and sandy Ponderosa pine, Apr-Jul.

**Eriophyllum** (Woollyleaf)

**E. wallacei** (Gray) Gray (Wallace's woollyleaf) AnnForb, uncom in warm desert shrub, Apr-Jun (*Antheropeas wallacei*).

**Euthamia** (Goldenrod)

**E. occidentalis** Nutt. (Western goldenrod) PerForb, uncom in wetlands, Jul-Oct (*Solidago occidentalis*).

**Gaillardia** (Blanketflower)

- 1. Disk flowers yellow; leaves mostly entire, or some toothed or lobed, mostly all basal . . . . . **G. parryi** Greene  
(Parry's blanketflower) PerForb, Historic, on Carmel, Chinle or Moenkopi soils in pinyon-juniper, May-Sep.
- 1. Disk flowers purple; leaves all pinnately lobed; stems leafy
  - 2. Ray flowers yellow throughout, corolla lobes 2-5 mm long; base of involucre bracts not especially hairy . . . . .  
. . . . . **G. pinnatifida** Torr.  
(Hopi blanketflower) PerForb, uncom in warm desert, sagebrush, or pinyon-juniper/ oak, Apr-Aug.
  - 2. Ray flowers purple or brown-purple throughout, or yellow only at the tip, corolla lobes 3-7 mm long; base of involucre bracts long-hairy . . . . . **G. pulchella** Foug.  
(Firewheel) AnnForb, rare, introduced in roadside plantings (native to southern USA), May-Jun.

**Glyptopleura** (Crustweed)

**G. setulosa** Gray (Setose crustweed) AnnForb, Historic; in warm desert shrub, Apr-May.

**Gnaphalium** (Cudweed)

**G. palustre** Nutt. (Lowland cudweed) AnnForb, rare in sagebrush, pinyon-juniper, montane conifer, & wetlands, May-Oct.

**Grindelia** (Gumweed)

**G. squarrosa** (Pursh) Dunal **var. serrulata** (Rydb.) Steyererm. (Curly-cup gumweed) PerForb, uncom in warm desert shrub, sagebrush, wetland, and disturbed areas, Jul-Sep.

**Gutierrezia** (Snakeweed)

1. Heads cylindric; each head with 1-2 ray and disk flowers . . . . . **G. microcephala** (DC.) Gray (Thread snakeweed) Shrub, uncom in warm desert shrub and pinyon-juniper/oak, Jul-Oct.
1. Heads top-shaped; each head with 3-7 or more ray flowers and 3-7 disk flowers . . . . . **G. sarothrae** (Pursh) Britt. & Rusby (Broom snakeweed) Shrub, common in warm desert shrub pinyon-juniper, and oak, Jul-Oct.

**Helianthella** (Little sunflower)

1. Flower heads with a purple disk; ray flowers less than 1.5 cm long . . . . . **H. microcephala** (Gray) Gray (Purple-disk sunflower) PerForb, rare, rock outcrops in pinyon-juniper & montane conifer, Jul-Sep.
1. Flower heads with a yellow disk; ray flowers over 2 cm long
  2. Flower heads usually nodding or turned to one side; involucre bracts lance-shaped to oval . . . . . **H. quinquenervis** (Hook.) Gray (Fivenerve sunflower) PerForb, uncom in pinyon-juniper/oak & montane forests, Jun-Aug.
  2. Flower heads erect; involucre bracts linear-oblong . . . . . **H. uniflora** (Nutt.) Torr. & Gray (Little sunflower) PerForb, uncom in pinyon-juniper & montane conifer, Jun-Aug.

**Helianthus** (Sunflower)

1. Plants perennial with rhizome-like roots
  2. Leaves bluish-green, often with wavy margins; floral disk red . . . . . **H. ciliaris** DC. (Blue-weed sunflower) PerForb, rare in disturbed areas, Jun-Aug.
  2. Leaves green, entire to slightly toothed, margins not wavy; floral disk yellow . . . . . **H. nuttallii** Torr. & Gray (Nuttall's sunflower) PerForb, rare in wetland areas, Jul-Sep.
1. Plants annual with taproots
  3. Involucre bracts ovate and abruptly tapering to a slender, elongate tip; leaf blades mostly 1-2 times longer than wide, lower leaves often heart-shaped at base . . . . . **H. annuus** L. **ssp. lenticularis** (Dougl. ex Lindl.) Steyererm. (Common sunflower) AnnForb, uncom in disturbed areas, Jun-Sep.
  3. Involucre bracts linear to elliptic, not abruptly tapering to a slender, elongate tip; leaf blades mostly over 3 times longer than wide, lower leaves truncate to tapered at base but not heart-shaped
    4. Receptacle bracts at center of flower head white-bearded at tip; involucre bracts short-hairy, lacking stiff ciliate hairs on margin; achenes with 2 awn-scales . . . . . **H. petiolaris** Nutt. **var. fallax** (Heiser) Welsh (Prairie sunflower) AnnForb, Uncom in warm desert, sagebrush, pinyon-juniper, and disturbed areas, Jun-Sep.
    4. Receptacle bracts at center of flower head without a white-bearded tip; involucre bracts with stiff, hispid or ciliate hairs on face and margins; achenes often with pappus of several short awns and teeth . . . . . **H. anomalus** Blake (Sand sunflower) AnnForb, Reported by Ott (2010), sandy areas, May-Sep.

**Heliomeris** (Goldeneye)

1. Plants perennial; ray flowers usually more than 10 . . . . . **H. multiflora** Nutt.
  2. Leaves broadly elliptic to lance-shaped, 8-25 mm wide and 3-8 times longer than wide . . . . . **var. multiflora** (Showy goldeneye) PerForb, common in pinyon-juniper/oak, sagebrush, montane conifer, & wetlands, Jun-Sep (*Viguiera multiflora* var. *multiflora*).
  2. Leaves narrowly linear, 2-8 mm wide and 7-20 times longer than wide . . . . . **var. nevadensis** (A. Nels.) Yates (Showy goldeneye) PerForb, common in warm desert, pinyon-juniper, & sagebrush, Jun-Sep, (*Viguiera multiflora* var. *nevadensis*).
1. Plants annual; ray flowers usually 8 . . . . . **H. longifolia** (Robins. & Greenm.) Cockerell **var. annua** (Jones) Yates (Southern goldeneye) AnnForb, uncom in Chinle soils in warm desert, Jun-Oct. (*Viguiera longifolia* var. *annua*, *H. annua*).

**Herrickia** (Aster)

Formerly included in *Aster*; includes *Eucephalus* & *Eurybia*

1. Peduncle or involucre glandular pubescent . . . . . **H. glauca** (Nutt.) Brouillet **var. pulchra** (Blake) Brouillet (Modest aster) PerForb, common in desert shrub, pinyon-juniper, and wetlands, Jul-Oct (*Aster wasatchensis* var. *pulchra*, *Eucephalus pulcher*, *Eurybia pulchra*).

1. Peduncle and involucre not glandular pubescent . . . . . ***H. glauca*** (Nutt.) Brouillet **var. *glauca*** (Blueleaf aster) PerForb, uncom in pinyon-juniper, montane conifer, and wetlands, Jul-Sep (*Aster glaucodes*, *Eucephalus glaucus*, *Eurybia glauca*).

***Heterotheca*** (Golden-aster)

1. Plants low, creeping, arising from rhizome-like caudex branches; heads solitary or 2-3 . . . . . ***H. jonesii*** (Blake) Welsh & Atwood (Jones' golden-aster) PerForb, uncom in Navajo sandstone crevices in montane conifer forest & shrub, May-Sep (*Chrysopsis jonesii*). Type locality is Springdale.
1. Plants erect and forming rounded clumps from an erect caudex without rhizome-like branches; heads usually more than 3
  2. Heads borne in corymb-like clusters; peduncles, stems, and leaves densely pubescent, appearing white or gray-green . . . . . ***H. zionensis*** Semple (Zion golden-aster) PerForb, rare, sandy soils in pinyon-juniper, sagebrush, & montane conifer, May-Sep (*Chrysopsis zionensis*).
  2. Heads borne in loose to compact corymb-like clusters or not at all corymb-like; stems and leaves seldom densely pubescent, appearing green or silvery-gray
  3. Heads nearly sessile, closely subtended by ovate to lance-shaped leaf-like bracts . . . . . ***H. fulcrata*** (Greene) Shinnars (Rocky scree golden-aster) PerForb, uncom, west of Dakota Hill, burned grasslands (*Chrysopsis fulcrata*, included in *C. villosa* by some authorities) Jun-Aug.
  3. Heads on peduncles that well exceed the narrow, uppermost bracts . . . . . ***H. villosa*** (Pursh) Shinnars
    4. Leaves green, the surface readily apparent through the spreading hairs . . . . . **var. *minor*** (Hook.) Semple (Hispid golden-aster) PerForb, common in warm desert, sagebrush, pinyon-juniper/oak, & montane conifer, May-Sep (*Chrysopsis villosa* var. *minor*, *H. villosa* var. *hispidata*).
    4. Leaves silvery or grayish, the surface mostly covered by appressed hairs . . . . . **var. *villosa*** (Hairy golden-aster) PerForb, uncom in pinyon-juniper & montane conifer, May-Sep (*Chrysopsis villosa* var. *villosa*).

***Hieracium*** (Hawkweed)

***H. fendleri*** Schulz-Bip (Fendler's hawkweed) PerForb; uncom, Ponderosa pine forest on Wildcat Trail, Jun-Jul.

***Hymenopappus*** (Hyalineherb)

***H. filifolius*** Hook.

1. Basal leaf axils prominently white-tomentose; stems leaves often more than 2 . . . . . **var. *cinereus*** (Rydb.) I.M. Johnst. (Common hyalineherb) PerForb, common in warm desert, sagebrush, pinyon-juniper/oak, & montane conifer, May-Oct.
1. Basal leaf axils sparingly tomentose or glabrous; stems scapose, or with 1 or 2 leaves . . . . . **var. *nudipes*** (Maguire) Turner (Alpine hyalineherb) PerForb, uncom in sagebrush, pinyon-juniper, & montane conifer, May-Oct. Type locality is 15 miles N of Orderville, Kane Co.

***Hymenoxys*** (Hymenoxys)

***H. cooperi*** (Gray) Cockerell (Cooper's hymenoxys) PerForb, uncom in warm desert, sagebrush, & pinyon-juniper, May-Jul.

***Isocoma*** (Jimmyweed or Goldenweed)

***I. humilis*** Nesom (Canyon goldenweed) PerForb, extirpated? (last observed in 1971), from rock crevices, Sep. Type locality is Zion NP (*Haplopappus leverichii*, *I. leverichii*).

***Iva*** (Poverty-weed)

***I. axillaris*** Pursh (Poverty-weed) PerForb, uncom in warm desert, pinyon-juniper, montane conifer, wetland, & disturbed sites, May-Sep.

***Lactuca*** (Lettuce)

***L. serriola*** L. (Prickly lettuce) AnnForb, introduced (native to Europe), common in disturbed areas, especially after fire, Jul-Sep.

***Layia*** (Tidytips)

***L. glandulosa*** (Hook.) Hook. & Arnot (Tidytips) AnnForb, uncom in sandy areas and warm desert scrub, Apr-Jul.



**Logfia** (Fluffweed)

**L. flaginoides** (Hook. & Arn.) Morefield (Fluffweed) AnnForb, uncom in warm desert shrub, Apr-May (*Filago californica*, *L. californica*). Note that *Logfia* is an anagram of *Filago*.

**Lygodesmia** (Rushpink)

**L. grandiflora** (Nutt.) Torr. & Gray **var. dianthopsis** (D.C. Eat.) Welsh (Western rush-pink) PerForb, uncom in warm desert, sagebrush, oak, & montane conifer, May-Jun. (*L. dianthopsis*).

**Machaeranthera** (Hoary aster)

1. Leaves pinnately dissected; plants annual ..... **M. tanacetifolia** (H.B.K.) Nees (Tansyleaf aster) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, May-Sep.
1. Leaves entire to merely toothed; plants biennial ..... **M. canescens** (Pursh) Gray
2. Stems with stalked glands from above the middle; leaf surfaces glabrous (sometimes glandular) ..... **var. aristata** (Eastw.) Turner (Aristate aster) PerForb, uncom in warm desert, sagebrush, pinyon-juniper/oak, & montane conifer, Jul-Oct (*Dieteria canescens* var. *aristata*).
2. Stems without stalked glands above the middle or glandular only below the flower heads; leaf surfaces pubescent
3. Leaves of upper branches small and bract-like ..... **var. leucanthemifolia** (Greene) Welsh (Thickleaf aster) PerForb, uncom in warm desert, sagebrush, pinyon-juniper/oak, & montane conifer, May-Sep (*Dieteria canescens* var. *leucanthemifolia*).
3. Leaves of upper branches not small and bract-like ..... **var. canescens** (Hoary aster) PerForb, uncom in sagebrush and pinyon-juniper, Jul-Oct (*Dieteria canescens* var. *canescens*).

**Madia** (Tarweed)

**M. glomerata** Hook. (Mountain tarweed) AnnForb, uncom in sagebrush, pinyon-juniper, & montane conifer, Jul-Sep.

**Malacothrix** (Malacothrix)

**M. stebbinsii** Davis & Raven (Stebbins' desert-dandelion) AnnForb, uncom in warm desert, pinyon-juniper & sagebrush, Apr-May (*M. clevelandii* var. *stebbinsii*).

**Microseris** (Microseris)

**M. lindleyi** (DC.) Gray (Lindley's microseris) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Mar-Jun (*Uropappus lindleyi*).

**Mulgedium** (Blue lettuce)

**M. pulchellum** (Pursh) G. Don in Sweet (Blue lettuce) PerForb, uncom in wetlands, Jun-Sep (*Lactuca pulchella*, *L. tatarica* var. *pulchella*, *L. oblongifolia*, *Mulgedium oblongifolium*).

**Onopordum** (Scotch thistle)

**O. acanthium** L. (Scotch thistle) PerForb, introduced (native to Eurasia), Utah state noxious weed, uncom in disturbed areas, Jun-Sep

**Packera** (Butterweed, Groundsel)

Formerly included in *Senecio*

1. Basal leaves deeply pinnately lobed (nearly to the midrib); plants taprooted ..... **P. multilobata** (Torr. & Gray) Weber & Löve (Basin groundsel) PerForb, common in warm desert shrub, sagebrush, pinyon-juniper/oak, & montane conifer woods, Apr-Aug (*Senecio multilobatus*).
1. Basal leaves finely to irregularly toothed but not lobed to midrib; plants with a deep rhizome ..... **P. streptanthifolia** (Greene) Weber & Löve **var. streptanthifolia** (Rocky Mountain groundsel) PerForb, uncom in pinyon-juniper, sagebrush, & montane conifer, Jun-Aug (*Senecio streptanthifolius* var. *streptanthifolius*).

**Pectis** (Cinch-weed)

**P. papposa** Harvey & Gray (Cinch-weed) AnnForb, rare in sandy soils, Aug-Oct.

**Perityle** (Rock-daisy)

**P. tenella** (Jones) Macbride (Dixie rock-daisy) PerForb, common in sandstone crevices, Apr-Aug. Type locality is Springdale.

**Petradoria** (Rock goldenrod)

**P. pumila** (Nutt.) Greene **var. pumila** (Rock goldenrod) PerForb, uncom in warm desert, sagebrush, pinyon-juniper/oak, & montane conifer, Jul-Sep (*Solidago petradoria*).

**Pluchea** (Arrowweed)

**P. sericea** (Nutt.) Cov. (Arrowweed) Shrub, uncom in wetlands, May-Jun (*Tessaria sericea*).

**Psathyrotes** (Turtleback)

**P. pilifera** Gray (Piliferous turtleback) AnnForb, uncom in warm desert shrub on clayey soils, Aug-Oct.

**Pseudognaphalium** (Cudweed)

**P. canescens** (DC.) Anderb. (Wright's cudweed) PerForb, uncom in rocky sandstone crevices, Aug-Oct (*G. canescens*, *G. wrightii*).

**Rafinesquia** (Desert chicory)

**R. neomexicana** Gray (Desert chicory) AnnForb, Historic in warm desert shrub, Apr-May.

**Ratibida** (Mexican Hat)

**R. columnifera** (Nutt.) Woot. & Standl. (Prairie coneflower) PerForb, rare in warm desert, sagebrush, & pinyon-juniper, Jun-Aug.

**Rudbeckia** (Coneflower)

1. Leaves toothed to entire, not palmately or pinnately divided . . . . . **R. occidentalis** Nutt. (Western coneflower) PerForb, rare in pinyon-juniper & montane conifer, Jun-Aug.
1. Leaves lobed or deeply divided into 3-7 segments . . . . . **R. montana** Gray (Montane coneflower) PerForb, uncom in montane conifer, Jun-Sep.

**Senecio** (Groundsel or Butterweed)

1. Leaves all about the same size or uppermost leaves only slightly smaller than lower leaves; basal rosette absent
  2. Plants annual; heads only with disk flowers . . . . . **S. vulgaris** L. (Common groundsel) AnnForb, introduced from Europe, uncom in disturbed areas, May-Oct.
  2. Plants perennial; heads with ray and disk flowers
    3. Leaves broadly oblanceolate, margins coarsely toothed and pinnately lobed, often nearly halfway to midrib . . . . . **S. eremophilus** Rich. **var. kingii** (Rydb.) Greenm. (Cut-leaved groundsel) PerForb, uncom in montane conifer woods, Jul-Sep.
    3. Leaves entire and linear or pinnately compound with narrow, linear lobes
      4. Leaves and stems persistently woolly-tomentose; involucre broadly bell-shaped, with 13-21 bracts; flower heads with 8-13 rays . . . . . **S. douglasii** DC. **var. longilobus** (Benth.) Benson (Douglas' groundsel) PerForb, uncom in warm desert, sagebrush, & pinyon-juniper/oak, May-Oct (*S. flaccidus* var. *flaccidus*, *S. flaccidus* var. *douglasii*).
      4. Leaves and stems glabrous or occasionally with sparse, short pubescence; involucre narrowly bell-shaped, with 8-13 bracts; flower heads with 5-8 rays . . . . . **S. spartioides** Torr. & Gray **var. spartioides** (Broom groundsel) PerForb, uncom in sandy sites from warm desert zone through pinyon-juniper to montane conifer, Jun-Oct.
  1. Lower stem leaves much larger than upper leaves; basal rosette present
    5. Basal leaves deeply pinnately lobed (nearly to the midrib); stem leaves smaller, but also deeply lobed to midrib; plants taprooted . . . . . see **Packera multilobata**
    5. Basal leaves finely to irregularly toothed or nearly entire, not lobed (or if lobed, not nearly to the midrib); stem leaves smaller, finely to deeply lobed, but obviously narrower than basal leaves; plants with a deep rhizome or button-like rootcrown
      6. Ray flowers lacking, or minute; basal leaves nearly entire or finely toothed; stems glaucous, glabrous, somewhat succulent, and hollow . . . . . **S. hydrophilus** Nutt. (Water groundsel) PerForb Reported (Ott 2010); wetlands, Jul-Aug.
      6. Ray flowers present, showy; basal leaves finely toothed to shallowly lobed; stems usually woolly hairy (at least in leaf axils), neither glaucous, succulent, nor hollow
        7. Stem leaves toothed but not deeply lobed; stems and leaves with woolly hairs (most obvious when plants are young, but persistent in leaf axils at full maturity), hairs with internal cross-walls (when viewed under 10x magnification) . . . . . **S. integerrimus** Nutt. **var. exaltatus** (Nutt.) Cronq. (Western groundsel) PerForb, uncom in pinyon-juniper, sagebrush, & montane conifer, Jun-Aug.
        7. Stem leaves deeply lobed; stems and leaves glabrous or lightly woolly-pubescent only when young, hairs without internal cross-walls . . . . . see **Packera streptanthifolia**

**Solidago** (Goldenrod)

1. Largest leaves at base of stem, stem leaves much smaller and entire or finely toothed . . . . . **S. nana** Nutt.  
(Baby goldenrod) PerForb, rare in wetlands and montane conifer, Aug-Sep.
1. Largest leaves at middle of stem, basal leaves lacking or withered, stem leaves coarsely toothed
  2. Leaves only slightly reduced upwards; stems glabrous at the base . . . . . **S. canadensis** L. var. **salebrosa** (Piper) Jones  
(Canadian goldenrod) PerForb, uncom in wetlands, Aug-Oct (*S. lepida*).
  2. Leaves conspicuously reduced upwards; stems pubescent throughout . . . . . **S. velutina** DC.  
(Three-nerve goldenrod) PerForb, common in sagebrush, pinyon-juniper, montane conifer, & wetlands, Aug-Oct (*S. sparsiflora*).

**Sonchus** (Sow-thistle)

1. Plants perennial with deep, rhizome-like roots; flower heads 3-5 cm wide, involucre more than 14 mm long in . . . . . **S. arvensis** L.  
(Field sow-thistle) AnnForb, introduced (native to Europe), Reported (Fowler et al. (2007), disturbed areas, Jul-Oct.
1. Plants annual from a taproot; flower heads less than 2.5 cm wide; involucre less than 14 mm long in fruit
  2. Achenes nerved but lacking transverse wrinkles between the nerves; leaves finely and sharply toothed, auriculate auriculate bases often rounded . . . . . **S. asper** (L.) Hill  
(Spiny-leaf sow-thistle) AnnForb, introduced from Europe, com in wetlands & disturbed areas, Jul-Oct.
  2. Achenes nerved and with transverse wrinkles between the nerves; leaves coarsely toothed, auriculate bases often pointed . . . . . **S. oleraceus** L.  
(Common sow-thistle) AnnForb, introduced from Europe, uncom in disturbed areas, Jul-Oct.

**Sphaeromeria** (Chicken sage)

**S. ruthiae** Holmgren, Schultz & Lowrey (Ruth's sphaeromeria) Shrub, uncom in crevices of Kayenta or Navajo sandstone, Aug-Sep. Type locality is Refrigerator Canyon, Zion NP (*Artemisia ruthiae*).

**Stenotus** (Matted goldenweed)

**S. armerioides** Nutt. (Thrift goldenweed) PerForb, uncom on Carmel limestone talus & pinyon-juniper/oak; May-Jul. (*Haplopappus armerioides*).

**Stephanomeria** (Wirelettuce)

1. Plants annual with slender taproots; pappus bristles white, feathery on upper 2/3, smooth at base . . . . . **S. exigua** Nutt.  
(White-plume wire-lettuce) AnnForb, uncom, warm desert, sagebrush, & pinyon-juniper, May-Sep.
1. Plants perennial, usually from a caudex; pappus bristles white or brownish, feathery throughout or only on upper 2/3
  2. Leaves entire or dentate, filiform to linear; pappus bristles white (rarely brownish) and feathery throughout . . . . . **S. tenuifolia** (Torr.) Hall var. **tenuifolia**  
(Slender wire-lettuce) PerForb, Common in rock outcrops from warm desert to montane conifer zones and wetlands, Jun-Sep (*S. minor* var. *minor*).
  2. Leaves pinnatifid or lobed, linear-subulate; pappus bristles brownish and feathery only over upper 2/3 . . . . . **S. pauciflora** (Torr.) A. Nels.  
(Brown-plume wire-lettuce) PerForb, uncom, sandy soils in warm desert & pinyon-juniper, May-Oct.

**Symphotrichum** (Aster)

Formerly in *Aster*; see also *Herrickia*

1. Involucre bracts with short spine tip; leaves narrow, usually less than 5 mm wide; rays white . . . . . **S. falcatum** (Lindl.) Nesom  
(Falcate aster) PerForb, uncom in sagebrush, pinyon-juniper, & montane conifer, Aug-Sep (*Aster falcatus*).
1. Involucre bracts pointed but not spine-tipped; leaves often over 5 mm wide; rays white, pink, lavender, blue, or purple
  2. Outer involucre bracts blunt-tipped, white at base, and much shorter than the inner, sharp-tipped, green bracts; frequently in dry habitats . . . . . **S. ascendens** (Lindl.) Nesom  
(Pacific aster) PerForb, uncom in sagebrush, pinyon-juniper/oak, montane conifer, occasionally in wetlands, Jul-Oct (*Aster ascendens*).
  2. Outer involucre bracts pointed, green throughout, and equal to or slightly shorter than the inner bracts; found in moist habitats

3. Lower leaves petioled, middle to upper leaves sessile but not clasping; rhizomes usually long, not producing new shoots close to the stem; ray flowers blue or purple . . . . . **S. spathulatum** (Lindl.) Nesom (Western aster) PerForb, Reported by Ott (2010), wetlands, Aug-Oct. (*A. occidentalis*, *A. spathulatus*).
3. Leaves all sessile and clasping; rhizomes short, producing off-shoots close to the stem in late summer or fall; ray flowers white or pink when fresh (may dry to purple) . . . . . **S. welshii** (Cronq.) Nesom (Welsh's aster) PerForb, locally common in wetlands and hanging gardens, Aug-Oct (*Aster welshii*). Type locality is Zion Canyon.

**Taraxacum** (Dandelion)

1. Achenes straw-colored or greenish-brown at maturity; leaf margins moderately divided below middle, terminal (uppermost) portion undivided . . . . . **T. officinale** Weber ex Wigg. (Common dandelion) PerForb, introduced (native to Eurasia), uncom in sagebrush, pinyon-juniper/oak, montane conifer, wetlands, & disturbed areas, Apr-Dec.
1. Achenes reddish-brown at maturity; leaf margins deeply divided throughout, including the terminal portion . . . . . **T. laevigatum** (Willd.) DC. (Red-seed dandelion) PerForb, introduced (native to Eurasia), rare in sandstone canyons near east entrance; Apr-Oct.

**Tetradymia** (Horsebrush)

1. Stems with spreading spine-like leaves, these subtending a whorl of green, nearly glabrous leaves 2-12 mm long; flower heads occur singly or in groups of 2-3 in axils of leaves . . . . . **T. axillaris** A. Nels. (Longspine horsebrush) Shrub, uncom in warm desert shrub, Apr-Jun (*T. spinosa* var. *longispina*).
1. Stems lacking spines, leaves 5-40 mm long, grayish woolly, and alternate or whorled; flower heads occur in groups of 3-several in a terminal corymb . . . . . **T. canescens** DC. (Spineless horsebrush) Shrub, uncom in pinyon-juniper, sagebrush, & montane conifer/brush, Jun-Sep.

**Tetraneuris** (Hymenoxys)

- T. acaulis** (Pursh) Greene var. **arizonica** (Greene) Parker (Arizona hymenoxys) PerForb, uncom in warm desert, sagebrush, pinyon-juniper/oak, & montane conifer, Apr-Jun (*Hymenoxys acaulis* var. *arizonica*).

**Thelesperma** (Greenthread)

- T. megapotamicum** (Spreng.) Kuntze (Hopi-tea) PerForb, rare in warm desert, pinyon-juniper or montane conifer, Jun-Aug.

**Thymophylla** (Glandweed)

- T. pentachaeta** (DC.) Small var. **belenidium** (DC.) Strother (Scale glandweed) PerForb, rare in desert shrub on rocky soils, May-Oct (*Dyssodia pentachaeta* var. *belenidium*).

**Townsendia** (Easter-daisy)

- T. incana** Nutt. (Hoary Easter-daisy) PerForb, uncom in warm desert, & pinyon-juniper/oak, Apr-Jul.

**Tragopogon** (Salsify)

1. Flowers lemon yellow when fresh, may dry purplish; heads typically have 13 involucre bracts . . . . **T. dubius** Scop. (Yellow salsify) PerForb, introduced from Europe, uncom in disturbed areas, May-Jul.
1. Flowers purple when fresh and dried; heads typically have 8 involucre bracts . . . . . **T. porrifolius** L. (Salsify) PerForb, introduced from Europe, rare in disturbed areas, Apr-Aug.

**Wyethia** (Mules-ears)

- W. arizonica** Gray (Arizona mules-ears) PerForb, uncom in pinyon-juniper, oak, & montane conifer, Jun-Aug.

**Xanthisma** (Goldenweed)

1. Plants annual; outer involucre bracts with a dark (often purplish) spot below the tip . . . . . **X. gracile** (Nutt.) Morgan & Hartman (Slender goldenweed) AnnForb, uncom overall, though locally abundant in recently burned areas, May-Oct (*Machaeranthera gracilis*, *Haplopappus gracilis*).
1. Plants perennial; outer involucre bracts green below the tip . . . . . **X. spinulosum** (Pursh) Morg. & Hartm. var. **gooddingii** (A. Nels.) Morg. & Hartm. (Spiny goldenweed) PerForb (*Haplopappus spinulosus* var. *gooddingii*, *Machaeranthera pinnatifida* var. *gooddingii*, *M. spinulosa* var. *gooddingii*); visitor center planters, Apr-Jun.

**Xanthium** (Cocklebur)

**X. strumarium** L. var. **canadense** (Miller) Torr. & Gray (Rough cocklebur) AnnForb, uncom in sagebrush, pinyon-juniper, & montane conifer, Apr-Oct.

**Berberidaceae** (Barberry Family)

**Mahonia** (Oregon grape, Mahonia)

- 1. Erect shrubs over 6 dm tall or more; leaflets with 5-7 broadly triangular lobes or teeth ..... **M. fremontii** (Torr.) Fedde (Fremont's mahonia) Shrub, Reported for Zion NP by Welsh (1995) and from vicinity of large tunnel on east entrance road, but not confirmed. (*Berberis fremontii*).
- 1. Sprawling to low-growing shrubs 0.5-3 dm tall; leaflets with 12-40 teeth ..... **M. repens** (Lindl.) G. Don (Oregon-grape) Shrub, uncom (*Berberis repens*).

**Betulaceae** (Birch Family)

**Betula** (Birch)

**B. occidentalis** Hook. (Water birch) Tree, uncom in wetland areas. Apr-May.

**Bignoniaceae** (Catalpa Family)

**Catalpa** (Catalpa)

**C. speciosa** Warder (Showy catalpa) Tree, uncom, introduced from eastern North America. Cultivated. May-Jun.

**Boraginaceae** (Borage Family)

Includes Hydrophyllaceae

- 1. Plants woody shrubs; leaves leathery and evergreen, sticky-glutinous and shiny on upper surface, densely white-tomentose on lower surface ..... **Eriodictyon**
- 1. Plants annual or perennial forbs or subshrubs, leaves variously pubescent or glandular but not leathery, evergreen or shiny on upper surface and not white-tomentose on lower surface
  - 2. Leaves pinnately divided or deeply lobed and toothed (sometimes simple in *Phacelia heterophylla*)
    - 3. Inflorescence a ball-like head; leaves pinnately divided, with spreading hairs but not glandular, perennial ..... **Hydrophyllum**
    - 3. Inflorescence a coiled cyme or raceme, but not ball-like; leaves entire, shallowly toothed, or pinnately divided, hairy or glandular; annuals, biennials or short-lived perennials
      - 4. Leaves deeply once-pinnatifid; flowers 2-4 mm long, in a short raceme; seeds reticulate and incurved, resembling a coiled sowbug; plants annual ..... **Eucrypta**
      - 4. Leaves simple with entire or shallowly lobed to toothed margins or deeply once, twice, or thrice pinnatifid; flowers 2-12 mm long, in coiled cymes or racemes; seeds excavated on the lower surface or with reticulate or pitted surfaces, oval, terete, or wedge-shaped but not incurved-coiled ..... **Phacelia**
  - 2. Leaves simple, margins entire
    - 5. Flowers borne singly on elongate, leafless stalks, corolla lobes separate nearly to the base, corolla shallowly dish-shaped, not tubular; leaves all basal ..... **Hesperochiron**
    - 5. Flowers 2 to several on each leafy flowering stem, corolla lobes shallow, joined well above the base, corolla tubular or cup-shaped; leaves along the stem and basal
      - 6. Corolla cup-shaped, white to creamy with a prominent purple ring inside the throat; calyx lobes unequal, the three largest ones heart-shaped at the base and enlarged to enclose the fruiting capsule, the two smaller lobes narrow and short ..... **Tricardia**
      - 6. Corolla tubular, white, orange, yellow, or blue, without a prominent purple ring inside the throat; calyx lobes equal, or if unequal (as in some *Amsinckia*), none of the lobes enlarged and heart-shaped
        - 7. Plants annual
          - 8. Flowers yellow or orange, inflorescence elongate at maturity and strongly coiled ..... **Amsinckia**
          - 8. Flowers white or blue
            - 9. Flowers blue; nutlets with hooked or barbed prickles on margins ..... **Lappula**
            - 9. Flowers white; nutlets glabrous, roughened with tiny bumps or ridges, or hairy

- 10. Corolla limb circular or pentagonal, 8-12 mm wide, resembling a morning-glory, evidently hairy on main veins below and on corolla tube; ovary only shallowly four-lobed, nutlets silky-hairy . . . . . ***Heliotropium***
- 10. Corolla limb distinctly 5-lobed, less than 3 mm wide, lobes erect to spreading and not resembling a morning-glory, glabrous; ovary deeply 4-parted, nutlets glabrous, roughened with tiny bumps or ridges, or hairy with hairs that are coiled at the tip
  - 11. Nutlets round, widely spreading at maturity, covered with hairs that are coiled at the tip . . . . . ***Pectocarya***
  - 11. Nutlets narrowly to broadly elliptic or cross-shaped, erect at maturity, glabrous or with a roughened texture of tiny bumps or ridges but not hairy
    - 12. Nutlets narrowly to broadly elliptic, widest at the base; nutlet scar (the point of attachment of the 1-4 nutlets) a long groove, running most of the length of the nutlet on the ventral surface . . . . . ***Cryptantha***
    - 12. Nutlets cross-shaped, nutlet scar round and near middle of the nutlet . . . . . ***Plagiobothrys***
- 7. Plants perennial
  - 13. Flowers blue or white with blue highlights
    - 14. Corolla tube much longer than the calyx, corolla lobes erect, tubular; nutlets roughened but lacking marginal prickles . . . . . ***Mertensia***
    - 14. Corolla tube equal to calyx, corolla lobes spreading, cup-like; nutlets with prominent marginal prickles . . . . . ***Hackelia***
  - 13. Flowers white or yellow
    - 15. Flowers yellow or greenish yellow; nutlets smooth or sometimes with minute pits, not roughened or with raised ridges or bumps, scar located at the very base . . . . . ***Lithospermum***
    - 15. Flowers white or yellow; nutlets smooth to roughened with raised ridges or minute bumps, nutlet scar runs the length of the nutlet on the ventral side . . . . . ***Cryptantha***

***Amsinckia*** (Fiddleneck)

- 1. Sepals 5, separate except at the base; corolla tube 10-veined below . . . . . ***A. intermedia*** Fisch. & Mey. (Tarweed fiddleneck) AnnForb, uncom in warm desert, Apr-May.
- 1. Sepals 3-4, some fused irregularly fused together; corolla tube 20-veined below . . . . . ***A. tessellata*** Gray (Rough fiddleneck) AnnForb, uncom in desert, sagebrush, & pinyon-juniper, Apr-Jun.

***Cryptantha*** (Cryptanth, Miner's candle, Cats'-eye)

- 1. Plants biennial or perennial; stems usually with a basal cluster of leaves
  - 2. Corolla tube elongate, distinctly surpassing the calyx
    - 3. Corolla yellow; nutlets smooth, shiny . . . . . ***C. confertiflora*** (Greene) Payson (Basin yellow cryptanth) PerForb, common on sandstone rock outcrops in warm desert, pinyon-juniper, & montane conifer, Apr-Jun.
    - 3. Corolla white; nutlets roughened on back with irregular raised ridges and bumps . . . . . ***C. flavoculata*** (A. Nels.) Payson (Yellow-eye cryptanth) PerForb, uncom in pinyon-juniper, sagebrush, oak, & montane conifer, Apr-Jun (*Oreocarya flavoculata*).
  - 2. Corolla tube short, scarcely if at all surpassing the calyx
    - 4. Nutlets smooth on back, inflorescence often short, and ball-like . . . . . ***C. cinerea*** (Torr.) Cronq. **var. arenicola** Higgins & Welsh (Sand cryptanth) PerForb, uncom on sandy soils in sagebrush, pinyon-juniper, & montane conifer, May-Jun. Type locality from Johnson Canyon, Kane County, UT.
    - 4. Nutlets roughened on back with irregular raised ridges and bumps; inflorescences usually elongate or branched, not ball-like
      - 5. Plants multi-stemmed, mat-forming perennials; inflorescence remaining compact in age . . . . . ***C. humilis*** (Greene) Payson (Dwarf cryptanth) PerForb, uncom on Carmel limestone along East Rim Trail in pinyon-juniper, Apr-Jun (*Oreocarya humilis*).
      - 5. Plants 1-few stemmed, erect (not mat-forming) biennials; inflorescence compact early in season, branches widely spreading and having a bushy appearance in age . . . . . ***C. virginensis*** (Jones) Payson (Virgin River cryptanth) PerForb, uncom in warm desert, pinyon-juniper, and oak, Apr-Jun. Type locality is La Verkin.
- 1. Plants annual; stems often without a basal cluster of leaves
  - 6. Nutlet margins winged and coarsely toothed . . . . . ***C. pterocarya*** (Torr.) Greene
  - 7. Nutlets of two types, three winged and one wingless (often hidden among the wings of other nutlets) . . . . . **var. pterocarya**

- 7. Nutlets all alike and all winged . . . . . **var. cycloptera** (Greene) Macbr.  
(Wing-nut cryptanth) AnnForb, uncom in warm desert & pinyon-juniper, Apr-Jul.
- 6. Nutlet margins rounded or angled, but not winged or coarsely toothed
- 8. Stems wider than tall; flowers arranged in small, rounded heads rather than an elongated inflorescence; roots producing a red dye (on hands or pressing paper)
- 9. Calyx 2-3 mm long, upper portion herbaceous and deciduous at maturity (circumscissile), lower portion persistent, cup-like, and white-membranous; plants forming low cushions usually less than 6 cm tall . . . . .  
. . . . . **C. circumcissa** (H. & A.) Johnston  
(Cushion cryptanth) AnnForb, uncom on sandy soils, Apr-Jun.
- 9. Calyx 1.5-2 mm long, uniformly herbaceous in texture and persistent; plants with erect stems 5-15 cm tall . . . . .  
. . . . . **C. micrantha** (Torr.) Johnston  
(Redroot cryptanth) AnnForb, uncom in sandy areas in warm desert, pinyon-juniper/oak, & sagebrush, Mar-May.
- 8. Stems taller than wide; flowers in an elongated, often coiled raceme (*C. gracilis* can have ball-like flower heads when immature ); roots not producing a red dye
- 10. Nutlets all smooth
  - 11. Nutlets typically one per flower; inflorescence ball-like or branches short . . . . . **C. gracilis** Osterh.  
(Slender cryptanth) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper/oak, Apr-Jul.
  - 11. Nutlets typically four per flower; inflorescence branches elongate . . . . . **C. fendleri** (Gray) Greene  
(Sand dune cryptanth) AnnForb, uncom in sandy areas of sagebrush, pinyon-juniper/oak, & montane conifer, May-Jul.
- 10. Nutlets all rough or mixture of rough and smooth
  - 12. Stem pubescence of ascending and appressed hairs; nutlets typically one per flower
  - 13. Calyx and nutlet straight . . . . . **C. decipiens** (Jones) Heller  
(Beguiling cryptanth) AnnForb, uncom in warm desert & pinyon-juniper, Apr-May.
  - 13. Calyx and nutlet recurved or bent at maturity . . . . . **C. recurvata** Cov.  
(Recurved cryptanth) AnnForb, rare in desert shrub in Huber Wash, Apr-May.
  - 12. Stem pubescence of spreading hairs; nutlets usually 4 per flower (often 1-2 in *C. barbiger*)
  - 14. Calyx of coarse, rough, spreading hairs but not woolly; leaves mostly 1-4 cm long and 1-4 mm wide; nutlets ovate with inconspicuous rough warty patterns on the surface . . . **C. ambigua** (Gray) Greene  
(Obscure cryptanth) AnnForb, uncom in sagebrush, pinyon-juniper/oak, & montane conifer, May-Jul.
  - 14. Calyx of woolly hairs; leaves mostly 4-8 cm long and 4-10 mm wide; nutlets lance-shaped . . . . .  
. . . . . **C. barbiger (Gray) Greene  
(Bearded cryptanth) AnnForb, uncom in warm desert & pinyon-juniper, Apr-May.**

**Eriodictyon** (Yerba santa)

**E. angustifolium** Nutt. (Yerba santa) Shrub, uncom in warm desert & pinyon-juniper, May-Jun.

**Eucrypta** (Eucrypta)

**E. micrantha** (Torr.) Heller (Desert eucrypta) AnnForb, rare in warm desert, Apr-Jun.

**Hackelia** (Stickseed)

- 1. Corolla predominantly white with a pale blue center or veins; fornices (raised, bump-like structures on the upper surface of the corolla limb at the base of each lobe) hairy . . . . .  
. . . . . **H. patens** (Nutt.) Johnston **var. harrisonii** Gentry  
(Harrison's stickseed) PerForb, uncom in sagebrush, pinyon-juniper, & montane conifer, Jun-Aug.
- 1. Corolla predominantly blue or pink with a white or yellow center; fornices glabrous
  - 2. Corolla limb 6-11 mm wide; plants with numerous stems from a woody, branched caudex . . . . .  
. . . . . **H. micrantha** (Eastw.) Gentry  
(Smallflower stickseed) PerForb, uncom in pinyon-juniper, sagebrush, oak, & montane conifer, Jun-Aug.
  - 2. Corolla limb 3-6 mm wide; plants often with a single stem from a taproot . . . **H. floribunda** (Lehm.) Johnston  
(Showy stickseed) PerForb, uncom in pinyon-juniper, sagebrush, oak, montane conifer, & wetlands, Jun-Aug.

**Heliotropium** (Heliotrope)

**H. convolvulaceum** (Nutt.) Gray (Bindweed heliotrope) AnnForb, rare in sandy areas of warm desert, sagebrush & pinyon-juniper, May-Sep (*Euploca convolvulacea* ssp. *californica*).

**Hesperochiron** (Hesperochiron)

**H. pumilus** (Griseb.) Porter (Dwarf hesperochiron) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jun.

**Hydrophyllum** (Waterleaf)

**H. occidentale** (Wats.) Gray var. **watsonii** Gray (Western waterleaf) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jun.

**Lappula** (Stickseed)

**L. occidentalis** (Wats.) Greene var. **cupulata** (Gray) Higgins (Cupseed stickseed) AnnForb, com in disturbed sites, warm desert, sagebrush, pinyon-juniper/oak, & montane conifer (*L. texana*, *L. redowskii* var. *cupulata*).

**Lithospermum** (Stoneseed, Gromwell)

1. Corolla lobes distinctly wavy-toothed, corolla tube 15-35 mm long; flowers bright yellow . . . . . **L. incisum** Lehm. (Showy stoneseed) PerForb, uncom in pinyon-juniper, oak, & montane conifer, Apr-Jul.
1. Corolla lobes entire, corolla tube less than 13 mm long; flowers greenish yellow, yellow, or orangish
  2. Flowers bright yellow, of two types (some with anthers located near the middle of the corolla tube below the style and others with the anthers located near the rim of the corolla, above the style); roots dye newsprint reddish-purple when dried in a plant press . . . . . **L. multiflorum** Torr. (Southwestern stoneseed) PerForb, uncom in pinyon-juniper/oak, & montane conifer, Jun-Aug.
  2. Flowers light greenish-yellow, of a single type with anthers located near the rim of the corolla just above the style . . . . . **L. ruderale** Dougl. ex Lehm. (Western stoneseed) PerForb, rare in pinyon-juniper, oak, & montane conifer, Apr-Jun.

**Mertensia** (Bluebell)

1. Stems less than 30 cm tall; stem leaves 0.5-2 cm wide, lacking distinct lateral veins, pubescent on upper surface . . . . . **M. fusiformis** Greene (Spindle-rooted bluebell) PerForb, rare in pinyon-juniper, oak, sagebrush, & montane conifer, May-Jun.
1. Stems 40-100 cm tall; stem leaves 1.5-7 cm wide, with distinct lateral veins, glabrous or pubescent on upper surface
  2. Leaves glabrous on both sides (sometimes with thick pustule-like bases present on upper surface but without an associated hair); calyx glabrous except for ciliate margins . . . . . **M. arizonica** Greene (Aspen bluebell) PerForb, uncom in pinyon-juniper/oak, montane conifer, & wetlands, Jun-Aug.
  2. Leaves pubescent with stiff, appressed hairs on upper side; calyx pubescent on surface and ciliate on margins . . . . . **M. franciscana** Heller (Franciscan bluebell) PerForb, uncom in montane conifer & wetlands, Jun-Aug.

**Pectocarya** (Combseed)

**P. setosa** Gray (Saucer combseed) AnnForb, uncom in rocky warm desert sites, Apr-Jun.

**Phacelia** (Phacelia)

1. Stamens exerted from the corolla for more than 2 mm; plants annual, biennial, or perennial
  2. Leaves entire or with 1-2 pairs of entire lateral lobes, green to grayish with long, bristly non-glandular hairs and shorter glandular hairs; seeds not deeply channeled on lower surface . . . . . **P. heterophylla** Pursh (Wand phacelia) PerForb, common in pinyon-juniper, oak, sagebrush, & montane conifer, Jun-Aug.
  2. Leaves pinnately divided with irregularly lobes or toothed margins (simple with rounded teeth in *P. palmeri*), densely glandular hairy throughout or with mix of short non-glandular and glandular hairs; seeds deeply channeled on lower surface
    3. Corolla bell-shaped, purple, corolla tube nearly equal in length to the calyx . . . . . **P. ambigua** Jones (Jones' phacelia) AnnForb, uncom in warm desert, Mar-May (*P. crenulata* var. *ambigua*).
    3. Corolla tubular, pale lavender to white, corolla tube longer than the calyx
      4. Mature seeds 3.5-4 mm long, brown; stems leaves nearly sessile, often clasping . . . . . **P. rafaensis** Atwood (San Rafael phacelia) PerForb, uncom in warm desert & pinyon-juniper, Apr-Jun (included in *P. constancei* by some authors).
      4. Mature seeds 2.5 mm long, black; stem leaves petioled . . . . . **P. palmeri** Torr. ex Wats. (Palmer's phacelia) PerForb, uncom in gypsum soils in warm desert, Apr-Jun.
1. Stamens included in the corolla or exerted for less than 2 mm; plants all annual
  5. Leaves simple, margins entire or shallowly lobed
    6. Corolla 6-15 mm long, broadly bell-shaped, more than twice as long as the calyx . . . . . **P. pulchella** Gray var. **pulchella** (Pretty phacelia) AnnForb, uncom in gypsum soils in warm desert, Apr-May
    6. Corolla 3-5 mm long, tubular to narrowly bell-shaped, about equal to the calyx
      7. Inflorescence head-like, nearly sessile in axils of leaves; leaf petioles often equaling or longer than the blade . . . . . **P. cephalotes** Gray (Chinle phacelia) AnnForb, uncom in Chinle soils in warm desert & pinyon-juniper, Apr-May.



7. Inflorescence elongate and curved at tip, borne on a long stalk; leaf petioles shorter than blades . . . . . **P. curvipes** Torr. ex Wats.  
(Washoe phacelia) AnnForb, rare in warm desert & pinyon-juniper, Apr-Jun.
5. Leaves pinnately compound or deeply pinnately lobed and divided
8. Ovules 4 per fruit; seeds pitted or reticulated on surface; leaves mostly on stems, not in a basal rosette
9. Corolla 4-7 mm long, tubular, equaling or shorter than the calyx . . . . . **P. cryptantha** Greene  
(Cryptanth phacelia) AnnForb, uncom in warm desert & pinyon-juniper, May-Jun.
9. Corolla 6-12 mm long, bell-shaped, longer than the calyx . . . . . **P. vallis-mortae** Voss  
(Death Valley phacelia) AnnForb, rare in warm desert & pinyon-juniper, Mar-Jun.
8. Ovules more than 10 per fruit; seeds encircled by a series of prominent raised ridges; leaves on stems and in a basal rosette
10. Corolla 6-16 mm long, bell-shaped, lavender, blue or purple (rarely white) with a yellow tubular base, more than twice as long as the calyx . . . . . **P. fremontii** Torr. in Ives  
(Fremont's phacelia) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Apr- May
10. Corolla 2.5-5 mm long, tubular, white with a yellow tubular base, shorter than or barely exceeding the calyx
11. Inflorescence elongate, projected well above the leafy part of the stem; calyx lobes spoon-shaped . . . . . **P. affinis** Gray  
(Twin phacelia) AnnForb, rare in warm desert, Apr-May.
11. Inflorescence short, not projected much above or shorter than the leafy part of the stem; calyx lobes not spoon-shaped . . . . . **P. ivesiana** Torr. in Ives  
(Ives' phacelia) AnnForb, uncom in sandy warm desert, sagebrush, & pinyon-juniper/oak, Apr-Jun.

**Plagiobothrys** (Popcorn-flower)

**P. tenellus** (Nutt.) Gray (Slender popcorn-flower) AnnForb, rare in pinyon-juniper & montane conifer, Apr-Jun.

**Tricardia** (Three hearts)

**T. watsonii** Torr. ex Wats. (Three hearts) PerForb, Reported by Nelson (1976) from warm desert scrub, Apr-May.

**Brassicaceae or Cruciferae** (Mustard Family)

1. Plants in fruit . . . . . Group 1
1. Plants in flower . . . . . Group 2

**Group 1. Plants in fruit**

1. Mature fruit less than 4 times as long as wide (not including the style)
2. Fruits distinctly 2-sided and flattened, not bladderly-inflated
3. Fruits with a single seed, margins of fruit flattened, wing-like, and scalloped or notched . . . **Thysanocarpus**
3. Fruits with 2-many seeds, margins of fruit entire, not flattened, wing-like, scalloped, or notched
4. Fruits flattened parallel to septum (the line of dehiscence of the two parts of the fruit does not run down the center of the flattened face of the fruit wall)
5. Leaves mostly all basal and in a rosette, or with 1-2 additional leaves along stem near base . . . . . **Draba**
5. Leaves 2-several, borne all along the stem, not in a basal clump . . . . . **Alyssum**
4. Fruits flattened at a right angle to the septum (line of dehiscence of the two parts of the fruit runs down the center of the flattened face of the fruit wall)
6. Plants pubescent with at least some forked or star-shaped hairs
7. Stem leaves sessile and auriculate (eared), basal leaves deeply pinnately lobed; fruits triangular, notched at the top . . . . . **Capsella**
7. Stem leaves short-stalked or sessile but not auriculate, basal leaves shallowly lobed; fruits rectangular, notched at the base . . . . . **Dimorphocarpa**
6. Plants glabrous or pubescent with simple hairs
8. Fruits heart-shaped at the base, tapered to a point at the tip with an elongate style; plants pubescent; leaves only on the stem, shallowly toothed and auriculate . . . . . **Cardaria**
8. Fruits rounded or tapering at the base, notched or heart-shaped at the tip with an elongate style or the style shorter and contained within the apical notch; plants glabrous or pubescent; leaves on stems and in a basal rosette, or if only on the stem then perfoliate-clasping or sessile but not auriculate
9. Plants glabrous, perennial; fruits heart-shaped at tip and tapered at the base; style 1.5-2.2 mm long; basal leaves spoon-shaped and shallowly toothed . . . . . **Noccaea**
9. Plants glabrous to pubescent, annual or perennial; fruits notched (sometimes shallowly) at tip and rounded at base; styles 0-1 mm long; basal leaves lacking or linear to narrowly oblanceolate, usually pinnately lobed . . . . . **Lepidium**
2. Fruits rounded to 4-sided in cross-section or bladderly-inflated

- 10. Plants glabrous or pubescent with simple hairs; fruits ovoid to pear-shaped . . . . . **Rorippa**
- 10. Plants pubescent, at least some hairs branched or stellate; fruits inflated and bladderly or narrowly elliptic, linear, or club-shaped
  - 11. Plants perennial; stem leaves simple and entire or merely toothed; fruits inflated and bladderly . . **Physaria**
  - 11. Plants annual; stem leaves compound or deeply pinnately lobed; fruits narrowly elliptic, linear, or club-shaped . . . . . **Descurainia**
- 1. Mature fruit over 4 times as long as wide
  - 12. Pubescence of star-shaped or forked hairs
    - 13. Hairs T-shaped, sessile, appressed to the leaf or stem surface
      - 14. Flowers yellow; stems and leaves densely pubescent; fruits terete or 4-sided . . . . . **Erysimum**
      - 14. Flowers white, pink, or lavender (but not yellow); herbage often glabrate; fruits flattened . . . . . **Boechea**
    - 13. Hairs with 3 or more branches, or if 2-branched hairs Y-shaped (forked), rather than T-shaped
      - 15. Leaves compound or deeply pinnatifid . . . . . **Descurainia**
      - 15. Leaves simple
        - 16. Fruits less than 8 times as long as wide, oval to elliptic but not linear . . . . . **Draba**
        - 16. Fruits 8 or more times as long as wide, linear
          - 17. Fruits distinctly flattened; plants perennial . . . . . **Boechea**
          - 17. Fruits terete or nearly round in cross-section; plants annual . . . . . **Malcolmia**
    - 12. Pubescence all of simple hairs or plants glabrous
      - 18. Fruit tapers to a stalk-like base at least 7 mm long, jointed to the pedicel . . . . . **Stanleya**
      - 18. Fruit not tapering at base (or stalk-like base much less than 7 mm long in *Thelypodium*) and not jointed to the pedicel
        - 19. Plants glandular-hairy . . . . . **Chorispora**
        - 19. Plants not glandular-hairy
          - 20. Fruits less than 8 times as long as wide, broader than linear; leaves (at least some) pinnately compound; plants perennial and rooting at nodes . . . . . **Nasturtium**
          - 20. Fruits 8 or more times longer than wide, linear; leaves simple and entire to coarsely toothed or pinnately divided; plants perennial or annual but not rooting at nodes
            - 21. Fruits definitely flattened
              - 22. Fruits drooping at maturity, with a beak 3-10 mm long at tip . . . . . **Streptanthella**
              - 22. Fruits erect, spreading, or descending, not beaked or beak less than 3 mm long
                - 23. Leaves heart-shaped, petioled, 1.5-5 cm wide . . . . . **Cardamine**
                - 23. Leaves not heart-shaped, sessile to petioled, up to 4 cm wide
                  - 24. Plants glabrous; middle and upper leaves cordate-clasping, some over 1 cm wide; sepals 6 mm or more long . . . . . **Streptanthus**
                  - 24. Plants glabrate or pubescent; middle and upper leaves sessile or auriculate, but not cordate-clasping and less than 1 cm wide; sepals less than 6 mm long . . . . . **Boechea**
          - 21. Fruits terete or 4-angled, but not flattened
            - 25. Styles beak-like, 1-3 mm long; stem leaves not auriculate
              - 26. Plants biennial; fruits indented between the seeds, giving the appearance of a string of beads . . . . . **Thelypodium**
              - 26. Plants annual; fruits not indented between the seeds . . . . . **Brassica**
            - 25. Styles not beak-like, less than 1 mm long or obsolete; stem leaves auriculate or not
              - 27. Plants annual
                - 28. Leaves entire; stem leaves auriculate . . . . . **Conringia**
                - 28. Leaves pinnatifid; stem leaves not auriculate . . . . . **Sisymbrium**
              - 27. Plants perennial
                - 29. Basal leaves entire to slightly toothed but not pinnately divided or lobed . . . . . **Arabis**
                - 29. Basal leaves pinnately divided or lobed
                  - 30. Stem leaves auriculate and pinnatifid; style to 1 mm long . . . . . **Nasturtium**
                  - 30. Stem leaves not auriculate, entire; style obsolete . . . . . **Caulanthus**

**Group 2. Plants in flower**

- 1. Hairs branched, at least in part
  - 2. Hairs T-shaped (with the basal stalk forming the leg of the T), branches of the T nearly appressed to the leaf or stem surface
    - 3. Flowers yellow (rarely reddish or purplish) . . . . . **Erysimum**
    - 3. Flowers white, pink, or lavender (but not yellow) . . . . . **Boechea**
  - 2. Hairs with 3 or more branches, or if 2-branched hairs Y-shaped (forked), rather than T-shaped
    - 4. Upper stem leaves auriculate or clasping
      - 5. Plants annual . . . . . **Capsella**

- 5. Plants perennial . . . . . **Boechera**
- 4. Upper stem leaves not auriculate or clasping
  - 6. Leaves pinnately compound or deeply lobed . . . . . **Descurainia**
  - 6. Leaves simple and entire or shallowly toothed, not pinnately divided or lobed
    - 7. Petals yellow, at least when fresh (sometimes fading to whitish)
      - 8. Leaves only along the stem, not in a basal rosette; petals 1.8-3 mm . . . . . **Alyssum**
      - 8. Leaves along stem and in a basal rosette or only in a basal rosette; petals over 5 mm long
        - 9. Styles less than 1.2 mm long; leaves primarily all in a basal rosette . . . . . **Draba**
        - 9. Styles over 1.5 mm long; leaves along stem and in a basal rosette . . . . . **Physaria**
    - 7. Petals white, purple, or pink, not yellow
      - 10. Plants biennial or perennial . . . . . **Boechera**
      - 10. Plants annual
        - 11. Petals 6-11 mm long, pink or purplish . . . . . **Malcolmia**
        - 11. Petals 0.8-8 mm long, white
          - 12. Stem leaves shallowly lobed or toothed; petals 4.8-8 mm long . . . . . **Dimorphocarpa**
          - 12. Stem leaves entire or almost absent (only near base of stem above rosette of spoon-shaped, mostly entire basal leaves; petals 1.8-4.5 mm long
            - 13. Leaves mostly in a basal rosette, stem leaves (if present) only near base . . . . . **Draba**
            - 13. Leaves only borne along the stem, basal rosette lacking . . . . . **Alyssum**
- 1. Hairs all simple or plants glabrous
  - 14. Plants glandular . . . . . **Chorispora**
  - 14. Plants not glandular
    - 15. Petals lacking or less than 0.5 mm long . . . . . **Lepidium**
    - 15. Petals present, 0.5 mm or more long
      - 16. Petals yellow (sometimes drying white in *Conringia* and *Sisymbrium*)
        - 17. Upper leaves auriculate or clasping the stem
          - 18. Leaves dimorphic; stem leaves perfoliate-clasping and entire; basal leaves divided into linear segments . . . . . **Lepidium perfoliatum**
          - 18. Leaves not dimorphic; stem leaves not perfoliate-clasping, either entire or pinnately lobed; basal leaves entire or pinnately lobed but not divided into linear segments
            - 19. Plants glabrous throughout, glaucous; leaves with entire margins . . . . . **Conringia**
            - 19. Plants glabrous or sparsely pubescent on lower stem with simple hairs, not glaucous; lower leaves with toothed margins . . . . . **Brassica**
        - 17. Upper leaves not auriculate or clasping the stem
          - 20. Sepals 8-16 mm long; ovary and young fruit stalked at base for at least 5 mm (located beyond the pedicel) . . . . . **Stanleya**
          - 20. Sepals less than 8 mm long; ovary and young fruit without a stalk (other than the pedicel)
            - 21. Petals less than 1 mm long . . . . . **Rorippa**
            - 21. Petals 3 mm or more long
              - 22. Plants perennial; leaves entire, absent or nearly so from stem, clustered in a basal rosette . . . . . **Draba**
              - 22. Plants annual; leaves pinnately compound or toothed and deeply lobed at base, borne along the stem, sometimes also in a basal rosette that may wither by anthesis
                - 23. Leaves pinnately compound, on stem and in basal rosette . . . . . **Sisymbrium**
                - 23. Leaves simple or lobed at the base but not pinnately compound, leaves mostly on the stem . . . . . **Brassica**
  - 16. Petals white, purple, pink, lavender, or brownish
    - 24. Upper stem leaves auriculate or clasping the stem
      - 25. Leaves pinnately compound or lobed . . . . . **Nasturtium**
      - 25. Leaves simple, entire to merely toothed
        - 26. Petals 2-7 mm long
          - 27. Plants annual; petals 1-1.7 mm long . . . . . **Thysanocarpus**
          - 27. Plants perennial; petals 2-7 mm long
            - 28. Leaves borne only along the stem, basal rosette not present; rhizomatous . . . . . **Cardaria**
            - 28. Leaves borne along stem and in a well-developed basal rosette; stems from a branched caudex but not rhizomatous
              - 29. Plants glabrous; petals 5-7 mm long, white . . . . . **Noccaea**
              - 29. Plants pubescent; petals 3-5 mm long, white to pale lavender . . . . . **Arabis**
      - 26. Petals 7-18.5 mm long
        - 30. Uppermost stem leaves rounded to truncate at tip, lower leaves toothed apically; flowers brownish or brownish-purple . . . . . **Streptanthus**

- 30. Uppermost stem leaves (if any) attenuate to acute at tip, lower leaves not toothed apically; flowers white, pink, or purple . . . . . **Boechea**
- 24. Upper stem leaves not auriculate or clasping the stem
  - 31. Petals 9-18.5 mm long, purple or drying brownish; sepals 5-12 mm long; stems glaucous, often inflated near base and hollow . . . . . **Caulanthus**
  - 31. Petals 0.5-9 mm long (to 12 mm long in *Cardamine*), white or pinkish purple; sepals 0.5-5 mm long; stems not glaucous, inflated, or hollow
    - 32. Petals less than 4 mm long; sepals 0.5-2 mm long . . . . . **Lepidium**
    - 32. Petals over 4 mm long; sepals mostly over 2 mm long
      - 33. Plants perennial
        - 34. Leaves heart-shaped, petioled, 1.5-5 cm wide . . . . . **Cardamine**
        - 34. Leaves not heart-shaped; sessile, less than 1 cm wide . . . . . **Boechea**
      - 33. Plants annuals or biennials
        - 35. Plants annual; flowers few in simple, elongate racemes . . . . . **Streptanthella**
        - 35. Plants biennial; flowers numerous in a compound, flat-topped or ball-like raceme . . . . . **Thelypodium**

**Alyssum** (Alyssum)

- 1. Fruits glabrous . . . . . **A. desertorum** Stapf  
(Desert alyssum) AnnForb, native to Europe. Locally com in disturbed areas in Zion Canyon, Mar-May.
- 1. Fruits pubescent . . . . . **A. simplex** Rud.  
(Small alyssum) AnnForb, native to Europe. Locally com in disturbed areas in Zion Canyon and along K-T Road, Mar-May (*A. parviflorum* var. *micranthum*).

**Arabis** (Rockcress)

See *Boechea*

**A. hirsuta** (L.) Scop. (Hairy rockcress) PerForb, reported by Ott (2010), sagebrush and montane conifer, Jun-Aug.

**Boechea** (Rockcress)

- 1. Mature fruits erect or ascending; stem hairs simple and hirsute or forked with branches appressed to surface
  - 2. Hairs on stem and leaves forked with branches appressed to surface; fruit flattened, 1.5-3 mm wide . . . . . **B. stricta** (Graham) Al-Shehbaz  
(Drummond's rockcress) PerForb, uncom in sagebrush, pinyon-juniper/oak, & montane conifer, May-Sep (*Boechea drummondii*, *B. angustifolia*, *Arabis drummondii*).
  - 2. Hairs on stem simple and spreading; fruits round, 1-1.5 mm wide . . . . . see **Arabis**
- 1. Mature fruits descending or spreading; stems pubescent with simple, or multi-branched hairs (if forked then hairs\ long-stalked)
  - 3. Basal leaves ciliate on margins with long simple hairs or forked hairs, but not with short multi-branched hairs, often glabrate on surface or with variously forked hairs
    - 4. Stems usually single or few, mostly 25-60 cm tall; stem leaves numerous and overlapping . . . . . **B. fendleri** (Wats.) Weber  
(Fendler's rockcress) PerForb, uncom in pinyon-juniper, oak, & montane conifer, Apr-Aug (*Arabis holboellii* var. *fendleri*, *A. fendleri*).
    - 4. Stems several, mostly 10-30 cm tall; stem leaves few, widely spaced and not overlapping . . . . . **B. demissa** (Greene) Weber  
(Nodding rockcress) PerForb, rare in pinyon-juniper, oak, & montane conifer, May-Aug (*Arabis demissa*).
  - 3. Basal leaves densely pubescent on surface and margins with short, multi-branched forked hairs (sometimes also with a mix of long straight hairs)
    - 5. Basal leaves narrowly oblanceolate to linear, often inrolled, entire, not much larger than stem leaves; petals 8-11 mm long; fruits usually finely pubescent (occasionally glabrous) . . . . . **B. pulchra** (Jones ex Wats.) Weber var. **gracilis** (Jones) Dorn  
(Desert rockcress) PerForb, rare in warm desert, sagebrush, & pinyon-juniper, Mar-Jun (*Arabis pulchra* var. *munciensis*, *Boechea lincolnensis*).
    - 5. Basal leaves spoon-shaped to broadly oblanceolate, flat, entire or toothed, larger than the stem leaves; petals 4-8 mm long; fruits glabrous
      - 6. Fruit stalks spreading horizontally to slightly ascending (fruits themselves spreading to descending); basal leaves usually coarsely toothed; stems usually 3 or more and arising below and to the side of the basal tuft of leaves . . . . . **B. perennans** (Wats.) Weber  
(Perennial rockcress) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Mar-Jul (*Arabis perennans* var. *perennans*).

6. Fruit stalks and fruits spreading horizontally to sharply descending; basal leaves usually entire or with few shallow teeth; stems usually single (occasionally 2-3) from the center of the basal tuft of leaves . . . . . **B. holboellii** (Hornem.) Löve & Löve
7. Fruit stalks spreading horizontally to gradually arching downwards; pubescence of lower stems of coarse, multi-branched hairs mixed with simple or forked hairs . . . . . **var. pinetorum** (Tidestr.) Dorn (Holboell's rockcress) PerForb, uncom in pinyon-juniper, oak, montane conifer, & wetlands, May-Jul (*Arabis holboellii* var. *pinetorum*).
7. Fruit stalks abruptly and sharply descending; pubescence of lower stems of short, appressed, multi-branched hairs . . . . . **var. secunda** (Howell) Dorn (Holboell's rockcress) PerForb, uncom in pinyon-juniper, oak, sagebrush, & montane conifer, May-Jul (*Arabis holboellii* var. *secunda*, *B. retrofracta*).

**Brassica** (Mustard)

1. Upper stem leaves auriculate (eared) at base and clasping stem; fruiting stalks 10-20 mm long, widely-spreading . . . . . **B. rapa** L. (Field mustard) AnnForb, introduced from Europe, rare in disturbed areas, May-Jun (*B. campestris*).
1. Upper stem leaves not auriculate at base or clasping stem; fruiting stalks 2-10 mm long, erect rather than spreading
  2. Mature fruits 2.2-4.2 cm long with a narrow beak 6-10 mm long; fruiting stalks 4-10 mm long, erect but not closely appressed to the stem . . . . . **B. juncea** (L.) Czernj. (Indian mustard) AnnForb, introduced from Asia, Historic in disturbed areas, May-Jul.
  2. Mature fruits 0.8-2 cm long with a narrow beak 1-3 mm long; fruiting stalks 2-5 mm long, closely appressed to the stem . . . . . **B. nigra** (L.) Koch (Black mustard) AnnForb, introduced from Europe, Historic in disturbed areas, May-Aug (*Sinapis nigra*).

**Capsella** (Shepherd's purse)

**C. bursa-pastoris** (L.) Medic. (Shepherd's-purse) AnnForb, introduced from Europe, uncom in disturbed areas, Apr-Sep.

**Cardamine** (Bittercress)

**C. cordifolia** Gray **var. cordifolia** (Heartleaf bittercress) PerForb, Reported by Ott (2010), wetlands, Jun-Aug.

**Cardaria** (Whitetop)

**C. draba** (L.) Desv. (Whitetop) PerForb, introduced from Europe, uncom in disturbed areas, May-Aug (*Lepidium draba*).

**Caulanthus** (Spindlestem)

**C. crassicaulis** (Torr.) Wats. **var. glaber** Jones (Smooth spindlestem) PerForb, uncom in pinyon-juniper, oak, and montane conifer, May-Jul. Type locality near Alton, UT.

**Chorispora** (Blue mustard)

**C. tenella** (Pallas) DC. (Blue mustard) AnnForb, native to Asia, uncom in disturbed areas, Apr-Jun.

**Conringia** (Hare's ear mustard)

**C. orientalis** (L.) Dumort (Hare's ear mustard) AnnForb, native to Europe, uncom in disturbed areas, warm desert, and pinyon-juniper on clay, Apr-Aug.

**Descurainia** (Tansy-mustard)

1. Upper leaves twice or thrice pinnately divided; fruits narrowly linear, usually over 20 mm long; seeds more than 20 . . . . . **D. sophia** (L.) Webb ex Prantl (Flixweed) Annual forb uncommon in warm desert, sagebrush, pinyon-juniper, & disturbed areas, introduced from Europe, Mar-Aug.
1. Upper leaves once to twice pinnately divided; fruits club-shaped to linear-elliptic, less than 15 mm long; seeds less than 20
  2. Mature fruits 2.5-4.5 mm long, elliptic; seeds 1-3 per locule . . . . . **D. californica** (Gray) Schulz (California tansy-mustard) Annual or biennial forb, uncom in pinyon-juniper, sagebrush, & montane conifer, Jun-Sep.
  2. Mature fruits 4-15 mm long, linear to club-shaped; seeds 4 or more per locule
    3. Fruits linear to elliptic, pointed at tip; replum 1-nerved; seeds in 1 row per locule . . . . . **D. incana** (Bernh. ex Fisch. & Mey.) Dorn

4. Fruits and fruit stalks erect and appressed to stem axis . . . . . **var. brevipes** (Nutt. ex Torr. & Gray) Welsh (Gray tansy-mustard) Annual or biennial forb, uncom in montane conifer woods, Apr-Jun.
4. Fruits and fruit stalks erect to ascending but not appressed to the stem axis . . . **var. incisa** (Engelm.) Welsh (Mountain tansy-mustard) Annual or biennial forb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jul (*D. incana* var. *sonnei*, *D. incisa* var. *incisa*).
3. Fruits club-shaped to elliptic, rounded at tip; replum nerveless; seeds at least partially in 2 rows per locule . . . . . **D. pinnata** (Walter) Britt.
5. Fruits 4-7 mm long; inflorescence glabrous or nearly so . . . . . **var. glabra** (Woot. & Standl.) Shinnars (Western tansy-mustard) Annual or biennial forb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & wetlands, Mar-Aug.
5. Fruits 7-15 mm long; inflorescence pubescent or glandular . . . . . **var. osmiarum** (Cock.) Shinnars (Western tansy-mustard) Annual or biennial forb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Mar-Aug (*D. pinnata* ssp. *halictorum*).

**Dimorphocarpa** (Spectacle-pod)

**D. wislizeni** (Engelm.) Rollins (Spectacle-pod) AnnForb, rare in sandy soils in warm desert, sagebrush, pinyon-juniper, & montane conifer, Apr-Sep (*Dithyrea wislizeni*).

**Draba** (Draba, Whitlow-grass)

1. Plants perennial; flowers yellow; fruits glabrous with a style over 1 mm long . . . . . **D. zionensis** C.L. Hitchc. (Zion draba) PerForb, uncom on Navajo Sandstone slickrock, Apr-Jun (*D. asprella* var. *zionensis*). Type locality is Zion Canyon.
1. Plants annual; flowers white; fruits pubescent or with a style less than 0.3 mm long
  2. Pubescence of leaves and lower stems of simple or branched hairs; stalks of fruit usually glabrous . . . . . **D. reptans** (Lam.) Fern. (Dwarf draba) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper, & oak, Apr-Jul.
  2. Pubescence of leaves and lower stems star-shaped hairs (with 2-5 branches); stalks of fruit usually pubescent . . . . . **D. cuneifolia** Nutt. ex T. & G. **var. cuneifolia** (Wedgeleaf draba) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Feb-Jul.

**Erysimum** (Wallflower)

1. Petals 12-20 mm long; plants biennial or perennial . . . . . **E. asperum** (Nutt.) DC. **var. purshii** Durand (Sand dune wallflower) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Aug (*E. capitatum* var. *capitatum*).
1. Petals 3.5-11 mm long; plants annual . . . . . **E. repandum** L. (Spreading wallflower) AnnForb, rare in disturbed areas & pinyon-juniper on clay soils, introduced from Europe, May-Jun.

**Lepidium** (Pepperweed)

1. Leaves strongly dimorphic, upper stem leaves sessile and perfoliate-clasping, lower stem leaves 2-3 times pinnately divided into linear segments; plants annual; petals yellow . . . . . **L. perfoliatum** L. (Clasping pepperwort) AnnForb, uncom in warm desert, pinyon-juniper, & disturbed areas, May-Jul, introduced from Europe.
1. Leaves similar throughout or the lower stem and basal leaves more deeply pinnately lobed than the upper stem leaves, if 2-3 times pinnately divided into linear segments than the plants are perennial; upper stems leaves petiolate to sessile but not perfoliate-clasping; plants annual or perennial
  2. Style 0.3-1 mm long, exerted beyond the apex of the fruit; plants biennial or perennial
    3. Stems woody throughout; fruits obovate to round, 4.5-7.5 mm long . . . . . **L. fremontii** Wats. (Fremont's pepperwort) PerForb, uncom in warm desert, Apr-Jul.
    3. Stems herbaceous or woody only at the base; fruits elliptic to broadly oval but usually narrower than wide, 2-4.4 mm long . . . . . **L. montanum** Nutt.
    4. Basal leaves well-developed, usually over 5 cm long; stem leaves smaller, becoming reduced upwards; stems glabrate . . . . . **var. heterophyllum** (Wats.) C.L. Hitchc. (Cedar Canyon pepperwort) PerForb, rare in Kolob area in pinyon-juniper/oak zone, May-Jul, (*L. integrifolium* var. *heterophyllum*). Type locality is near Cedar City, UT.
    4. Basal leaves absent or poorly developed, shorter than 5 cm long; stem leaves largest, only gradually reduced upwards' stems glabrous to densely pubescent
    5. Plants perennial; stems glabrous or nearly so below the inflorescence, usually simple or with main stem longer than side stems . . . . . **var. jonesii** (Rydb.) C.L. Hitchc. (Jones' pepperwort) PerForb, common in warm desert, sagebrush, pinyon-juniper, & oak, Apr-Sep. Type locality is St. George, UT.

5. Plants biennial; stems sparsely to densely pubescent, simple or branched from the base with side stems about equal in size to central stem . . . . . **var. montanum**  
(Mountain pepperwort) PerForb, uncom in warm desert & pinyon-juniper, Apr-Sep.
2. Style less than 0.3 mm long and included within the apical notch of the fruit; plants annual
6. Stem leaves auriculate and sessile; basal leaves entire . . . . . **L. campestre** (L.) R. Br.  
(Field pepperwort) AnnForb, Reported by Ott (2010), May-Jul (*Neolepia campestris*).
6. Stem leaves not auriculate, short-petioled or sessile; basal leaves shallowly to deeply lobed
7. Fruit stalks round in cross-section or about as broad as thick
8. Petals lacking or less than 1 mm long and shorter than the sepals; fruits longer than the fruit stalks . . . . .  
. . . . . **L. densiflorum** Schrader **var. densiflorum**  
(Prairie pepperwort) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer,  
May-Jul.
8. Petals present, to 1.4 mm long and usually longer than the sepals; fruits shorter than the fruit stalks . . . . .  
. . . . . **L. virginicum** L. **var. pubescens** (Greene) Thell.  
(Poor-man's pepperwort) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane  
conifer, Apr-Aug (*L. virginicum* ssp. *menziesii*).
7. Fruit stalks strongly flattened, about twice as broad as thick
9. Stems typically single, erect; fruits glabrous . . . **L. densiflorum** Schrader **var. ramosum** (A. Nels.) Thell.  
(Prairie pepperwort) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer,  
May-Jul.
9. Stems typically several from the base with the outer stems spreading to decumbent; fruits pubescent . . . . .  
. . . . . **L. lasiocarpum** Nutt. ex Torr. & Gray
10. Fruit stalks glabrous or fine hairy; stems with short stiff hairs to glabrate . . . . .  
. . . . . **var. georginum** (Rydb.) C.L. Hitchc.  
(Hairy-pod pepperwort) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Mar-Jun.  
Type locality is Virgin, UT.
10. Fruit stalks with short stiff hairs; stems with long stiff hairs . . . . . **var. lasiocarpum**  
(Hairy-pod pepperwort), AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Mar-Jun.

**Malcolmia** (African mustard)

**M. africana** R. Br. (African mustard) AnnForb, uncom in warm desert shrub & disturbed areas, Apr-Jul, introduced from Africa (*Strigosella africana*).

**Nasturtium** (Watercress)

**N. officinale** R. Br. (Watercress) PerForb, uncom in wetlands, introduced from Europe, May-Sep (*Rorippa nasturtium-aquaticum*).

**Noccaea** (Pennycress)

**N. montana** (L.) F.K. Mey. (Alpine pennycress) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Aug (*Thlaspi montanum*).

**Physaria** (Twinpod, Bladderpod) - including *Lesquerella*

1. Fruits notched at tip, style attached within the notch (*Physaria*, *sensu stricto*)
2. Style 2-3 mm long, usually included within the notch at the tip of the fruit . . . . . **P. newberryi** Gray  
(Newberry's twinpod) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer,  
Mar-Jun.
2. Style 4-8 mm long, exceeding the notch at the tip of the fruit . . . . . **P. chambersii** Rollins
3. Hairs of the fruits and leaves stellate, each branch distinct to the base (need magnification to observe this, and it helps to scratch the surface of the leaf to thin out the hairs) . . . . . **var. chambersii**  
(Chamber's twinpod) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer,  
Apr-Aug.
3. Hairs of the fruits and leaves broadly scale-like (at least at center), with or without star-like branches along the margins (need magnification to observe) . . . . . **var. membranacea** Rollins  
(Lepidote twinpod) PerForb, uncom on Carmel Formation, especially W of Dakota Hill in pinyon-juniper & montane conifer, May-Aug (*P. lepidota* var. *membranacea*). Type locality is Red Canyon, Garfield Co., UT).
1. Fruits rounded or pointed at tip, style attached at the tip (*Lesquerella*)
4. Lowermost leaves often over 5 mm wide, forming a basal rosette, blade spoon-shaped, oval, or elliptic, distinct from petiole, basal and stem leaves of different shapes . . . . .  
. . . . . **P. kingii** (Watson) O'Kane & Al-Shehbaz var. **parvifolia** Maguire & A. Holmgren) Welsh  
(King's bladderpod) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer,  
Apr-Jul. Includes *P. wardii*, formerly split out based on fruits with rounded rather than compressed tips (*P.*

*kingii* ssp. *latifolia*, *Lesquerella kingii*, *L. wardii*).

4. Lowermost leaves narrow, mostly 1-5 mm wide, tufted at base of stem, blade and petiole indistinct (but petiolate in *L. rectipes*), basal and stem leaves similar in general shape
5. Plants less than 10 cm tall; basal leaves linear to narrowly spoon-shaped ..... ***P. intermedia*** (Watson) O'Kane & Al-Shehbaz (Watson's bladderpod) PerForb, uncom in sandy pinyon-juniper, sagebrush, oak, & montane conifer, May-Aug (*Lesquerella intermedia*).
5. Plants over 10 cm tall; basal leaves broadly spoon-shaped or oblanceolate
6. Pedicels generally recurved or straight in fruit; blades of basal leaves rarely more than 4 mm wide ..... ***P. ludoviciana*** (Nutt.) O'Kane & Al-Shehbaz (Silver bladderpod) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, May-Jun (*Lesquerella ludoviciana*).
6. Pedicels S-shaped in fruit; blades of basal leaves often more than 4 mm wide ..... ***P. rectipes*** (Woot. & Standl.) O'Kane & Al-Shehbaz (Colorado Plateau bladderpod) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Aug (*Lesquerella rectipes*).

***Rorippa*** (Yellowcress)

***R. curvipes*** Greene **var. *curvipes*** (Blunt-leaf yellowcress) PerForb, uncom in wetlands, May-Aug.

***Sisymbrium*** (Tumble mustard)

1. Fruit stalks as thick and stout as the fruit; fruits 5.5-8.5 cm long ..... ***S. altissimum*** L. (Tumble mustard) AnnForb, uncom in disturbed areas, introduced from Europe, May-Aug.
1. Fruit stalks more slender than the fruit; fruits 3.5-5 cm long ..... ***S. irio*** L. (London mustard) AnnForb; reported by Ott (2010), introduced from Europe, Apr-May.

***Stanleya*** (Prince's plume)

***S. pinnata*** (Pursh) Britt. **var. *pinnata*** (Prince's-plume) PerForb, uncom in warm desert & pinyon-juniper, Apr-Sep.

***Streptanthella*** (Fiddle-mustard)

***S. longirostris*** (Wats.) Rydb. (Long beak fiddle-mustard) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper/oak, Mar-Jun.

***Streptanthus*** (Twistflower)

***S. cordatus*** Nutt. ex T. & G. (Heartleaf jewelflower) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jul.

***Thelypodium*** (Thelypody)

1. Basal leaves entire to slightly toothed; stem leaves sessile ..... ***T. integrifolium*** (Nutt.) Endl. **var. *affine*** (Greene) Welsh & Reveal (Cousin thelypody) PerForb, uncom in wetlands, Jun-Sep.
1. Basal leaves pinnately compound; stem leaves petiolate ..... ***T. laxiflorum*** Al-Shehbaz (Slate thelypody) PerForb, uncom in pinyon-juniper/oak & montane conifer, May-Sep (*T. wrightii* var. *tenellum*).

***Thysanocarpus*** (Lacepod)

***T. curvipes*** Hook. **var. *eradiatus*** Jepson (Fringepod) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper, & oak, Mar-Jun.

**Cactaceae** (Cactus Family)

1. Stems subdivided into numerous flattened or cylindrical joints or pads; long spines (when present) in clusters associated with short, hair-like glassy spines (glochids)
  2. Stem joints cylindrical; spines covered by a detachable, papery sheath ..... ***Cylindropuntia***
  2. Stem joints flattened; spines not covered by a detachable, papery sheath ..... ***Opuntia***
1. Stems not subdivided into numerous flattened or cylindrical joints or pads, entire stem round or cylindrical; spines single or clustered, but not associated with short, hair-like glochids
  3. Stems ribbed; spine-bearing tubercles not grooved; flowers borne on lateral branches below the stem tip ..... ***Echinocereus***
  3. Stems not ribbed, spine-bearing tubercles arranged in a spiral and distinctly grooved on their upper side; flowers borne at the tip of the main stem ..... ***Coryphantha***



**Coryphantha** (Pincushion cactus)

**C. vivipara** (Nutt.) Britt. & Rose var. **vivipara** (Pincushion cactus) PerForb, rare in Crater Hill area, in warm desert & pinyon-juniper, Apr-Jul (*C. vivipara* var. *arizonica*, *Escobaria vivipara* var. *arizonica*).

**Cylindropuntia** (Cholla)

1. Stem joints slender, mostly less than 2 cm thick; flowers yellowish-green; fruits fleshy at maturity, yellow . . . . .  
 . . . . . **C. whipplei** (Engelm. & Bigelow) Knuth var. **whipplei**  
 (Whipple's cholla) Shrub, uncom in warm desert, sagebrush, & pinyon-juniper, May-Jul (*Opuntia whipplei*).
1. Stem joints stout, over 2.5 cm thick; flowers greenish yellow to brown; fruits dry at maturity, green to brown
  2. Joints at tips of stems usually over 15 cm long; raised tubercles narrowly elongate, over 3 times longer than wide; flowers usually greenish yellow to brown, stamen filaments red to magenta; spine sheaths straw-colored . . . . .  
 . . . . . **C. acanthocarpa** (Engelm. & Bigelow) Knuth var. **coloradensis** (L. Benson) Pinkava  
 (Buckhorn cholla) Shrub, uncom in warm desert scrub, May (= var. *acanthocarpa* in Fertig & Alexander 2009, *Opuntia acanthocarpa* var. *coloradensis*)
  2. Joints at tips of stems usually less than 15 cm long; raised tubercles only 1-2 times longer than wide; flowers usually yellowish-green, stamen filaments usually green to yellow (rarely red); spine sheaths straw-colored, silvery, or yellow . . . . . **C. echinocarpa** (Engelm. & Bigelow) Knuth  
 (Pale cholla) Shrub, Reported (Trapp 1969) from warm desert, Mar-Jun (*Opuntia echinocarpa*).

**Echinocereus** (Claret cup)

1. Stems usually solitary or few, 10-30 cm long; flowers 5-9 cm wide, pink purple when fresh, petals oblong, not rounded at tip . . . . . **E. engelmannii** (Parry ex Engelm.) Lem. **ssp. engelmannii**  
 (Engelmann's hedgehog cactus) PerForb, Uncom in warm desert, sagebrush, & pinyon-juniper, Mar-Jul (*E. engelmannii* var. *chrysocentrus*).
1. Stems densely clustered (often numbering more than 30), each 8-15 cm long; flowers 1.5-6 cm wide, scarlet when fresh, petals obovate and rounded at tip
  2. Spines glabrous (need high magnification); plants with mix of bisexual and functionally pistillate flowers (anthers sterile) . . . . . **E. coccineus** Engelm.  
 (Claretcup) PerForb, common in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jun (= *E. triglochidiatus* var. *melanacanthus* in Fertig & Alexander 2009)
  2. Spines with tiny rough hairs or bumps under high magnification; plants all with bisexual flowers . . . . .  
 . . . . . **E. mojavensis** (Engelm. & Bigelow) Rumpler  
 (Mojave claretcup) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jun. (= *E. triglochidiatus* var. *mojavensis*). Older floras distinguish Mojave claretcup based on the needles being twisted or curved rather than straight, but this is not a reliable characteristic. *E. mojavensis* is probably more common in Zion than originally suspected.

**Opuntia** (Prickly pear)

1. Long spines absent, only glochids present in each areole
  2. Flowers yellow . . . . . **O. aurea** Baxter  
 (Pipe Spring pricklypear) PerForb, common in pinyon-juniper, sagebrush, oak, and montane conifer, May-Jun. Hybridizes frequently with other *Opuntia* species (*O. erinacea* var. *aurea*).
  2. Flowers pink . . . . . **O. polyacantha** x **O. aurea** hybrids  
 PerForb, common in pinyon-juniper, sagebrush, and oak throughout Zion. Some specimens from Springdale and the Kolob Terrace Road just west of Zion NP may be *O. basilaris*.
1. Long spines and glochids present in each areole, or long spines only present in uppermost areoles
  3. Fruits dry at maturity, tan, usually spiny . . . . . **O. polyacantha** Haw.
  4. Areoles of uppermost 10% of pad with 1-few spines . . . . . **O. polyacantha** x **O. aurea** hybrids  
 Zion specimens may show introgression from *O. pinkavae*, a narrow endemic of the Arizona Strip and adjacent southern Utah.
  4. Areoles of uppermost half or more of pad with 5-20 spines
    5. Spines of two types: major spines mostly deflexed, 20-35 mm long, yellow-brown to gray, 1-3 per areole; minor spines deflexed, 5-15 mm long, white, 0-5 per areole . . . . . **var. polyacantha**  
 (Plains pricklypear) PerForb, Reported by Cogan et al. (2004), May-Jul. Zion material may be misidentified var. *erinacea* (according to Holmgren et al. 2012, var. *polyacantha* ranges much farther east).
    5. Spines all of similar form (though grading in length), ascending to deflexed or spreading, 7-18 per areole . . . . .  
 . . . . . **var. erinacea** (Engelm. & Bigelow) Parfitt  
 (Common pricklypear) PerForb, common in warm desert, sagebrush, & pinyon-juniper, May-Jun (*O. erinacea* var. *erinacea*). Includes reports of var. *utahensis*, a form with spines absent from the lower half of the stem joint and var. *ursina* with slender, flexible spines to 10 cm long.
3. Fruits fleshy at maturity, red or orange, often not spiny

6. Plants shrubby with a trunk to 30 cm tall; pads 15-20 cm long, nearly circular, bluish-green; spines yellow and all deflexed . . . . . **O. chlorotica** Engelm. & Bigelow (Pancake pricklypear) PerForb, uncom in warm desert scrub, Apr-Jul.
6. Plants not shrubby, stems prostrate or without an obvious trunk; pads mostly 5-40 cm long, obovate to spoon-shaped, usually longer than wide, bluish green to green; spines gray or brownish and spreading to deflexed
7. Pads 5-11 cm long x 3.5-7.5 cm wide . . . . . "**O. macrorhiza**" Engelm. – probably not true *macrorhiza* as cited by numerous authors, but a complex hybrid swarm involving *O. phaeacantha*, *O. engelmannii*, *O. aurea*, and *O. polyacantha*. True *O. macrorhiza* ranges much farther north and east of Zion. PerForb, common in warm desert, sagebrush, pinyon-juniper, & oak, May-Jun.
7. Pads 10-40 cm long x 9-25 cm wide
8. Largest pads 10-20 cm long x 9-15 cm wide . . . . . **O. phaeacantha** Engelm. (Large pricklypear) PerForb, common in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jul (*O. phaeacantha* var. *major*).
8. Largest pads 20-40 cm long x 15-25 cm wide . . . . . **O. engelmannii** Salm-Dyck ex Engelm. var. **engelmannii** (Frying pan cholla) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, & oak, Apr-Jul. (*O. phaeacantha* var. *discata*).

**Campanulaceae** (Bellflower Family) includes Lobeliaceae

1. Flowers regular, sessile, blue . . . . . **Triodanis**
1. Flowers irregular, stalked, scarlet or white with purple tips
  2. Plants annual; flowers less than 3 mm long, white with purple tips; anthers separate . . . . . **Nemacladus**
  2. Plants perennial; flowers over 25 mm long, scarlet; anthers fused into a cylinder (Lobeliaceae) . . . . . **Lobelia**

**Lobelia** (Lobelia)

**L. cardinalis** L. ssp. **graminea** (Lam.) McVaugh (Cardinal flower) PerForb, uncom in wetlands, Aug- Oct.

**Nemacladus** (Nemacladus)

**N. glanduliferus** Jepson var. **orientalis** McVaugh (Slender nemacladus) AnnForb, rare in warm desert & pinyon-juniper, Apr-Jun.

**Triodanis** (Venus' looking-glass)

**T. perfoliata** (L.) Nieuw. (Venus' looking-glass) AnnForb, uncom in sandy pinyon-juniper/oak, montane conifer, & wetlands. Introduced from Europe, Jun-Jul.

**Cannabaceae** (Hemp Family)

1. Trees or large shrubs; fruit a drupe; leaves simple with entire or toothed margins . . . . . **Celtis**
1. Vines or perennial forbs; fruit an achene; leaves simple but 3-7 lobed or palmately compound
  2. Rough-stemmed herbaceous vines with simple but coarsely 3-7 lobed leaves . . . . . **Humulus**
  2. Perennial forbs with palmately compound leaves with 5-9 toothed leaflets . . . . . **Cannabis**

**Cannabis** (Hemp)

**C. sativa** L. (Hemp, Marijuana) PerForb, probably extirpated; Introduced from Eurasia, Jul-Sep.

**Celtis** (Hackberry)

1. Leaves entire or with a few sparse teeth . . . . . **C. reticulata** Torr. (Netleaf hackberry) Tree, uncom in warm desert, pinyon-juniper/oak, and wetland areas, Apr-May.
1. Leaves regularly serrate-margined . . . . . **C. occidentalis** L. (Common hackberry) Tree, rare, introduced from eastern North America.

**Humulus** (Hops)

**H. lupulus** L. var. **neomexicanus** Nels. & Cockerell (Common hops) PerForb, uncom in wetlands, Jul-Aug.

**Caprifoliaceae** (Honeysuckle Family)

See Adoxaceae for *Sambucus*. Includes Valerianaceae

1. Shrubs; leaves simple; fruit a white berry . . . . . **Symphoricarpos**
1. Annual or perennial forbs; leaves simple, toothed, or pinnately lobed; fruit an achene

- 2. Plants annual from a taproot; stems often glandular above; corolla 2-5 mm long; calyx not expanding and forming a feathery pappus in fruit. . . . . **Plectritis**
- 2. Plants perennial from a slender rhizome; stems glabrous; corolla 7-13 mm long; calyx expanding into a feathery pappus in fruit . . . . . **Valeriana**

**Plectritis** (Plectritis)

**P. macrocera** Torr. & Gray (Plectritis) AnnForb, uncom in pinyon-juniper/oak, Apr-May

**Symphoricarpos** (Snowberry)

- 1. Corolla 10-18 mm long, salverform . . . . . **S. longiflorus** Gray  
(Long-flower snowberry) Shrub, uncom in warm desert, pinyon-juniper, oak, sagebrush, montane conifer, and wetlands, May-Jul.
- 1. Corolla 6-10 mm long, campanulate to tubular-funnelform . . . . . **S. oreophilus** Gray
  - 2. Stems erect, branches not tangled, leaves to 5 cm long . . . . . **var. utahensis** (Rydb.) A. Nelson  
(Mountain snowberry) Shrub, common in pinyon-juniper/oak/sagebrush and montane conifer. Jun-Aug.
  - 2. Stems decumbent and branched tangled; leaves to 2 cm long . . . . . **var. parishii** (Rydb.) Cronq.  
(Mountain snowberry) Shrub, uncom in pinyon-juniper/oak/sagebrush. Jun-Aug. Herbarium specimens may not be distinguishable from var. *utahensis*.

**Valeriana** (Valerian)

- 1. Corolla pink, 7-15 mm long and narrowly tubular, tube much longer than the lobes . . . . . **V. arizonica** Gray  
(Arizona valerian) PerForb, uncom in shady canyons in oak & montane conifer, May-Jun.
- 1. Corolla white, 2-4 mm long, corolla tube about equal to the lobes . . . . . **V. occidentalis** Heller  
(Western valerian) PerForb; Reported by Ott (2010), montane conifer, Jun-Jul.

**Caryophyllaceae** (Pink Family)

- 1. Sepals fused into a tubular calyx; petals abruptly narrowed to a slender base (claw) . . . . . **Silene**
- 1. Sepals distinct or nearly so; petals without claws
  - 2. Petals rounded and entire or slightly notched to ragged-toothed but not deeply cleft into 2 lobes
    - 3. Inflorescence an umbel; petals ragged-toothed; annual . . . . . **Holosteum**
    - 3. Inflorescence not an umbel, petals entire or slightly notched but not ragged-toothed; annual or perennial
      - 4. Leaves elliptic to lance-shaped, 2-5 mm wide; stems with rough, downward-pointed hairs, sometimes forming lines . . . . . **Arenaria**
      - 4. Leaves linear to filiform, usually less than 1 mm wide; stems glabrous or glandular but not with rough, downward-pointed hairs forming lines
        - 5. Plants annual; stems not woody at base; leaves not in a dense basal tuft . . . . . **Minuartia**
        - 5. Plants perennial; stems sometimes woody at the base or leaves in a dense basal tuft . . . . . **Eremogone**
  - 2. Petals deeply cleft into 2 lobes, plants often appearing to have 10 petals instead of 5
    - 6. Styles usually 5, capsule cylindrical, often 1-2 times longer than the calyx, dehiscent by 10 teeth . . . **Cerastium**
    - 6. Styles usually 3, capsule ovoid to short-cylindric, usually shorter than or equaling the calyx, dehiscent by 6 or 8 teeth
      - 7. Plants perennial; inflorescence densely glandular hairy; petals over twice as long as the sepals; stems without straight lines of hairs . . . . . **Pseudostellaria**
      - 7. Plants annual; inflorescence not glandular hairy; petals about equal to the sepals in length; stems with straight lines of hairs . . . . . **Stellaria**

**Arenaria** (Sandwort)

**A. lanuginosa** (Michx.) Rohrb. (Sprawling sandwort) PerForb, uncom in Ponderosa pine, May-Aug  
(*Spergulastrum lanuginosum*).

**Cerastium** (Chickweed)

**C. nutans** Raf. (Nodding chickweed) AnnForb, uncom in pinyon-juniper & wetlands, Apr-Aug.

**Eremogone** (Sandwort)

- 1. Inflorescence congested, ball-like . . . . .  
. . . . . **E. congesta** (Nutt. ex Torr. & Gray) **var. subcongesta** (Watson) Hartm. & Rabeler  
(Looseflower sandwort) PerForb, rare in pinyon-juniper, sagebrush, oak, & montane conifer, May-Aug  
(*Arenaria congesta* var. *subcongesta*).
- 1. Inflorescence open, multi-branched, not ball-like

2. Plants subshrubs, stems 13-45 cm tall, woody at least at the base; leaves mainly on the stem; inflorescence elongate and comprising 1/4 to 1/3 of plant height . . . . . ***E. macradenia*** (Wats.) Ikonn. (Shrubby sandwort) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Mar-Aug (*Arenaria macradenia*).
2. Plants herbaceous, stems 2-25 cm tall, seldom if ever woody at the base; leaves along stem and in a basal rosette; inflorescence proportionally shorter
3. Sepals mainly 3.3-4.5 mm long; usually purplish in the middle; inflorescence usually glandular . . . . . ***E. kingii*** (Wats.) Ikonn. **var. *glabrescens*** (Wats.) (Basin sandwort) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, May-Aug (*Arenaria fendleri* var. *glabrescens*).
3. Sepals often more than 4.5 mm long, green or purplish in the middle; inflorescence glabrous or glandular . . . . . ***E. eastwoodiae*** (Rydb.) Welsh (Eastwood's sandwort) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, May-Sep (*Arenaria fendleri* var. *eastwoodiae*).

***Holosteum*** (Holosteum)

***H. umbellatum*** (Holosteum) AnnForb, introduced from Europe, rare in disturbed areas, Apr-Jun.

***Minuartia*** (Sandwort)

***M. pusilla*** (Watson) Mattf. (Dwarf sandwort) AnnForb, uncom in sandy areas of pinyon-juniper & montane conifer, Apr-Jul (*Arenaria pusilla*).

***Pseudostellaria*** (Chickweed)

***P. jamesiana*** (Torr.) Weber & Hartm. (James' chickweed) PerForb, uncom in pinyon-juniper, oak, & montane conifer, Jun-Aug (*Stellaria jamesiana*).

***Silene*** (Campion)

1. Plants annual; stems with dark sticky bands. . . . . ***S. antirrhina*** L. (Sleepy catchfly) AnnForb, uncom in warm desert shrub, sagebrush, & pinyon-juniper, May-Aug.
1. Plants perennial; stems glandular, but without discrete dark sticky bands
  2. Styles 5; fruiting capsule opening by 10 teeth (*Lychnis*) . . . . . ***S. drummondii*** Hook. (Drummond's catchfly) PerForb, uncom in sagebrush, pinyon juniper, oak, & montane conifer, May-Sep (*Lychnis drummondii*, *Gastrolychnis drummondii*).
  2. Styles 3; fruiting capsule opening by 6 teeth
    3. Caudex branched with whitish internodes and stem bases; inflorescence branches erect to ascending . . . . . ***S. verecunda*** Wats. **ssp. *andersonii*** (Clokey) Hitchc. & Maguire (Shy campion) PerForb, uncom in pinyon-juniper, sagebrush, & oak.
    3. Caudex not branched, stems tufted, purplish at base; inflorescence branches often drooping . . . . . ***S. scouleri*** Hook. **ssp. *pringlei*** (Wats.) Hitchc. & Maguire (Scouler's campion) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Jul-Sep.

***Stellaria*** (Chickweed)

***S. media*** (L.) Vill. (Common chickweed) AnnForb, introduced from Eurasia, uncom in disturbed areas, Feb-Oct (*Alsine media*).

**Celastraceae** (Staff-tree Family)

Includes Parnassiaceae (formerly in Saxifragaceae)

1. Shrubs; flowers red; leaves spiny-toothed on margins . . . . . ***Paxistima***
1. Perennial forbs; flowers white; leaves entire . . . . . ***Parnassia***

***Parnassia*** (Grass-of-Parnassus, Parnassia)

***P. palustris*** L. **var. *montanensis*** (Fern. & Rydb.) C.L. Hitchc. (Marsh grass-of-Parnassus) PerForb, uncom in wetlands, May-Oct.

***Paxistima*** (Mountain-lover)

***P. myrsinites*** (Pursh) Raf. (Mountain-lover) Shrub, com in pinyon-juniper/oak & montane conifer, May-Aug (*Pachystima myrsinites*).

## Cleomaceae or Capparaceae (Caper Family)

### *Peritoma* (Beeplant, formerly *Cleome*)

1. Petals yellow; leaflets 5-7 . . . . . ***P. lutea*** (Hook.) Raf.  
(Yellow beeplant) AnnForb, uncom in sandy areas in warm desert shrub, sagebrush, pinyon-juniper/oak, & montane conifer, Apr-Sep (*Cleome lutea*).
1. Petals pink or purplish to white; leaflets 3 . . . . . ***P. serrulata*** (Pursh) DC.  
(Rocky Mountain beeplant) AnnForb, Reported from disturbed areas (Welsh 1995), May-Oct (*Cleome serrulata*).

## Commelinaceae (Spiderwort Family)

### *Tradescantia* (Spiderwort)

- T. occidentalis*** (Britt.) Smyth (Western spiderwort) PerForb, common in sandy soils in pinyon-juniper, oak, sagebrush, & montane conifer, May-Aug.

## Convolvulaceae (Morning Glory Family)

Includes Cuscutaceae

1. Plants parasitic and non-photosynthetic; stems soft, orange, yellow, or whitish; leaves absent or scale-like; flowers 1-4 mm long, corolla urn or bell-shaped with 4-5 lobes . . . . . ***Cuscuta***
1. Plants non-parasitic and photosynthetic; stems green, leaves present; flowers 15-60 mm long, corolla bell or trumpet-shaped with 5 lobes
  2. Corolla white or pink, 15-30 mm; calyx 3-5 mm long; leaves arrow-head shaped at base, 1.5-3.5 cm long . . . . . ***Convolvulus***
  2. Corolla blue or purple, 50-60 mm; calyx 12-16 mm long; leaves heart-shaped at base, 4-10 cm long . . . ***Ipomoea***

### *Convolvulus* (Bindweed)

- C. arvensis*** L. (Field bindweed) PerForb, uncom in disturbed areas, introduced from Eurasia, Jun-Aug.

### *Cuscuta* (Dodder)

1. Corolla lobes 1-1.5 mm long, upright to spreading, tips often curved inward, midrib nerved or bumpy-granular; fruiting capsule with a shallow raised dome at the tip; calyx often equaled by uppermost bracts . . . . . ***C. indecora*** Choisy  
(Plain dodder), AnnForb, uncom in disturbed areas of Parunuweap Canyon, Jul-Sep.
1. Corolla lobes to 1 mm long, spreading, tips not curved, midrib not nerved or bumpy-granular; fruiting capsule without a raised dome at the tip; calyx not subtended by bracts . . . . . ***C. pentagona*** Engelm.  
(Field dodder), AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Jul-Sep.

### *Ipomoea* (Morning glory)

- I. purpurea*** (L.) Roth. (Common morning glory) AnnForb, introduced from tropical America, uncom in disturbed areas and wetlands, Jul-Sep. Zion plants can have entire or 3-lobed leaves.

## Cornaceae (Dogwood Family)

### *Cornus* (Dogwood)

- C. sericea*** L. var. ***sericea*** (Red-osier dogwood) Shrub, uncom in wetlands. May-Jul (*C. stolonifera*).

## Crassulaceae (Stonecrop Family)

### *Sedum* (Stonecrop)

1. Leaves opposite or nearly so, long persistent; petals fused at base . . . . . ***S. debile*** Wats.  
(Weak-stemmed stonecrop) PerForb, uncom in montane conifer, Jun-Aug.
1. Leaves alternate, early deciduous; petals all separate . . . . . ***S. lanceolatum*** Torr.  
(Lance-leaved stonecrop) PerForb, uncom in pinyon-juniper, oak, sagebrush, & montane conifer, Jun-Aug.

**Crossosomataceae** (Greasebush Family)

**Glossopetalon** (Greasebush)

**G. spinescens** Gray var. **aridum** Jones (Nevada greasebush) Shrub, uncom in warm desert shrub & sagebrush, Mar-Jun. (*Forsellesia nevadensis*).

**Cucurbitaceae** (Squash Family)

**Cucurbita** (Gourd)

**C. foetidissima** H. B. K. (Buffalo gourd) PerForb, uncom in warm desert, pinyon-juniper, & sagebrush, May-Aug.

**Cupressaceae** (Cypress Family)

- 1. Cones berry-like, fleshy, blue, less than 12 mm thick ..... **Juniperus**
- 1. Cones woody, brown, over 15 mm thick ..... **Cupressus**

**Cupressus** (Cypress)

**C. arizonica** Greene (Arizona cypress) Tree, rare, cultivated, native to SW US (*Hesperocyparis arizonica*).

**Juniperus** (Juniper)

- 1. Leaves in whorls of 3, needle-like, usually whitened above ..... **J. communis** L. var. **depressa** Pursh (Common juniper) Shrub, uncom in montane conifer.
- 1. Leaves mostly opposite and scale-like, usually not whitened above
  - 2. Branchlets stout, mostly 1-2 mm thick, yellowish-green; leaves about as long as wide, their margins often minutely ciliate or toothed ..... **J. osteosperma** (Torr.) Little (Utah juniper) Abundant in pinyon-juniper woodlands.
  - 2. Branchlets slender and often drooping, mainly less than 1 mm thick, bluish-green; leaves mostly longer than wide, their margins entire ..... **J. scopulorum** Sarg. (Rocky Mountain juniper) Uncom in moist, shady canyon bottoms in oak, mountain conifer, & wetlands.

**Cyperaceae** (Sedge Family)

- 1. Achenes enclosed within a membranous sac (perigynium) as well as subtended by a scale; perianth bristles lacking; flowers unisexual ..... **Carex**
- 1. Achenes not enclosed within a membranous sac, but subtended by a scale and usually by perianth bristles; flowers perfect (some flowers unisexual in *Cladium*)
  - 2. Spikelet solitary at the tip of the stem, lacking a prolonged bract that resembles a leaf or the continuation of the stem ..... **Eleocharis**
  - 2. Spikelets several to many in a multi-branched terminal inflorescence or one to several at the base of a terminal bract that resembles a leaf or the continuation of the stem
    - 3. Annuals with stems 3-5 cm tall; achenes with a single tiny membranous scale; stamens usually 1 ..... **Lipocarpa**
    - 3. Perennials with stems over 15 cm tall; achenes with 1-6 slender bristles; stamens usually 3 (*Scirpus, sensu lato*)
      - 4. Inflorescence appearing lateral, involucrel bract solitary, leaf-like or appearing like a continuation of the stem ..... **Schoenoplectus**
      - 4. Inflorescence obviously terminal with 2 or more elongate, spreading, well-developed, leaf-like involucrel bracts
        - 5. Spikelets mostly 3-6 mm long, with over 100 in an open, umbel-like inflorescence ..... **Scirpus (sensu stricto)**
        - 5. Spikelets mostly 10-25 mm long, with 3-40 in a compact, sessile inflorescence or with a principal cluster surpassed by smaller clusters ..... **Bolboschoenus**

**Bolboschoenus** (Tuberous bulrush)

**B. maritimus** (L.) Palla in Koch (Alkali bulrush) PerGram, rare in wetlands, Jun-Sep (*Scirpus maritimus*).

**Carex** (Sedge)

1. Spikes solitary at tip of stem or closely aggregated into a single elongate or ovoid head; plants dioecious (with separate staminate and pistillate plants)
  2. Inflorescence ovoid, 1.5-5.5 cm long, comprised of 2 or more closely aggregated spikes; perigynia (if present) glabrous, 2.2-4.7 mm long with a beak 1-1.5 mm long; stigmas 2; stems on elongate rhizomes . . . . . **C. douglasii** F. Boott (Douglas' sedge) PerGram, uncom in sagebrush, pinyon-juniper, & montane conifer, Apr-Aug.
  2. Inflorescence narrowly cylindric, consisting of a single spike, staminate spikes 2.5-3.5 cm long, pistillate spikes 3-4.5 cm long; perigynia (if present) pubescent, 4.5-5.5 mm long with a beak less than 0.8 mm long; stigmas 3; stems clump-forming . . . . . **C. haysii** Welsh (Hays' sedge) PerGram, uncom in wetlands, May-Jul, type locality is Zion Canyon.
1. Spikes more than one per stem, if densely clustered individual spikes can still be recognized; plants not dioecious (staminate and pistillate flowers on the same plant)
  3. Stigmas 3; achenes 3-sided (trigonus)
    4. Perigynia spreading, giving the spike a bristly appearance; perigynia glabrous, 5-7 mm long with a beak 2 mm or more long; pistillate scales with an elongate, roughened awn tip 2-6 mm long . . . . . **C. hystericina** Muhl. ex Willd. (Bottlebrush sedge) PerGram, uncom in wetlands, May-Jun.
    4. Perigynia erect, pubescent, 3.3-5 mm long with a beak 0.8-1.8 mm long; pistillate scales acute but not elongated into roughened awn tip
      5. Pistillate spikes with 1-4 perigynia; flowering stems of two types, with some 1-5 cm high and embedded among the basal leaves and others 5-30 cm high and equaling or longer than the basal leaves; perigynia tapered at the base . . . . . **C. rossii** F. Boott (Ross' sedge) PerGram, uncom in pinyon-juniper, oak, sagebrush, & montane conifer, May-Aug.
      5. Pistillate spikes with 5 or more perigynia; flowering stems all alike in stature; perigynia round at the base . . . . . **C. pellita** Willd. (Woolly sedge) PerGram, uncom in wetlands, May-Sep (*C. lanuginosa*).
  3. Stigmas mostly 2 (rarely a few flowers have 3); achenes 2-sided (lens-shaped)
    6. Lateral spikes peduncled, or if sessile then elongate; terminal spikes usually all staminate
      7. Scales pale green; perigynia beakless, often turning yellowish or golden at maturity . . . . . **C. aurea** Nutt. (Golden sedge) PerGram, uncom in wetlands, Apr-Aug (*C. garberi*).
      7. Scales dark brown or black with a green midstripe; perigynia short-beaked, brownish or straw-colored at maturity . . . . . **C. nebrascensis** Dewey (Nebraska sedge) PerGram, uncom in wetlands, May-Jul.
    6. Lateral spikes sessile or nearly so, usually not much longer than wide; terminal spikes usually with both staminate and pistillate flowers
      8. Spikes with staminate flowers located above the pistillate flowers
        9. Stems occur singly or in small clumps along an elongate rhizome; bases dark brown or blackish . . . . . **C. praegracilis** W. Boott (Blackcreeper sedge) PerGram, uncom in wetlands, May-Aug.
        9. Stems densely tufted, rhizomes lacking or very short; bases green, tan, or brownish
          10. Inflorescence of more than 10 spikes; leaf sheaths red-spotted . . . . . **C. alma** L.H. Bailey (Alma sedge) PerGram, rare in wetlands, Jun-Sep.
          10. Inflorescence of fewer than 10 spikes; leaf sheaths not red-spotted
            11. Body of perigynium smooth, abruptly contracted to the beak; beak more deeply cut on one side . . . . . **C. vallicola** Dewey (Valley sedge) PerGram, uncom in pinyon-juniper, oak, & montane conifer, May-Jul.
            11. Body of perigynium finely serrated, gradually tapering to the beak, beak equally toothed on both sides . . . . . **C. occidentalis** L.H. Bailey (Western sedge) PerGram, uncom in montane conifer, Jun-Aug.
    8. Spikes with pistillate flowers located above the staminate flowers
      12. Lowest bract subtending the inflorescence elongate, leafy, usually equaling or surpassing the entire inflorescence . . . . . **C. athrostachya** Olney (Slender-beaked sedge) PerGram, uncom in wetlands, May-Aug.
      12. Lowest bract subtending the inflorescence inconspicuous and short, not equaling or surpassing the entire inflorescence
        13. Perigynia 2.7-5 mm long; slender-beaked, essentially wingless
          14. Perigynia 2.7-3.5 mm long, 1-1.5 mm wide; pistillate scales reddish-brown; usually in dry habitats . . . . . **C. subfusca** W. Boott (Rusty sedge) PerGram, uncom in montane conifer, Jun-Aug.

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14. Perigynia 3.2-5 mm long, 1.3-2.2 mm wide; pistillate scales brown; usually in wet habitats . . .  
..... **C. microptera** Mack.  
(Small-wing sedge) PerGram, uncom in wetlands, Jun-Aug.
13. Perigynia 4-7 mm long; beak triangular, broadly winged
15. Pistillate scales about as wide and long as the perigynia; inflorescence elongate, individual spikes not clustered . . . . . **C. tahoensis** Smiley  
(Dryland sedge) PerGram, uncom in montane conifer, Jul-Aug (*C. xerantica*).
15. Pistillate scales shorter and narrower than perigynia; inflorescence head-like, spikes often clustered . . .  
..... **C. scoparia** Schkuhr ex Willd.  
(Broom sedge) PerGram, rare in montane conifer & wetlands, Jun-Aug.

**Eleocharis** (Spikerush)

1. Stigmas 2; achenes 2-sided (lens-shaped) . . . . . **E. palustris** (L.) Roem. & Schultes  
(Common spikerush) PerGram, uncom in wetlands, May-Aug.
1. Stigmas 3; achenes 3-sided (trigonus)
  2. Stems clustered, some stems arching and rooting at the tips from a vegetative bulbil (in place of a normal flower spike); tubercle on summit of achene not forming a distinct cap . . . . . **E. rostellata** (Torr.) Torr.  
(Torrey's spikerush) PerGram, uncom in wetland areas, Jul-Sep.
  2. Stems clumped or borne along an elongate rhizome, not forming vegetative bulbils in place of normal flower spikes; tubercle on summit of achene forming a distinct cap
  3. Tubercle cap of achene widest at base (nearly as wide as the achene) and tapering to a narrow tip . . . . .  
..... **E. bolanderi** Gray  
(Bolander's spikerush) PerGram, uncom in wetlands, May-Jul.
  3. Tubercle cap of achene much narrower than achene, triangular . . . . . **E. parishii** Britt.  
(Parish's spikerush) PerGram, uncom in wetlands, Apr-Sep.

**Lipocarpha** (Slender rush)

**L. aristulata** (Cov.) Tucker (Slender-rush) AnnGram, rare, known only from seed grown from the Virgin River below Zion Narrows (*Hemicarpha drummondii*, *H. micrantha*, *Lipocarpha drummondii*).

**Schoenoplectus** (Bulrush)

1. Inflorescence headlike, with 3-15 sessile spikelets in a sessile cluster; stems round to triangular . . . . .  
..... **S. pungens** (Vahl) Palla  
(Three-square bulrush) PerGram, uncom in wetlands, May-Aug (*Scirpus pungens* var. *longispicatus*).
1. Inflorescence open and conspicuously branched with more than 20 spikelets, these either short-stalked or in sessile clusters that are stalked; stems round
  2. Scales of the spikelets orangish to reddish-brown; scales with short reddish stripes, mostly 2-3 (3.5) mm long . . .  
..... **S. tabernaemontani** (Gmel.) Palla  
(Soft-stem bulrush) PerGram, uncom in wetlands, Jun-Aug (*Scirpus validus*).
  2. Scales of the spikelets grayish-brown with prominent red stripes, mostly 3.5-4 mm long . . . . .  
..... **S. acutus** (Muhl. ex Bigelow) Löve & Löve var. **occidentalis** (Watson) Smith  
(Hardstem bulrush) PerGram, uncom in wetland areas, Jun-Aug, (*Scirpus acutus*).

**Scirpus** (Bulrush)

**S. microcarpus** Presl & Presl (Panicked bulrush) PerGram, uncom in wetlands, Jun-Aug.

**Dennstaedtiaceae** (Bracken fern Family)

**Pteridium** (Bracken fern)

**P. aquilinum** (L.) Kuhn var. **pubescens** Underwood (Bracken fern) Fern, uncom in pinyon-juniper, oak, & montane conifer.

**Dipsacaceae** (Teasel Family)

**Dipsacus** (Teasel)

**D. sylvestris** Hudson (Teasel) PerForb, rare, introduced, from Europe, found in disturbed areas, Jul-Sep.



## Dryopteridaceae (Wood-fern Family)

Includes Cystopteridaceae, Woodsiaaceae

1. Indusium shield-like or kidney-shaped
2. Sporangia occur in a complete ring around a centrally-located, round and shield-like indusium; leaflets 0.8-3.2 cm long, margins saw-toothed . . . . . **Polystichum**
2. Sporangia in a broken ring surrounding 4/5 of the kidney-shaped indusium; leaflets to 15 cm long, margins bluntly lobed or toothed . . . . . **Dryopteris**
1. Indusium cup-shaped, hood-like, star-like, or appearing absent
3. Leaves scattered along the rhizome; leaf stalks deciduous and not forming a tuft; indusium cup-shaped early in season, becoming withered with age; bulblets present or absent on upper portion of frond . . . . . **Cystopteris**
3. Leaves tufted; leaf stalks long persistent, forming a thatch; indusium split into star-like branches or soon withering and appearing absent; bulblets lacking . . . . . **Woodsia**

### **Cystopteris** (Bladder fern, Brittle fern)

1. Leaves usually glandular on the veins, midrib, or indusium; leaf blades widest at the base; bulblets often present
2. Bulblets usually present; leaf blades long attenuate at tip, up to 75 cm long; gland-tipped hairs usually lacking in axils of leaflets . . . . . **C. bulbifera** (L.) Bernh. (Bulblet bladder fern) Fern, uncom in rock crevices
2. Bulblets lacking or misshapen; leaf blades short attenuate at tip, to 40 cm long; gland-tipped hairs usually present in axils of leaflets . . . . . **C. utahensis** Windham & Haufler (Utah bladder fern) Fern, uncom in shady rock crevices; of hybrid origin between *C. bulbifera* and *C. reevesiana*; included in *C. fragilis* by Welsh et al. (2008) and Fertig and Alexander (2009).
1. Leaves not glandular; leaf blades widest just above the base; bulblets not present (*C. fragilis* in sense of Welsh et al. 2008)
3. Leaf blades 1-2 times pinnately divided, main leaflets diverging from the rachis at an acute angle and curving upward; lowest pinnules of leaflet sessile . . . . . **C. tenuis** (Michx.) Desvaux (Mackay's brittle fern) Fern, uncom in rock crevices and wetlands.
3. Leaf blades 2-3 times pinnately divided, main leaflets diverging from the rachis at a right angle and spreading; lowest pinnules of leaflet short-stalked . . . . . **C. reevesiana** Lellinger (Southwestern brittle fern) Fern, uncom in rock crevices and wetlands

### **Dryopteris** (Wood fern)

**D. filix-mas** (L.) Schott. (Male fern) Fern, uncom in rock crevices.

### **Polystichum** (Holly-fern)

**P. scopulinum** (D.C. Eaton) Maxon (Rock holly-fern) Fern, uncom in rock crevices.

### **Woodsia** (Woodsia)

**W. oregana** D.C. Eaton (Oregon woodsia) Fern, rare in rock crevices.

## Elaeagnaceae (Oleaster Family)

1. Leaves alternate; flowers perfect or polygamous; stamens 4 . . . . . **Elaeagnus**
1. Leaves opposite; flowers usually perfect; stamens 8 . . . . . **Shepherdia**

### **Elaeagnus** (Oleaster, Russian-olive)

**E. angustifolia** L. (Russian olive) Tree, uncom in wetland and disturbed areas, introduced from Eurasia, May-Jul.

### **Shepherdia** (Buffaloberry)

**S. rotundifolia** Parry (Roundleaf buffaloberry) Shrub, uncom in warm desert shrub, & pinyon-juniper, Mar-May.

## Ephedraceae (Ephedra Family)

### **Ephedra** (Mormon tea)

1. Leaves and bracts 3 per node; branches whorled . . . . . **E. torreyana** S. Wats. (Torrey's mormon tea) Shrub, uncom in warm desert areas on clay soils.
1. Leaves and bracts 2 per node; branches opposite

2. Branches grayish-green, widely spreading; bases of mature scale leaves gray or light brown, deciduous . . . . . ***E. nevadensis*** S. Wats.  
(Nevada mormon tea) Shrub, uncom in warm desert areas.
2. Branches yellowish-green, erect in broom-like clusters; bases of mature scale leaves dark brown, persisting . . . . . ***E. viridis*** Coville
3. Pistillate (female) cones sessile or on short stalks (shorter than the cone); stems not sticky, erect shrubs, not sprawling or grass-like and buried in dunes . . . . . **var. *viridis***  
(Green mormon tea) Shrub, common in warm desert, sagebrush & pinyon-juniper.
3. Pistillate cones on long stalks (usually equal or longer than the cone); stems often sticky; erect shrubs or often sprawling over ground, sometimes buried in sand and branches grass-like . . . **var. *viscida*** (Cutler) L. Benson  
(Cutler's mormon tea) Shrub, uncom (*E. cutleri*).

## **Equisetaceae** (Horsetail Family)

### ***Equisetum*** (Horsetail, Scouring rush)

1. Stems annual, typically of two types, the fertile stems pale and fleshy (without chlorophyll), the sterile stems commonly with regular whorls of branches; cones rounded at tip . . . . . ***E. arvense*** L.  
(Field horsetail) Fern, uncom in sagebrush, montane conifer, & wetlands.
1. Stems perennial or annual, all alike, typically unbranched, or if so lacking regular whorls of branches (branches arising from injury to stem); cones rounded or pointed at tip
  2. Stems slender, 1-2.5 mm thick, less than 25 cm tall, with 5-12 vertical ridges; nodes with a sheath of short, persistent black teeth with white margins
    3. Vertical stem ridges each with a median furrow running the full length of the ridge . . . . . ***E. variegatum*** Schleich. ex Weber & Mohr  
(Northern scouring-rush) Fern, rare in wetlands.
    3. Vertical stem ridges without a median furrow running their full length . . . . . ***E. x nelsonii*** (A.A. Eat.) Schaffn.  
(Nelson's scouring-rush) Fern, rare in wetlands. Hybrid between *E. laevigatum* x *E. variegatum*.
  2. Stems robust, 3-14 mm thick, 20-150 cm tall, with 16-40 vertical ridges; node sheaths typically with or without teeth (if present, teeth are often deciduous
    4. Stem sheaths longer than broad, green with a single dark band; cones rounded at tip . . . ***E. laevigatum*** A. Br.  
(Smooth scouring-rush) Fern, uncom in wetlands.
    4. Stem sheaths about as broad as long, green or gray in center and with 1- 2 dark bands; cones pointed at tip
      5. Stem sheaths gray in center with 2 dark bands; stems perennial . . . . . ***E. hyemale*** L. **var. *affine*** (Engelm.) Eaton  
(Tall scouring-rush) Fern, uncom in wetlands.
      5. Stem sheaths green or gray with a single dark band; stems annual or short-lived; intermediate in characters between *E. laevigatum* and *E. hyemale* . . . . . ***Equisetum x ferrisii*** Clute  
(Ferris' scouring-rush) Fern, rare in wetlands. Hybrid between *E. hyemale* x *E. laevigatum*.

## **Ericaceae** (Heath Family)

Includes Monotropaceae and Pyrolaceae

1. Forbs without chlorophyll, leaves pink to reddish, never green; flowers urn-shaped, cream-colored to reddish (Monotropaceae) . . . . . ***Pterospora***
1. Woody shrubs, subshrubs (woody only at the base), or perennial forbs with chlorophyll; leaves green; flowers urn or saucer-shaped, white to pink
  2. Shrubs; leaves with entire margins; petals fused, flowers urn-shaped; fruit a red to orange berry-like drupe (Ericaceae, *sensu stricto*) . . . . . ***Arctostaphylos***
  2. Perennial herbs or subshrubs; leaves with toothed margins; petals all separate, flowers saucer-shaped; fruit a dry capsule (Pyrolaceae) . . . . . ***Chimaphila***

### ***Arctostaphylos*** (Manzanita)

1. Twigs and axis of inflorescence white-puberulent, not glandular . . . . . ***A. pungens*** Kunth  
(Mexican manzanita) Shrub, common in pinyon-juniper & sagebrush, Feb-Jun.
1. Twigs and axis of inflorescence glandular to glandular-puberulent . . . . . ***A. patula*** Greene  
(Greenleaf manzanita) Shrub, common in sandy pinyon-juniper/oak, sagebrush, & montane conifer, Mar-Jul.

### ***Chimaphila*** (Wintergreen)

1. Flowers white, 1-3 per stem; leaves lance-shaped to ovate . . . . . ***C. menziesii*** (R. Br. ex D. Don) Spreng.  
(Menzies' wintergreen) PerForb, uncom in canyons in montane conifer, May-Aug.

1. Flowers pink, 3-7 per stem; leaves oblanceolate ..... **C. umbellata** (L.) Barton  
(Pipsissewa) PerForb, Reported (Ott 2010), montane conifer, Jun-Sep.

**Pterospora** (Pinedrops)

- P. andromeda** Nutt. (Pinedrops) PerForb, rare in pinyon-juniper, oak, & montane conifer, Jun-Sep.

**Euphorbiaceae** (Spurge Family)

1. Plants bleed milky sap when stems or leaves are broken; flowers borne in a cup-like cyathium, lacking a perianth (but sometimes with a white or yellowish perianth-like rim); leaves alternate or opposite
2. Leaves (at least the lowermost), alternate, symmetrical at base ..... **Euphorbia**
2. Leaves all opposite, symmetrical or asymmetrical at base ..... **Chamaesyce**
1. Plants not bleeding milky sap when stems or leaves broken; flowers with a perianth (often minute), not borne in a cup-like cyathium; leaves alternate
3. Leaves with toothed margins; pubescence of long, simple, stinging hairs ..... **Tragia**
3. Leaves with entire margins; pubescence of appressed, star-shaped hairs ..... **Croton**

**Chamaesyce** (Spurge)

1. Plants perennial; cyathia (flower-like involucre) with a white rim
2. Stipules separate, slender, to 1 mm long; white rim of cyathium narrow or inconspicuous ..... **C. fendleri** (Torr. & Gray) Small  
(Fendler's spurge) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, May-Sep (*Euphorbia fendleri*).
2. Stipules united to form a prominent, white, fringed or erose interpetiolar scale about 1 mm long; white rim of cyathium 1-1.5 mm wide, prominent ..... **C. albomarginata** (Torr. & Gray) Small  
(Rattlesnake-weed) PerForb, uncom in warm desert, sagebrush, & pinyon-juniper, Apr-Sep (*Euphorbia albomarginata*).
1. Plants annual; cyathia without an obvious white rim
3. Leaves linear, petiole not distinct from blade; stems erect ..... **C. parryi** (Engelm.) Rydb.  
(Parry's spurge) AnnForb, uncom in sandy areas in warm desert, sagebrush, pinyon-juniper, & oak, May-Sep (*Euphorbia parryi*).
3. Leaves elliptic to ovate with an obvious petiole; stems prostrate
4. Leaves hairy ..... **C. maculata** (L.) Small  
(Spotted spurge) AnnForb, uncom in disturbed areas; introduced from eastern North America (*Euphorbia maculata*).
4. Leaves glabrous ..... **C. glyptosperma** (Engelm.) Small  
(Ridge-seeded spurge) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Jun-Aug (*Euphorbia glyptosperma*).

**Croton** (Croton)

- C. californicus** Muell.-Arg. in DC. (Mohave croton) AnnForb, Historic in sandy areas in warm desert, sagebrush, & pinyon-juniper, Apr-Aug.

**Euphorbia** (Spurge)

1. Plants perennial with multiple stems; lower leaves broadest at base, 0.7-2.5 cm long ..... **E. brachycera** Engelm. in Emory  
(Shorthorn spurge) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, May-Jun
1. Plants annual, usually with a simple stem below the inflorescence; lower leaves broadest at tip, 1-4 cm long ..... **E. spathulata** Lam.  
(Prairie spurge) AnnForb; uncom in warm desert, pinyon-juniper, sagebrush, & montane conifer, May-Jun.

**Tragia** (Noseburn)

- T. ramosa** Torr. (Noseburn), PerForb, rare in rocky warm desert & pinyon-juniper zone, May-Aug.

**Fabaceae or Leguminosae (Pea Family)**

1. Plants woody trees or shrubs
  2. Leaves uniformly bipinnately compound and consisting of two leaflets (attached at the same point of the leafstalk to form a V shape); stems with a pair of stout spines at each node; flowers regular (not pea-like with a distinct banner, wings, and keel) with exserted stamens, arranged in an elongate, bottle-brush-like inflorescence . . . . . **Prosopis**
  2. Leaves once pinnately compound or if bipinnate then consisting of 4-7 pairs of leaflets; stems with or without spines at the nodes; flowers mostly pea-like with a distinct banner, wings, and keel and stamens included within the keel (petals essentially equal in *Gleditsia* and not differentiated into banner, wings, and keel), flowers arranged in an open raceme or spike
  3. Leaves of two types, largest are bipinnately compound with 4-7 pairs of leaflets, smaller leaves are once-pinnately compound; flowers not pea-like, petals essentially equal, greenish-white or yellow; fruits flattened pods 7-35 cm long . . . . . **Gleditsia**
  3. Leaves uniformly once-pinnately compound; flowers pea-like with distinct banner, wings, and keel, petals white, yellow, pink, or purple; fruits rounded, inflated, or pod-like, shorter than 12 cm long
  4. Stems and leaves with embedded, dot-like glands; petals purple . . . . . **Psorothamnus**
  4. Stems and leaves without embedded, dot-like glands; petals white, pink, or yellow
  5. Shrubs without thorns; flowers yellow throughout; pods bladderly-inflated . . . . . **Colutea**
  5. Trees with prominent thorns; flowers white or pink; pods flat . . . . . **Robinia**
1. Plants herbaceous perennials or annuals
  6. Leaves with 3 leaflets
    7. Leaflets all attached at the same point (palmate), the terminal leaflet without its own separate stalk
    8. Leaflets sessile or nearly so . . . . . **Lotus**
    8. Leaflets petiolate
      9. Flowers golden-yellow; stamen filaments all separate (monadelphous) . . . . . **Thermopsis**
      9. Flowers cream, white, pink, purple, or blue; stamen filaments united at base to form two sets (diadelphous)
        10. Leaflets toothed, green, glabrous or sparsely pubescent; flowers clustered in terminal heads . . . . . **Trifolium**
        10. Leaflets entire, usually silvery-pubescent; flowers not in heads . . . . . **Astragalus**
    7. Leaves pinnate, the terminal leaflet jointed or stalked
      11. Stems and leaves glandular punctuate
        12. Plants caulescent, with 5 or more developed internodes . . . . . **Psoralidium**
        12. Plants acaulescent or nearly so, with fewer than 5 developed internodes . . . . . **Pedimelum**
      11. Stems and leaves not glandular punctuate
        13. Leaflets entire . . . . . **Lotus**
        13. Leaflets toothed
          14. Fruits curved or coiled; inflorescence a tight raceme or head not over 5 cm long; leaflets usually toothed only above the middle . . . . . **Medicago**
          14. Fruits straight; inflorescence a loose raceme usually over 5 cm long; leaflets usually toothed to below middle . . . . . **Melilotus**
  6. Leaves with 4 or more leaflets
    15. Leaves palmately compound
      16. Leaflets sessile . . . . . **Lotus**
      16. Leaflets petiolate
        17. Leaflets usually 7-11; herbage not glandular-dotted; stamen filaments all separate; pods several-seeded . . . . . **Lupinus**
        17. Leaflets usually 5; herbage glandular-dotted; stamen filaments united at base to form two sets (diadelphous); pods 1-seeded
          18. Plants caulescent, with 5 or more developed internodes . . . . . **Psoralidium**
          18. Plants acaulescent or nearly so, with fewer than 5 developed internodes . . . . . **Pedimelum**
    15. Leaves pinnately compound
      19. Herbage glandular-dotted
        20. Flowers pink, in spike-like racemes; pods 1-seeded, not bearing hooked appendages; stamens 5 . . . . . **Dalea**
        20. Flowers white, racemes not spike-like; pods several seeded and bearing hooked appendages; stamens 10 . . . . . **Glycyrrhiza**
      19. Herbage not glandular-dotted
        21. Terminal leaflet modified into a tendril or bristle-like structure; plants often viney
          22. Styles cylindrical, with a ring of hairs just under the stigma . . . . . **Vicia**
          22. Styles flattened, at least the upper 1/4 hairy along one side . . . . . **Lathyrus**
        21. Terminal leaflet not modified into a tendril or bristle-like structure; plants not viney

- 23. Flowers bright yellow or suffused with red, either solitary in leaf axils or 1-3 on long, axillary peduncles; leaflets either not all paired or minutely alternate along the rachis . . . . . **Lotus**
- 23. Flowers white, creamy yellow, pink, or purple, in axillary or terminal racemes; leaflets typically all paired (except for the odd, terminal leaflet)
- 24. Stipules spiny . . . . . **Peteria**
- 24. Stipules not spiny . . . . . **Astragalus**

**Astragalus** (Milkvetch or Locoweed)

- 1. Stems lacking (except for leafless flowering or fruiting stalks) or internodes very short, with stems not or barely exceeding the basal cluster of leaves
- 2. Flowers 9-12 mm long; calyx 5-6 mm long; fruit pods papery, inflated, elliptic, and mottled with purplish spots; stems often buried in sand . . . . . **A. striatiflorus** Jones (Escarpment milkvetch) PerForb, Historic, on sandy soil and Navajo slickrock, May-Jun & Sep, type locality from "Springdale", but may have actually come from western Kane County, UT, outside of Zion (Welsh et al. 2008).
- 2. Flowers 15-32 mm long; calyx 8-20 mm long; fruit pods papery or fleshy; stems usually not buried in sand
- 3. Leaf hairs minutely T-shaped (attached to the leaf surface at the center with 2 free arms)
- 4. Mature fruit pods crescent-shaped, green, mottled, or brownish, thinly pubescent, 20-40 cm long . . . . . **A. amphioxys** Gray var. **amphioxys** (Crescent milkvetch) PerForb, uncom in warm desert, sagebrush, & pinyon-juniper, Mar-Jun.
- 4. Mature fruit pods lance-shaped to ovoid, sometimes slightly curved, densely shaggy-pubescent, 15-25 mm long . . . . . **A. concordius** Welsh (Hairy-pod milkvetch) PerForb, uncom in pinyon-juniper & montane conifer, May-Jun (formerly included in *A. piutensis*). Type locality from vicinity of New Harmony, west of Kolob region of Zion NP.
- 3. Leaf hairs attached at the base, not T-shaped
- 5. Mature fruiting pods thinly pubescent and mottled or silvery-hairy but not woolly or shaggy, surface of fruit usually visible
- 6. Flowers 18-25 mm long; fruits mottled red . . . . . **A. zionis** Jones var. **zionis** (Zion milkvetch) PerForb, common in warm desert, sagebrush, pinyon-juniper, oak, montane conifer, & wetlands, Apr-Jun.
- 6. Flowers 15-17.5 mm long; fruits not mottled red . . . . . **A. argophyllus** Nutt. ex Torr. & Gray var. **panguicensis** (Jones) Jones (Panguitch milkvetch) PerForb, uncom in pinyon-juniper, oak, & montane conifer, May-Jul.
- 5. Mature fruiting pods densely woolly or shaggy with long, spreading hairs that obscure the surface of the fruit
- 7. Leaves with 19-31 leaflets, pubescence of long, twisted, spreading hairs . . . . . **A. mollissimus** Torr. var. **thompsoniae** (Wats.) Barneby (Woolly milkvetch) PerForb, uncom in sandy soils in warm desert, sagebrush, & pinyon-juniper, Feb-Jun.
- 7. Leaves with 5-17 leaflets, pubescence of short, smooth, appressed hairs
- 8. Top of root crown covered by thatch of persistent leaf stalks . . . . . **A. newberryi** Gray var. **newberryi** (Newberry's milkvetch) PerForb, uncom in warm desert, sagebrush, & pinyon-juniper, Mar-Jul.
- 8. Top of root crown not covered by thatch of persistent leaf stalks . . . . . **A. piutensis** Barneby & Mabberley (Sevier milkvetch) PerForb, Reported by Welsh (1995), pinyon-juniper & montane conifer, Apr-Jun. Zion reports may be based on specimens now referred to as *A. concordius*.
- 1. Stems elongate with obvious internodes, either erect or sprawling over the ground, much longer than the basal cluster of leaves
- 9. Leaflets all narrowly linear and widely spaced, terminal leaflet not narrowed at the base where attached to the main axis of the leaf (appearing as a continuation of the axis)
- 10. Leaf hairs minutely T-shaped (attached to the leaf surface at the center with 2 free arms); fruit pods inflated and balloon-like, mottled with red or purple, and tapering to a stalk-like base (in addition to the actual fruitstalk) . . . . . **A. ceramicus** Sheldon var. **ceramicus** (Painted milkvetch) PerForb, uncom in sandy warm desert, sagebrush, & pinyon-juniper, Apr-Jun.
- 10. Leaf hairs attached at the base, not T-shaped; fruit pods flat, narrowly oblong to elliptic, green or purplish but not mottled, not tapering to a stalk-like base
- 11. Flowers pink-purple or purplish-tinged; pods 20-35 mm long x 5-9 mm wide; stipules not fused . . . . . **A. lancearius** Gray (Lancer milkvetch) PerForb, uncom in warm desert & pinyon-juniper, Apr-Jun (*A. episcopus* var. *lancearius*).
- 11. Flowers yellowish white or tinged with purple; pods 13-25 mm long x 3-4 mm wide; lower stipules fused into a tube . . . . . **A. convallarius** Greene var. **finitimus** Barneby (Enterprise milkvetch) PerForb, rare in warm desert & pinyon-juniper, Apr-May.

9. Leaflets broader, lance-shaped to elliptic or oval (often narrowly linear in *A. flavus*), not widely spaced, terminal leaflet distinctly narrowed at point of attachment to the main axis of the leaf (not appearing as a continuation of the axis)
12. Plants annual; flowers 4-7.5 mm long; tip of keel sharp-pointed ..... ***A. nuttallianus*** A. DC. **var. *imperfectus*** (Rydb.) Barneby (Coliche milkvetch) AnnForb, uncom in warm desert, Apr-Jun
12. Plants perennial; flowers 7.5 -28 mm long (as small as 6 mm in *A. subcinereus*); tip of keel blunt
13. Leaf hairs minutely T-shaped (attached to the leaf surface at the center with 2 free arms)
14. Flowers pink or purple; calyx 9.5-14 mm long; fruit pods spreading, crescent-shaped, 20-40 mm long, and often mottled with red or purple ..... shade forms of ***A. amphioxys*** Gray **var. *amphioxys*** (see lead 4 above for more details)
14. Flowers white or creamy; calyx 5.5-9.5 mm long; fruit pods erect, oblong, 7-13 mm long, and not mottled . . . . . ***A. flavus*** Nutt. ex Torr. & Gray **var. *higginsii*** Welsh (Higgins' milkvetch) PerForb, locally common in Chinle soils of warm deserts, Mar-May; fresh flowers smell like grape popsicles (compared to the selenium stench of var. *flavus*).
13. Leaf hairs attached at the base, not T-shaped; sometimes nearly glabrous on the surface
15. Flowers pink or purple, sometimes with whitish tips; fruits usually sessile and not inflated (with exception of *A. ampullarius* with long-stalked base of fruit)
16. Fruits brightly red-spotted; leaflets ovate to elliptic, with acute tips ..... ***A. zionis*** Jones **var. *zionis*** (see couplet 6)
16. Fruit not red-spotted; leaflets broadly ovate with blunt or indented tips
17. Fruits with a long stalk at the base, glabrous, inflated, erect; stipules of lower leaves fused into a sheath . . . . . ***A. ampullarius*** Watson (Gumbo milkvetch) PerForb, rare in Chinle clays in warm desert, Apr-May
17. Fruits sessile at base (short-stalked in *A. ensiformis*, but stalk hidden within calyx), usually thinly pubescent (often glabrous in *A. lentiginosus*), not strongly inflated, drooping, spreading, or erect in *A. cibarius*; stipules of all leaves separate
18. Inflorescences headlike, of 4-15 flowers ..... ***A. cibarius*** Sheldon (Browse milkvetch) PerForb, uncom in warm desert, pinyon-juniper, & oak, Apr-Jul.
18. Inflorescences elongated, of 10-30 flowers
19. Stems erect; flowers mostly pink-purple throughout; pod sessile, triangular in cross-section or flattened from the top and bottom . . . ***A. lentiginosus*** Dougl. ex Hook. **var. *palans*** (Jones) Jones (Stragglng milkvetch) PerForb, uncom in warm desert, sagebrush, & pinyon-juniper, Apr-Jun.
19. Stems spreading along ground or weakly erect; flowers pink-purple with whitish tips; pod with a small stalk, hidden by the persistent calyx, round in cross-section or flattened from the sides ..... ***A. ensiformis*** Jones (Pagumpa milkvetch) PerForb, uncom in warm desert & pinyon-juniper, Apr-Jun.
15. Flowers yellowish-white, sometimes with a purple-tipped keel; fruits often stalked or inflated
20. Flowers 6-9 mm long; fruit pods sessile; stems mostly prostrate ..... ***A. subcinereus*** Gray **var. *silerianus*** (Jones) Welsh (Siler's milkvetch) PerForb, uncom in pinyon-juniper, oak, & montane conifer, May-Jul.
20. Flowers 10-24 mm long; fruit pods stalked, or if sessile then stems erect
21. Fruiting pods sessile, oval to globe-shaped, pubescent with spreading hairs, turning dark brown or black at maturity ..... ***A. cicer*** L. (Chickpea milkvetch) PerForb, introduced from Europe, uncom in disturbed areas, pinyon-juniper, & montane conifer, Apr-Jul.
21. Fruiting pods stalked at the base ovoid to elliptic, glabrous or with fine, appressed hairs, typically green, straw-colored, or mottled at maturity
22. Stipules of lower leaves fused into a sheath; fruits elliptic, drooping, strongly two-grooved on lower surface ..... ***A. bisulcatus*** (Hook.) Gray **var. *major*** (Jones) Welsh (Johnson milkvetch) PerForb, rare in warm desert, sagebrush, pinyon-juniper, & oak, May-Aug.
22. Stipules of all leaves separate; fruits ovoid to elliptic, erect to spreading or drooping, without two grooves on lower surface
23. Stems spreading over ground; pods mottled, 25-55 mm long, mostly spreading to drooping ..... ***A. oophorus*** Wats. **var. *caulescens*** (Jones) Jones (Egg milkvetch) PerForb, uncom in pinyon-juniper, May-Jul.
23. Stems erect; pods green to straw-colored, not mottled (sometimes spotted in *A. praelongus*), 12-38 mm long, mostly erect to spreading
24. Calyx 6-13 mm long; fruits spreading, 18-38 mm long; plants strongly smelling of selenium ..... ***A. praelongus*** Sheldon **var. *praelongus*** (Stinking milkvetch) PerForb, uncom in warm Desert, sagebrush & pinyon-juniper, Apr-Jul.

24. Calyx 5-6 mm long; fruits erect, 12-18 mm long; plants not smelling of selenium . . . . . **A. ampullarioides** (Welsh) Welsh (Shivwits milkvetch) PerForb, rare in Chinle clay in warm desert, Mar-May (*A. eremiticus* var. *ampullarioides*).

**Colutea** (Bladder-senna)

- C. arborescens** L. (Bladder-senna) Shrub, introduced from Europe and Africa, uncom in oak & pinyon-juniper & cultivated, May-Aug.

**Dalea** (Prairie-clover)

- D. searlsiae** (Gray) Barneby (Searls' prairie-clover) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, May-Jul.

**Gleditsia** (Honey locust)

- G. triacanthos** L. (Honey locust) Tree, introduced from eastern North America, rare. Cultivated. Apr-May.

**Glycyrrhiza** (Licorice)

- G. lepidota** Pursh (Nuttall's licorice) PerForb, uncom in pinyon-juniper & wetlands, May-Jul.

**Lathyrus** (Sweet pea)

1. Leaves with a single pair of leaflets; stems with prominently winged margins . . . . . **L. latifolius** L. (Perennial sweetpea) PerForb, introduced from Europe, uncom in wetlands, disturbed areas, & cultivated, Jun-Aug.
1. Leaves with 3 or more pairs of leaflets; stems without winged margins
  2. Petals white with pink veins; leaflets broadly oval . . . . . **L. lanszwertii** Kell. var. **laetivirens** (Greene ex Rydb.) Welsh (Largeflower sweetpea) PerForb, uncom in sagebrush, pinyon-juniper, oak, montane conifer & wetlands, May-Aug.
  2. Petals pink or bluish-purple; leaflets narrowly linear-elliptic . . . . . **L. brachycalyx** Rydb. var. **zionis** (C.L. Hitchc.) Welsh (Zion sweetpea) PerForb, uncom in sagebrush, pinyon-juniper, oak, & wetlands, Apr-Jun. Type locality from 10 miles E of Zion National Park.

**Lotus** (Lotus, Trefoil)

Includes *Acmispon* and *Ottleya* (segregate genera recognized in Baldwin et al. 2012)

1. Leaves sessile
  2. Leaves pinnately compound with lower pair of leaflets sessile and upper 3 leaflets on a short stalk; flowers 7-10 mm long . . . . . **Lotus tenuis** Waldst. & Kit. ex Willd. (Slender bird's foot trefoil) PerForb, introduced, native to Eurasia; uncom in campgrounds, May-Aug.
  2. Leaves palmately compound, leaflets attached at the same point and all sessile; flowers 12-16 mm long (*Ottleya*) . . . . . **L. utahensis** Ottley (Utah trefoil) PerForb, common in sagebrush, pinyon-juniper, oak, & montane conifer, May-Aug (*Ottleya utahensis*).
1. Leaves with short petioles (*Acmispon*)
  3. Plants perennial; leaflets nearly palmately arranged (typically at least one leaflet slightly offset); inflorescence often with 2 or more flowers arranged on an elongate flowering stalk
    4. Internodes of stem mostly 5 times longer than the leaves; plants 30-70 cm tall . . . . . **L. rigidus** (Benth.) Greene (Bush trefoil) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & wetlands, Mar-May (*Acmispon rigidus*).
    4. Internodes of stem about 2 times longer than the leaves; plants 15-35 cm tall . . . . . **L. plebeius** (Brandege) Barneby (Longbracted trefoil) PerForb, common in warm desert, sagebrush, pinyon-juniper, oak, montane conifer, & wetlands, Apr-Jun (*L. longibracteatus*).
  3. Plants annual; leaflets pinnately compound; flowers single, sessile in leaf axils
    5. Stems prostrate and mat-forming; leaves densely short hairy; banner 5-7 mm long . . . . . **L. humistratus** Greene (Low trefoil) AnnForb, rare in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jun (*Acmispon brachycarpus*).
    5. Stems erect; leaves essentially glabrous; banner less than 4 mm long . . . . . **L. denticulatus** (Drew) Greene (River-bar trefoil) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & wetland, Jun-Aug (*Acmispon denticulatus*).

**Lupinus** (Lupine)

1. Plants annual; cotyledons (large, basal seed leaves) commonly persistent
  2. Cotyledons with a short but obvious stalk, not sessile; inflorescence elongate, usually shorter than the leaves . . . . . **L. concinnus** Agardh **var. orcuttii** (Wats.) Smith (Elegant lupine) AnnForb, common in warm desert, sagebrush, pinyon-juniper, oak, wetlands, Mar-Jun.
  2. Cotyledons sessile, often fused into a cup; inflorescence ball or head-like, or if elongate then usually longer than the leaves
    3. Inflorescence elongated (usually over 2 cm long) and longer than the leaves; calyx may be glabrous . . . . . **L. pusillus** Pursh **var. rubens** (Rydb.) Welsh (Blackbrush lupine) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Apr-Jul.
    3. Inflorescence ball or head-like (less than 2 cm long) and often shorter to as long as the leaves; calyx pubescent
    4. Plants stemless or nearly so, the internodes usually less than 1 cm long; upper calyx lip 2 mm long or less and entire . . . . . **L. brevicaulis** Wats. (Shortstem lupine) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, May-Jul.
    4. Plants with leafy stems, some internodes over 2 cm long; upper calyx lip 3-6 mm long and bilobed . . . . . **L. kingii** Wats. **var. kingii** (King's lupine) AnnForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, May-Aug.
1. Plants perennial; cotyledons not persistent at flowering
  5. Leaflets glabrous on upper surface . . . . . **L. latifolius** Aagardh **var. leucanthus** (Rydb.) Welsh (Broad-leaved lupine) PerForb, rare in pinyon-juniper & oak, Jun-Aug (*L. latifolius* var. *columbianus*).
  5. Leaflets pubescent above
    6. Calyx with a distinct sac-like spur at the base . . . . . **L. caudatus** Kell. **var. utahensis** (Wats.) Welsh (Utah lupine) PerForb, uncom in sagebrush, pinyon-juniper, & montane conifer, May-Aug.
    6. Calyx without a distinct, sac-like spur at the base
      7. Flowers purple or dark blue; banner only slightly reflexed from wings to form a narrow V opening of less than 45 degrees; flowers 9-12 mm long . . . . . **L. argenteus** Pursh **var. argenteus** (Silvery lupine) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, May-Aug.
      7. Flowers pale blue or white; banner reflexed from the wings to form a broad V opening . . . **L. sericeus** Pursh
      8. Flowers white with brown eye-spot; stems with appressed or ascending hairs . . . . . **var. barbiger** (Wats.) Welsh (Sink lupine) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, May-Aug.
      8. Flowers pale blue; stems with spreading or downward-pointing hairs . . . . . **var. jonesii** (Rydb.) Welsh (Jones' lupine) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, May-Aug.

**Medicago** (Alfalfa, Medick)

1. Plants perennial; stems erect; flowers blue or purple, 6-10 mm long; fruits not prickly . . . . . **M. sativa** L. (Alfalfa) PerForb, introduced from Europe, uncom in disturbed areas, May-Sep.
1. Plants annual; stems prostrate to ascending; flowers yellow, 2-5 mm long; fruits prickly or not
  2. Flowers 2-3 mm long; fruits black, not prickly . . . . . **M. lupulina** L. (Black medick) AnnForb, introduced from Europe, uncom in wetlands & disturbed areas, May-Oct.
  2. Flowers 3-5 mm long; fruits tan to brown and prickly . . . . . **M. minima** (L.) Bartal. (Burclover) AnnForb, introduced from Mediterranean, becoming common along roads and trails in Zion Canyon, Apr-Jul.

**Melilotus** (Sweet-clover)

1. Flowers white; pods reticulately veined . . . . . **M. alba** Medik. (White sweet-clover) AnnForb, introduced from Europe, uncom in wetlands & disturbed areas, May-Oct.
1. Flowers yellow; pods cross-ribbed . . . . . **M. officinalis** Lam. (Yellow sweet-clover) PerForb, introduced from Europe, uncom in disturbed areas, May-Oct.

**Pediomelum** (Breadroot)

1. Leaflets 5, uniformly pubescent on surface, 22-35 mm long; flowers 10-13 mm long . . . . . **P. mephiticum** (Wats.) Rydb. (Skunk breadroot) PerForb, uncom in warm desert & pinyon-juniper, Apr-Jun (*Psoralea mephitica*).
1. Leaflets 3-5, more densely pubescent on veins; flowers 11-11.5 mm long . . **P. pariense** (Welsh & Atwood) Grimes (Paria breadroot) PerForb, rare on Carmel limestone in pinyon-juniper, May-Jul.

**Peteria** (Peteria)

- P. thompsoniae** Wats. (Thompson's peteria) PerForb, uncom in warm desert & pinyon-juniper, Apr-Jun. Type locality is "near Kanab", UT.



**Prosopis** (Mesquite)

**P. glandulosa** Torr. **var. torreyana** (Benson) Johnston (Honey mesquite) Tree, uncom in warm desert and sandy washes. May-Sep (*P. juliflora* var. *torreyana*).

**Psoralidium** (Scurf-pea)

1. Corolla blue or purple; floral bracts persistent; mature fruit elliptic . . . . . **P. tenuiflorum** (Pursh) Rydb. (Slender-flowered scurf-pea) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Sep.
1. Corolla white or the keel blue; floral bracts deciduous; mature fruit round . . . . . **P. lanceolatum** (Pursh) Rydb. **var. lanceolatum** (Lemon scurf-pea) PerForb, uncom in sandy soils in sagebrush & pinyon-juniper, Apr-Aug.

**Psorothamnus** (Indigo-bush)

**P. fremontii** (Torr.) Barneby (Fremont's indigo-bush) Shrub, locally common in warm desert, Apr-Jun.

**Robinia** (Locust)

1. Petals white with a yellow spot on banner; main stem of inflorescence hairy but not glandular; fruit pods glabrous . . . . . **R. pseudoacacia** L. (Black locust) Tree, introduced from eastern North America, rare, cultivated, May-Jun.
1. Petals rose or pink without a yellow spot on banner; main stem of inflorescence and fruit pods densely glandular . . . . . **R. neomexicana** Gray (New Mexico locust) Tree, uncom in pinyon-juniper/oak, montane conifer, & wetlands, May-Jul.

**Thermopsis** (Golden pea)

**T. montana** Nutt. in Torr. & Gray (Montane golden pea) PerForb, uncom in montane conifer & wetlands, May-Aug.

**Trifolium** (Clover)

1. Leaves nearly all basal or nearly so, internodes not elongate, usually hidden by dense thatch of old leaf bases; leaflets coarsely toothed and holly-like; flowering stems shorter than the leaves; calyx conspicuously pubescent on teeth and tube . . . . . **T. gymnocarpon** Nutt. in Torr. & Gray (Dwarf clover) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Aug. Leaves occasionally with 5 leaflets.
1. Leaves mostly borne along elongated stem with obvious internodes, not hidden by dense thatch of old leaf bases; leaflets finely toothed but not holly-like; flowering stems longer than the leaves; calyx glabrous or pubescent with mostly ciliate hairs along the teeth
2. Petals pink, drying purplish; flowers all reflexed downward; stem leaves with distinctly shorter petioles than basal leaves and with leaflets lance-shaped rather than oval . . . . . **T. macilentum** Greene (Lean clover) PerForb, common on slickrock in pinyon-juniper & Ponderosa pine, May-Jul.
2. Petals white or greenish-white to purplish; flowers usually erect or spreading as well as deflexed (at least early in season); stem leaves similar in appearance to basal leaves (all with oval leaflets) and with petioles of approximately equal length
3. Petals white; calyx glabrous; stems mostly prostrate . . . . . **T. repens** L. (White clover) PerForb, introduced from Europe, uncom in wetlands & disturbed areas, Apr-Sep.
3. Petals whitish green to purplish; calyx pubescent on the teeth; stems mostly erect . . . . . **T. longipes** Nutt. in Torr. & Gray **var. rusbyi** (Greene) Harrington (Rusby's clover) PerForb, uncom in wetlands, May-Aug.

**Vicia** (Vetch)

1. Perennial; banner petal over 12 mm long . . . . . **V. americana** Muhl. ex Willd. **var. americana** (American vetch) PerForb, common in pinyon-juniper, sagebrush, oak, & montane conifer, May-Aug.
1. Annual; banner petal less than 8 m long . . . . . **V. ludoviciana** Nutt. in Torr. & Gray (Louisiana vetch) AnnForb, rare in warm desert, sagebrush, pinyon-juniper, & oak, Apr-May

**Fagaceae** (Beech Family)

**Quercus** (Oak)

1. Leaves evergreen, the lobes mostly spine-tipped . . . . . **Q. turbinella** Greene (Turbinella live oak) Shrub, common in pinyon-juniper & oak brush, Apr-Jun.
1. Leaves deciduous, the lobes variously angled but not spine-tipped

2. Leaf lobes typically 1-2 times longer than the width of the leaf axis, mostly rounded to obtuse or bi-lobed at the tip (rarely pointed) . . . . . **Q. gambelii** Nutt. **var. gambelii**  
(Gambel oak) Tree, abundant in pinyon-juniper and oak scrub, montane coniferous woods, and wetlands, Apr-Jun.
2. Leaf lobes seldom if ever as long as the width of the leaf axis, mostly acute to pointed at the tip . . . . .  
. . . . . **Q. x pauciloba** Rydb.  
(Few-lobe oak) Shrub, locally common in pinyon-juniper, oak brush, & montane conifer, especially in Zion Canyon foothills, Apr-Jun. Hybrid between *Q. gambelii* x *Q. turbinella*.

### Garryaceae (Silktassel-bush Family)

#### **Garrya** (Silktassel-bush)

**G. flavescens** Watson (Silktassel-bush) Shrub, uncom in pinyon-juniper & montane conifer, Apr-May.

### Gentianaceae (Gentian Family)

1. Corolla cup-shaped, 4-lobed, the lobes equal to or longer than the tube; leaves whorled . . . . . **Swertia**
1. Corolla tubular, 4 or 5-lobed, the lobes shorter than the tube; leaves opposite
  2. Corolla bright pink to rose, 5-lobed; anthers becoming spirally twisted in age . . . . . **Centaurium**
  2. Corolla blue or purple but not pink, 4 or 5 lobed; anthers not spirally twisted in age
    3. Corolla folded into conspicuous plaits (plicate) at the sinuses, usually 5-lobed; calyx tube with a whitish membrane between lobes . . . . . **Gentiana**
    3. Corolla not folded into conspicuous plaits at the sinuses, usually 4-lobed; calyx tube without a whitish membrane between lobes . . . . . **Gentianella**

#### **Centaurium** (Centaury)

1. Corolla lobes 7-12 mm long, only somewhat shorter than tube, basal leaves spoon-shaped . . . . .  
. . . . . **C. calycosum** (Buckl.) Fernald  
(Buckley's centaury) AnnForb, uncom in wetlands, Jun-Sep (*Zeltnera calycosa*).
1. Corolla lobes 3-7 mm long, half as long as tube; basal leaves oblong to linear . . . . .  
. . . . . **C. exaltatum** (Griseb.) Wight ex Piper  
(Great Basin centaury) PerForb, uncom in wetlands, Jun-Sep (*Zeltnera exaltata*).

#### **Gentiana** (Gentian)

**G. affinis** Griseb. **var. affinis** (Rocky Mountain gentian) PerForb, uncom in montane conifer & wetlands, Jul-Sep.

#### **Gentianella** (Gentian)

1. Calyx lobes all equal . . . . . **G. amarella** (L.) Born.  
(Northern gentian) PerForb. Reported (Nelson 1976) from montane conifer, Jul-Aug.
1. Calyx lobes unequal, the outer two sepals large and leafy . . . . . **G. heterosepala** (Engelm.) Holub  
(Engelmann's gentian) PerForb Reported (Welsh 1995), pinyon-juniper/oak & montane conifer, Jun-Aug (*G. amarella* var. *heterosepala*).

#### **Swertia** (Green gentian, Elkweed)

1. Leaves not white-margined, basal leaves over 25 cm long, oblanceolate or spoon-shaped; flowers green with purple spots; calyx 10-25 mm long; glandular depressions (foveae) paired on each corolla lobe . . . . .  
. . . . . **S. radiata** (Kell.) Kuntze  
(Elkweed) PerForb, uncom in pinyon-juniper, oak, sagebrush, & montane conifer, Jun-Aug (*Frasera speciosa*).
1. Leaves with white margins, basal leaves less than 10 cm long, linear to narrowly oblanceolate; flowers white; calyx calyx less than 8 mm long; glandular depressions single on each corolla lobe . . . . .  
. . . . . **S. albomarginata** (Watson) Kuntze  
(White-margined swertia) PerForb, uncom in warm desert, sagebrush, & pinyon-juniper, May-Jul.

### Geraniaceae (Geranium Family)

1. Leaves pinnately lobed or dissected; fertile stamens 5, alternating with 5 scale-like sterile staminodes . . . **Erodium**
1. Leaves palmately lobed or divided; fertile stamens 10, not alternating with sterile staminodes . . . . . **Geranium**

**Erodium** (Stork's-bill)

**E. cicutarium** (L.) L' Hert. (Stork's-bill, Filaree) AnnForb, introduced from Europe, uncom in disturbed areas, warm desert, sagebrush, pinyon-juniper, & oak, Feb-Oct.

**Geranium** (Geranium)

1. Petals pink or purple; inflorescence with yellow or whitish-tipped glandular hairs . . . . . **G. caespitosum** James ex Gray **var. marginale** (Rydb.) Welsh (Small-leaf geranium) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Jun-Aug (*G. atropurpureum*).
1. Petals white with pink or purple veins; inflorescence with purple-tipped glandular hairs . . . . . **G. richardsonii** Fisch & Trautv. (Richardson's crane's-bill) PerForb, Reported (Ott 2010), wetlands, Jun-Aug.

**Grossulariaceae** (Currant or Gooseberry Family)

**Ribes** (Currant, Gooseberry)

1. Branchlets with bristles and spines . . . . . **R. velutinum** Greene **var. velutinum** (Desert gooseberry) Shrub, rare in pinyon-juniper, sagebrush, & oak, Mar-Aug.
1. Branchlets without bristles and spines
  2. Flowers bright yellow or the petals sometimes reddish, glabrous, non-glandular . . . . . **R. aureum** Pursh (Golden currant) Shrub, uncom in sagebrush, pinyon-juniper/oak, montane conifer, & wetlands, Mar-Jul.
  2. Flowers white, pinkish, or cream but not yellow, strongly glandular
    3. Flowers pinkish, floral tube 6-9.4 mm long, sepals 1.4-3.2 mm long; leaf blades 7-30 mm wide . . . . . **R. cereum** Dougl. **var. inebrians** (Lindl.) C.L. Hitchc. (Wax currant) Shrub, uncom in pinyon-juniper, sagebrush, & montane conifer, Apr-Aug.
    3. Flowers greenish-white to cream, floral tube and sepals 4.5-7 mm long; leaf blades 30-100 mm wide . . . . . **R. viscosissimum** Pursh (Sticky currant) Shrub, rare in montane conifer, May-Aug.

**Hydrangeaceae** (Hydrangea Family)

1. Leaves 2-4 cm wide, oval with toothed margins; petals 5, hairy . . . . . **Jamesia**
1. Leaves less than 1.5 cm wide, elliptic to narrowly ovate, margins entire; petals 4 or 5, glabrous
  2. Petals 5, each 2.2-4 mm long; flowers clustered in a branched inflorescence; stamens 10, filament broad at base and tapering to a slender neck below the anther; capsules split into 3 segments at maturity . . . . **Fendlerella**
  2. Petals 4, each 5-17 mm long; flowers solitary at tip of each branch; stamens 20, filaments uniformly slender throughout; capsules split into 4 segments at maturity . . . . . **Philadelphus**

**Fendlerella** (Fendlerella)

**F. utahensis** (Watson) Heller (Utah fendlerella) Shrub, uncom in rock outcrops, pinyon-juniper/oak, & montane conifer, Apr-Sep.

**Jamesia** (Jamesia)

**J. americana** Torr. & Gray **var. zionis** Holmgren & Holmgren (Zion jamesia) Shrub, uncom in hanging gardens, pinyon-juniper, & montane conifer, May-Aug. Type locality is Indian Spring Canyon west of Kanab.

**Philadelphus** (Mock-orange)

**P. microphyllus** Gray (Littleleaf mock-orange) Shrub, uncom in pinyon-juniper/oak & montane conifer, May-Sep.

**Hypericaceae or Guttiferae** (St. Johnswort Family)

**Hypericum** (St. Johnswort)

**H. scouleri** Hook. (Western St. Johnswort) PerForb, uncom in sagebrush, pinyon-juniper, oak, montane conifer, & wetlands, May-Sep (*H. formosum*).

**Iridaceae** (Iris Family)

**Sisyrinchium** (Blue-eyed grass)

**S. demissum** Greene (Blue-eyed grass) PerForb, uncom in wetlands, Apr-Aug.

**Juglandaceae** (Walnut Family)

**Carya** (Hickory)

**C. illinoensis** (Wangh.) K. Koch (Pecan) Tree, introduced from eastern North America, rare, cultivated, Apr-May.

**Juncaceae** (Rush Family)

**Juncus** (Rush)

1. Plants annual
  2. Plants 0.5-2 cm tall; stems scapose with a single, terminal flower; stamens 3 . . . . . **J. bryoides** F. Herm. (Moss rush) AnnGram, uncom in sandy areas in pinyon-juniper, oak, montane conifer, & wetlands, Jun-Jul.
  2. Plants 2-30 cm tall; inflorescence typically with 2-20 flowers; stamens 6 . . . . . **J. bufonius** L. (Toad rush) AnnGram, uncom in sandy areas & wetlands, Jun-Aug.
1. Plants perennial
  3. Flowers each subtended by 2 small bracts at the base of the perianth (in addition to the bract subtending the pedicel)
    4. Lowest bract of the inflorescence erect and appearing to be a continuation of the stem, the inflorescence thus appearing lateral; creeping rhizomes present; leaves reduced to bladeless sheaths . . . . . **J. arcticus** Willd. (Baltic rush) PerGram, uncom in wetlands, May-Jul (*J. balticus*).
    4. Lowest bract of the inflorescence ascending or spreading, not resembling a continuation of the stem, the inflorescence thus appearing terminal; stems tufted, creeping rhizomes lacking; leaf blades well-developed . . . . . **J. tenuis** Willd. (Poverty rush) PerGram, uncom in wetlands, Jun-Aug.
  3. Flowers subtended by a single small bract at the base of the pedicel
    5. Leaf blades flattened or channeled, to 6 mm wide, not septate or the septae usually not extending all the way across
      6. Leaves flat, not folded lengthwise, not having raised cross-ridges (septate); perianth segments with broad, pale, membranous margins . . . . . **J. longistylis** Torr. (Longstyle rush) PerGram, uncom in wetlands, Jun-Aug.
      6. Leaves strongly folded lengthwise and overlapping each other at the base (equitant), septate; perianth segments lack broad, pale, membranous margins . . . . . **J. ensifolius** Wikstr.
    7. Heads usually 10-90, mostly 3-8 mm thick, each with 4-12 light brown flowers . . . . . **var. brunnescens** (Rydb.) Cronq. (Tracy's rush) PerGram, common in wetlands, Jun-Aug.
    7. Heads usually 2-10 (rarely more), mostly 8-15 mm thick, each with 10-25 light to dark brown flowers . . . . . **var. montanus** (Engelm.) C.L. Hitchc. (Mountain rush) PerGram, rare in wetlands, Jun-Aug.
  5. Leaf blades rounded (terete) or subterete, mostly less than 3 mm wide, completely septate
    8. Capsules rounded at tip with a short, abruptly narrowed beak that is shorter than the tepals; stems arising from short rhizomes without swollen nodes . . . . . **J. nevadensis** Wats. (Nevada rush) PerGram, uncom in wetlands, Jun-Aug.
    8. Capsules long-tapering to an elongate beak that equals or is longer than the tepals; stems sometimes arising from swollen nodes. . . . . **J. torreyi** Cov. (Torrey's rush) PerGram, uncom in wetlands, Jun-Aug.

**Lamiaceae or Labiatae** (Mint Family)

1. Plants shrubs, stems woody throughout; flowers with 2 functional anthers
  2. Leaves spoon-shaped to oval, 7-15 mm wide, margins not inrolled; flowers purple, blue, or rarely white, calyx 6 mm long . . . . . **Salvia dorrii**
  2. Leaves linear-elliptic, 1.5-2.5 mm wide, with inrolled margins; flowers pale blue, pink, or white, calyx 4-5 mm long . . . . . **Rosmarinus**
1. Plants annual or perennial herbs with woody stems only at the base; flowers with 2 or 4 functional anthers

3. Corolla regular, radially symmetrical, not obviously 2-lipped
  4. Corolla 5-lobed, inflorescence a long-stalked, terminal, ball-like cluster subtended by broad bracts ..... **Monardella**
  4. Corolla usually 4-lobed; inflorescence of sessile, ball-like clusters in upper leaf axils or an elongate, interrupted spike with narrow bracts
    5. Anther-bearing stamens 4; calyx with 10 veins ..... **Mentha**
    5. Anther-bearing stamens 2; calyx with 4-5 veins ..... **Lycopus**
3. Corolla irregular, bilaterally symmetrical, conspicuously 2-lipped
  6. Plants annual; inflorescence with two or more dense, sessile, ball-like heads and spiny purplish bracts; leaves pinnately lobed ..... **Salvia columbariae**
  6. Plants annual or perennial; inflorescence a terminal spike or of whorled, sessile clusters associated with oval, elliptic, or linear bracts with entire or toothed margins but not spine-tipped; leaves simple with entire or toothed margins
    7. Leaves sessile (or nearly so), 1.5-5 mm wide, narrowly elliptic to ovate with entire margins; stamens 2 per flower ..... **Hedeoma**
    7. Leaves petioled, over 7 mm wide, broadly ovate, elliptic, or lance-shaped with entire to deeply toothed margins; stamens 4 per flower
      8. Calyx with 10 hooked teeth; stems densely white woolly ..... **Marrubium**
      8. Calyx with 5 teeth, not hooked at tips; stems glabrous or pubescent with thin, spreading or backward-pointing hairs or felt-like but not white-woolly
        9. Inflorescence not continuous, consisting of whorls of flowers in axils of normal stem leaves or leaf-like bracts
          10. Plants annual; calyx forming a hood-like or shell-like cup around each corolla; ring of long spines present at the base of the inflorescence; leaves and bracts round and shallowly toothed or lobed, not maple-like ..... **Mollucella**
          10. Plants perennial; calyx not forming a hood-like or shell-like cup; ring of long spines not present at the base of the inflorescence; leaves and bracts deeply 3-5 lobed and maple-like ..... **Leonurus**
        9. Inflorescence terminal, spike-like or panicle-like, bracts relatively inconspicuous except for those at the base of the inflorescence
          11. Leaves elliptic with entire margins; calyx 2-lipped, upper lip with 3 short teeth and lower lip deeply 2-lobed; corolla blue violet, or occasionally pink or white ..... **Prunella**
          11. Leaves lance-shaped to oval, elliptic, or triangular with coarsely toothed margins; calyx of 5 shallowly to deeply divided, nearly equal lobes or if 2-lipped the upper lip with a single broad tooth and the lower lip deeply divided into 4 teeth; corolla pinkish or white
            12. Corolla 10-14 mm long, white, upper lip not hood-like; anthers extend beyond corolla by 1-2 mm ..... **Agastache**
            12. Corolla 6-12 mm long, white dotted with purple or purplish, upper lip erect or hood-like; anthers contained within the corolla or exerted less than 1 mm
              13. Corolla equal in length to calyx, purplish; calyx 2-lipped, with upper lip consisting of a single, broad, spine-tipped tooth and lower lip of 4 deeply lobed spine-tipped teeth ..... **Dracocephalum**
              13. Corolla longer than the calyx, white with purple dots or pink; calyx of 5 nearly equally divided lobes, tips pointed but not spiny
                14. Calyx 2-lipped, upper lip 3-toothed and slightly longer than 2-toothed lower lip; inflorescence spike-like ..... **Nepeta**
                14. Calyx not 2-lipped, of 5 equal teeth; inflorescence open and panicle-like ..... **Origanum**

**Agastache** (Horsemint)

**A. urticifolia** (Benth.) Kuntze (Nettle-leaf horsemint) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Jun-Aug.

**Dracocephalum** (Dragonhead)

**D. parviflorum** Nutt. (Smallflower dragonhead) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Jun-Aug.

**Hedeoma** (Pennyroyal)

**H. nanum** (Torr.) Briq. (Dwarf pennyroyal) PerForb, rare in warm desert, sagebrush, pinyon-juniper, & montane conifer, May-Jun.

[**H. drummondii** Benth. (Mock pennyroyal) Per Forb may occur in Zion based on a fragmentary collection in the Park's Resource Management Herbarium. *H. drummondii* differs from *H. nanum* in having the calyx lobes appressed in fruit (vs. spreading) and in having leaves 3-6 times longer than wide (vs 1-2.5 times)].

**Leonurus** (Motherwort)

**L. cardiaca** L. (Motherwort) PerForb, introduced from Asia, uncom in disturbed areas, Jun-Sep.

**Lycopus** (Bugleweed, Water horehound)

**L. americanus** Muhl. ex Barton (Cut-leaf water-horehound) PerForb, wetlands, Jun-Aug. Reports from Zion NP need confirmation.

**Marrubium** (Horehound)

**M. vulgare** L. (Common horehound) PerForb, introduced from Eurasia, disturbed areas, May-Oct.

**Mentha** (Mint)

1. Inflorescence of sessile, ball-like heads in the axils of ordinary stem leaves . . . . . **M. arvensis** L. var. **glabrata** (Benth.) Fern. (Field mint) PerForb, uncom in wetlands, Jun-Sep.
1. Inflorescence an elongate, interrupted spike, individual flower clusters subtended by small bracts
2. Leaves with petioles at least 4 mm long; flower spikes 1.2-1.8 cm thick at maturity . . . . . **M. x. piperita** L. (Peppermint) PerForb, introduced from Europe, rare in wetlands, Jul-Sep. Hybrid between *Mentha aquatic* x *M. spicata*.
2. Leaves sessile or with petioles to 3 mm long; flower spikes mostly 0.5-1 cm thick at maturity . . . . . **M. spicata** L. (Spearmint) PerForb, introduced from Europe. Reported by Welsh (1995) from wetlands, Jun-Aug.

**Mollucella** (Shellflower, Bells of Ireland)

**M. laevis** L. (Shellflower) AnnForb, introduced from Asia, uncom in Chinle soils and in warm desert & pinyon-juniper, May-Jul.

**Monardella** (Horsemint)

**M. odoratissima** Benth. (Stinking horsemint) PerForb, uncom in rocky pinyon-juniper & montane conifer, May-Aug.

**Nepeta** (Catnip)

**N. cataria** L. (Catnip) PerForb, introduced from Europe, uncom in pinyon-juniper, sagebrush, & oak, Jun-Sep.

**Origanum** (Oregano)

**O. vulgare** L. (Oregano) PerForb; uncom in housing area, introduced from Mediterranean.

**Prunella** (Self-heal)

**P. vulgaris** L. var. **lanceolata** (Bart.) Fern. (Self-heal) PerForb, uncom in montane conifer & wetlands, May-Sep.

**Rosmarinus** (Rosemary)

**R. officinalis** L. (Rosemary) Shrub; native to Europe, cultivated.

**Salvia** (Sage)

1. Multi-branched shrubs, woody at base; leaves and flower bracts entire . . . . . **S. dorrii** (Kell.) Abrams (Dorr's sage) Shrub, uncom in warm desert, sagebrush, & pinyon-juniper, May-Jun.
1. Annual or biennial forb; leaves pinnately lobed; flower bracts spine-tipped . . . . . **S. columbariae** Benth.
2. Flowers white . . . . . var. **argillacea** Welsh & Atwood (Chinle chia) AnnForb, rare in Chinle soils in warm desert, May-Jun.
2. Flowers purple . . . . . var. **columbariae** (Chia) AnnForb, uncom in warm desert & pinyon-juniper, Mar-May.

**Liliaceae** (Lily Family)

Includes Calochortaceae & Convallariaceae. See Amaryllidaceae, Asparagaceae, and Melanthiaceae

1. Perianth of distinct petals and sepals, these different in size, color, and appearance . . . . . **Calochortus**
1. Perianth of essentially uniform tepals (petals and sepals of similar size, color, and petal-like in appearance)
2. Flowers white to greenish; fruit an orange to bright-red berry; leaves ovate to ovate oblong . . . . . **Prosartes**
2. Flowers brownish-purple and mottled; fruit a dry, box-like capsule; leaves linear . . . . . **Fritillaria**

**Calochortus** (Sego lily, Mariposa)

1. Petals bright yellow . . . . . **C. aureus** Wats. (Golden mariposa) PerForb, rare in warm desert, sagebrush, or pinyon-juniper, May-Jun.
1. Petals white, cream, lavender, purple, or bluish-gray

2. Petals purple or lavender, petal gland not surrounded by a raised membrane; flowers distributed along the sprawling to twining stems . . . . . **C. flexuosus** Wats. (Sinuous mariposa) PerForb, uncom in warm desert & pinyon-juniper, Apr-Jun.
2. Petals white, cream, or bluish-gray, petal gland at least partially surrounded by a membrane; flowers in an umbel-like inflorescence on erect stems
3. Petals white or cream-colored; glands round . . . . . **C. nuttallii** Torr. & Gray (Sego-lily) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Jun-Jul.
3. Petals bluish-gray; glands half-moon shaped . . . . . **C. ambiguus** (Jones) Ownbey (Jones' mariposa) uncom in pinyon-juniper, May-Jul.

**Fritillaria** (Fritillary)

**F. atropurpurea** Nutt. (Leopard-lily) PerForb, uncom in sandy areas in warm desert, pinyon-juniper, & montane conifer, Apr-Jul.

**Prosartes** (Fairy bells)

**P. trachycarpa** Wats. (Rough-fruited fairy-bells) PerForb, rare in oak & montane conifer, Jun-Aug (*Disporum trachycarpum*).

**Linaceae** (Flax Family)

**Linum** (Flax)

1. Petals blue, purple, or occasionally white . . . . . **L. lewisii** Pursh (Blue flax) PerForb, uncom in sagebrush, pinyon-juniper/oak, & montane conifer, Apr-Aug (*L. perenne* ssp. *lewisii*).
1. Petals yellow or orange
2. Plants short-lived perennials; sepals persistent in fruit; fruit segments ciliate-margined . . . . . **L. subteres** (Trel.) Winkler (Utah yellow-flax) PerForb, uncom in sandy soils in warm desert, sagebrush, & pinyon-juniper, May-Aug.
2. Plants annuals; sepals not persistent in fruit; fruit segments glabrous . . . . . **L. aristatum** Engelm. in Wisliz. (Broom-flax) AnnForb, uncom in sandy areas in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jun.

**Loasaceae** (Stickleaf Family)

**Mentzelia** (Stickleaf, Blazing-star)

1. Plants annual, petals 5, each 2-7 mm long . . . . . **M. albicaulis** (Dougl. ex Hook.) Gray (White-stem blazing-star) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Aug.
1. Plants biennial or perennial; petals 10, each over 10 mm long
2. Leaves broadly lance-shaped to ovate; petals acute at tip; fruiting capsules 7-10 mm wide . . . . . **M. pterosperma** Eastw. (Wing-seed stickleaf) PerForb, rare in warm desert & pinyon-juniper, Mar-Aug.
2. Leaves narrowly lance-shaped to elliptic; petals obtuse at tip; fruiting capsule 4.5-7 mm wide . . . . . **M. integra** (Jones) Tidest. (Virgin stickleaf) PerForb, uncom in warm desert & pinyon-juniper, Apr-Oct.

**Lythraceae** (Loosestrife Family)

**Lythrum** (Loosestrife)

**L. californicum** Torr. & Gray (California loosestrife) PerForb, rare in wetlands, Jun-Aug.

**Malvaceae** (Mallow Family)

1. Annual with deeply 3-lobed and toothed leaves; 10-13 narrow, linear, curved, bractlets with coarse, ciliate hairs present below the calyx; petals pale yellow with dark maroon base . . . . . **Hibiscus**
1. Perennial or if annual, leaves with oval, kidney-shaped blades with coarse teeth; bractlets absent or number 1-3 below the calyx; petals orange, white, or pinkish

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2. Stigmas filiform; low-growing, prostrate annuals; flowers white to pink ..... *Malva*
2. Stigmas capitate; tall, erect perennials; flowers pinkish, white, orange, or reddish
3. Petals pinkish to white, 20-37 mm long ..... *Iliamna*
3. Petals orange or reddish, 8-20 mm long ..... *Sphaeralcea*

### *Hibiscus* (Hibiscus)

*H. trionum* L. (Flower-of-an-hour) AnnForb; native to Africa, rare in disturbed areas, May-Oct.

### *Iliamna* (Wild hollyhock)

*I. rivularis* (Dougl. ex Hook.) Greene (Wild hollyhock) PerForb, uncom in wetlands & montane conifer, Jun-Oct.

### *Malva* (Mallow)

*M. neglecta* Wallr. (Common mallow) AnnForb, uncom in disturbed areas, introduced from Eurasia, Apr-Oct.

### *Sphaeralcea* (Globe mallow)

1. Leaves deeply lobed and cleft more than halfway to the midrib into 3-5 obvious leaflets
2. Stems and leaves bright green and sparsely pubescent; calyx densely pubescent, more densely hairy than the leaves; ring of fruits 4.5 mm in diameter, each individual mericarp slice 4-5 mm high ..... *S. rusbyi* Gray (Rusby's globemallow) PerForb, rare in warm desert, sagebrush, & pinyon-juniper, Mar-Oct.
2. Stems and leaves grayish-green and moderately to densely pubescent; calyx as densely pubescent as the leaves; ring of fruits 4.5-6.5 mm in diameter, each individual mericarp slice 2.5-4 mm high ..... *S. grossulariifolia* (Hook. & Arn.) Rydb. (Gooseberry-leaf globemallow) PerForb, common in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Mar-Oct.
1. Leaves shallowly 3-5 lobed and toothed on margins, but not cleft halfway to the midrib and without obvious leaflets
3. Petals 9-14 mm long; calyx 5-9 mm long; ring of fruits 4-5.5 mm in diameter ..... *S. parvifolia* A. Nels. (Small-leaf globemallow) PerForb, common in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Mar-Oct.
3. Petals 15-23 mm long; calyx 9-16 mm long; ring of fruits 6-8.5 mm in diameter ..... *S. ambigua* Gray var. *ambigua* (Mohave globemallow) PerForb, uncom in warm desert, sagebrush, & pinyon-juniper, Mar-Sep.

## Martyniaceae or Pedaliaceae (Sesame Family)

### *Proboscidea* (Devil's claw)

*P. parviflora* (Woot.) Woot. & Standl. (Devil's claw) AnnForb, rare in disturbed areas & warm desert, Jun-Aug.

## Melanthiaceae (Death camas Family)

### *Zigadenus* (Death camas)

1. Tepals 3-4.5 mm long; ovary superior (*Toxicoscordion*) ..... *Z. paniculatus* (Nutt.) Watson (Foothills death camas) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Mar-Jun (*Toxicoscordion paniculatum*).
1. Tepals 8-11 mm long; ovary partly inferior (*Anticlea*)
2. Flowers cream to greenish, typically more than 15 mm wide; inflorescence usually a raceme (rarely a panicle) . . . . . *Z. elegans* Pursh (Mountain death camas) PerForb, rare in montane conifer, Jun-Aug (*Anticlea elegans*)
2. Flowers white, typically less than 15 mm wide; inflorescence a panicle ..... *Z. vaginatus* (Rydb.) Macbride (Alcove death camas) PerForb, uncom in wetlands, Jul-Aug (*Anticlea vaginata*).

## Meliaceae (Mahogany Family)

### *Melia* (Chinaberry)

*M. azedarach* L. (Chinaberry) Tree, rare, cultivated, introduced from Asia. Apr-May.



**Molluginaceae or Aizoaceae (Carpetweed Family)**

**Mollugo** (Carpetweed)

**M. cerviana** (L.) Seringe in DC. (Slender carpetweed) AnnForb, uncom in sandy pinyon-juniper or oak, introduced, native to the tropics, Aug-Sep.

**Montiaceae (Springbeauty Family)**

- 1. Stem with a round, shield-like pair of fused leaves below the inflorescence, a rosette of basal leaves also present . . . **Montia**
- 1. Stem leafy but leaves not fused into a shield-like structure, or leaves only in a basal rosette, or appearing absent
  - 2. Stem with a pair of opposite leaves below the inflorescence; plants with underground round corms 1-2 cm in diameter . . . . . **Claytonia**
  - 2. Stems leafless, leaves all in basal rosettes (sometimes withered at flowering time); plants from fleshy or woody roots
    - 3. Sepals 2-4, persistent; petals white or pink, 8-25 mm long . . . . . **Lewisia**
    - 3. Sepals 2, deciduous; petals pink or purple, 5.5-7 mm long . . . . . **Phemeranthus**

**Claytonia** (Springbeauty)

**C. lanceolata** Pall. ex Pursh (Lanceleaf springbeauty) PerForb, uncom in pinyon-juniper, sagebrush, & montane conifer, Apr-Jul.

**Lewisia** (Bitterroot)

- 1. Sepals 4, in two sets and appearing cross-shaped, margins entire; petals white, 12-25 mm long; fruit capsule 8-9 mm long . . . . . **L. brachycalyx** Engelm. (Showy lewisia) PerForb, uncom in pinyon-juniper & montane conifer, Apr-Jun.
- 1. Sepals 2, opposite, margins toothed; petals pink, 8-16 mm long; fruiting capsule 4-6 mm long . . . . . **L. pygmaea** (Gray) B.L. Rob. (Alpine bitter-root) PerForb, uncom in pinyon-juniper/oak & montane conifer, May-Aug.

**Montia** (Miner's lettuce)

**M. perfoliata** (Donn ex Willd.) Howell

- 1. Basal leaves spoon-shaped . . . . . **var. perfoliata** (Miner's lettuce) AnnForb, common in warm desert, pinyon-juniper, and oak, Apr-Jul, (*Claytonia perfoliata*).
- 1. Basal leaves linear . . . . . **var. utahensis** (Rydb.) Poelln. (Miner's lettuce) AnnForb, Historical in warm desert, pinyon-juniper, & oak, Apr-Jul, (*Claytonia parviflora* var. *utahensis*).

**Phemeranthus** (Fame-flower)

**P. confertiflorus** (Greene) Hershk. (Small-flowered fame-flower) PerForb, uncom in sandy areas in pinyon-juniper, sagebrush, & montane conifer, Apr-Sep (*Talinum parviflorum*, *P. parviflorus*).

**Moraceae (Mulberry Family)**

- 1. Leaves regularly 3-5 lobed, to 20 cm wide and 25 cm long; fruit a fleshy hollowed receptacle with flowers borne on the inside (syconium or fig) . . . . . **Ficus**
- 1. Leaves entire to irregularly lobed, 2.5-10 cm wide and 3.5-14 cm long; fruit comprised of multiple fleshy carpels borne in a catkin-like cluster . . . . . **Morus**

**Ficus** (Fig)

**F. carica** L. (Common fig) Tree, extirpated, introduced from the Mediterranean, May-Jun.

**Morus** (Mulberry)

**M. alba** L. (White mulberry) Tree, uncom, introduced from China. Cultivated, Apr-Jun.

**Nyctaginaceae (Four O'clock Family)**

1. Perianth 1-2 mm long; flowers in terminal or axillary spikes or racemes; plants annual; fruits club-shaped 2.5-3 mm long, with 5 ridges and deep furrows ..... **Boerhavia**
1. Perianth 6-60 mm long; flowers in round heads or open racemes or cymes; plants annual or perennial; fruits 1-5 angled, ribbed, winged, or toothed, 3-12 mm long, not deeply furrowed
  2. Flowers white or greenish in round, head-like clusters subtended by 5-10 distinct bracts; perianth tube 10-25 mm long and 1-3 mm wide, slender; fruits 5-12 mm long and 1-5 winged or angled ..... **Abronia**
  2. Flowers white or pink-purple in open racemes or cymes, flowers subtended by a single bract or 5 bracts fused into a cup; perianth tube less than 5 mm and wider than 3 mm; fruits 3-4 mm long with toothed and incurved margins or 4-11 mm long with 5-10 wingless ribs or angles
    3. Plants annual; stems prostrate; flowers pink, shallowly bell-shaped; fruits 3-4 mm long with toothed and incurved margins ..... **Allionia**
    3. Plants perennial; stems erect to ascending; flowers white to pinkish-purple, deeply funnel-shaped; fruits 4-11 mm long with 5-10 wingless ribs or angles ..... **Mirabilis**

**Abronia** (Sand-verbena)

**A. fragrans** Nutt. ex Hook. **var. elliptica** (A. Nels.) Jones (Fragrant sand-verbena) PerForb, com in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer on sandy soils, Apr-Sep (*A. elliptica*).

**Allionia** (Windmills)

**A. incarnata** L. (Trailing four o'clock) PerForb, uncom in warm desert, sagebrush, & pinyon-juniper, Apr-Sep.

**Boerhavia** (Spiderling)

**B. torreyana** (Wats.) Standl. (Spiderling) AnnForb, uncom in sandy areas, Jun-Sep (*B. spicata*, the name used by Welsh et al., 2008, belongs to a different species from much farther south).

**Mirabilis** (Four O'clock)

1. Leaves linear to linear-lanceolate, mainly 10-20 times longer than broad; perianth 8-12 mm long, white to pink . . . . . **M. linearis** (Pursh) Hiemerl (Narrowleaf four o'clock) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, montane conifer, & wetlands, May-Aug.
1. Leaves ovate, cordate, or orbicular, mainly less than 5 times as long as broad; perianth 8-60 mm long, pink or pink-purple
  2. Leaves ovate to round with heart-shaped bases; perianth 40-60 mm long, pink-purple ..... **M. multiflora** (Torr.) Gray (Showy four o'clock) PerForb, uncom in warm desert, & pinyon-juniper, Apr-Jul. Zion specimens have not been determined to variety.
  2. Leaves lance-shaped to ovate with wedge-shaped bases; perianth 8-11 mm long, pink ..... **M. comata** (Small) Standl. (Standley's four-o'clock) PerForb, Reported by Ott (2010), sagebrush & pinyon-juniper, Jul-Oct (*M. pumila* in Welsh et al. 2008).

**Oleaceae (Olive Family)**

1. Flowers without petals; leaves pinnately compound or simple, if simple over 2.5 cm wide; fruit a samara ..... **Fraxinus**
1. Flowers with white petals; leaves simple, 2 cm or less wide; fruit a black berry ..... **Ligustrum**

**Fraxinus** (Ash)

1. Leaves usually simple (occasionally with 1 or 2 leaflets below the terminal one); shrub or small tree 2.5-4 m tall; wing of the samara extends to the base of the seed-bearing body ..... **F. anomala** Torr. ex Wats. (Singleleaf ash) Shrub or Tree, common in warm desert, pinyon-juniper, oak, & montane conifer, Apr-May.
1. Leaves pinnately compound with 3-9 leaflets (rarely some simple); trees over 4 m tall; wing of samara does not extend to the base of the seed-bearing body (*F. velutina*) or extends to the base (*F. pensylvanica*)
  2. Leaflets 3-5, all sessile or nearly so; twigs and petioles velvety-hairy ..... **F. velutina** Torr. (Velvet ash) Tree, locally common in wetland areas. Apr-May.
  2. Leaflets 5-9, short-stalked at the base; twigs and petioles usually glabrous ..... **F. pensylvanica** Marshall (Green ash) Tree, introduced from eastern North America, found in campground and visitor center.

**Ligustrum** (Privet)

**L. vulgare** L. (Common privet) Shrub, introduced and cultivated (native to Europe), Jun-Jul.

**Onagraceae** (Evening primrose Family)

- 1. Flowers present
  - 2. Petals 10-75 mm long
    - 3. Petals scarlet red (*Zauschneria*) . . . . . **Epilobium canum**
    - 3. Petals white, yellow, pink, or purple
      - 4. Floral tube 15-140 mm long . . . . . **Oenothera**
      - 4. Floral tube lacking or 1-8 mm long
        - 5. Flowers pink-purple, floral tube absent; leaves entire, lance-linear, all on stem . . . . . **Chamerion**
        - 5. Flowers yellow, floral tube 1-8 mm long; leaves pinnately lobed, along stem or mostly basal . . . **Chylismia**
  - 2. Petals 1-10 mm long
    - 6. Flowers bilaterally symmetrical (*Gaura*) . . . . . **Oenothera**
    - 6. Flowers radially symmetrical
      - 7. Floral tube absent; petals 1-2.5 mm long . . . . . **Gayophytum**
      - 7. Floral tube 0.5-8 mm long; petals 2-10 mm long
        - 8. Flowers white or pink
          - 9. Petals bi-lobed at tips, white or pink; leaves usually opposite below (except for *E. brachycarpum*, which is alternate throughout) . . . . . **Epilobium**
          - 9. Petals wavy-margined but not bi-lobed at tips, white; leaves alternate . . . . . **Eremothera**
        - 8. Flowers yellow
          - 10. Ovaries and fruits sessile; leaves linear and sessile, entire . . . . . **Camissonia**
          - 10. Ovaries and fruits stalked; leaves oval to elliptic with long petioles, blades entire or pinnately divided . . . . . **Chylismia**
  - 1. Fruits present
    - 11. Seeds with a tuft of long hairs (coma) at end
      - 12. Perennial; leaves alternate . . . . . **Chamerion**
      - 12. Perennial; leaves opposite (annual with alternate upper leaves in *E. brachycarpum*) . . . . . **Epilobium**
    - 11. Seeds glabrous or equally pubescent, without a tuft of long hairs at end
      - 13. Fruit nutlike, not splitting at maturity, 1-few-seeded; flowers with bilateral symmetry (*Gaura*) . . . . . **Oenothera**
      - 13. Fruit multi-seeded capsule that splits open at maturity; flowers with radial symmetry
        - 14. Floral tube not prolonged beyond the ovary; petals mostly less than 2.5 mm long . . . . . **Gayophytum**
        - 14. Floral tube prolonged beyond the ovary; petals mostly over 2.5 mm long (except for some small-flowered species of *Camissonia*)
          - 15. Stigma with 4 elongate, linear lobes . . . . . **Oenothera**
          - 15. Stigma capitate, but without elongate, linear lobes (*Camissonia, sensu lato*)
            - 16. Capsules distinctly stalked, seeds mainly in 2 rows per locule; flowers yellow . . . . . **Chylismia**
            - 16. Capsules sessile or nearly so, seeds in 1 row per locule; flowers yellow or white
              - 17. Flowers yellow, petals 1.5-3.5 mm long, opening in morning; leaves linear; stems glabrous or sparsely hairy but not glandular; capsules slender throughout . . . . . **Camissonia**
              - 17. Flowers white, petals 4-9 mm long, opening in evening; leaves oval; stems glandular; capsules widest at the base and tapering to the tip . . . . . **Eremothera**

**Camissonia** (*Camissonia*, Sundrops)

**C. parvula** (Nutt. ex Torr. & Gray) Raven (Tiny camissonia) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper, & oak, May-Jun.

**Chamerion** (Fireweed)

**C. angustifolium** Alph. Wood var. **canescens** N.H. Holmgren & P.K. Holmgren (Fireweed) PerForb, uncom in pinyon-juniper & montane conifer, Jun-Sep (*Epilobium angustifolium* var. *canescens*).

**Chylismia** (Sundrops)

- 1. Leaves entire or with 1-3 pairs of minute lateral leaflets
  - 2. Capsules 2-10 mm long; petals 3-8 mm long . . . . . **C. parryi** (Wats.) Small (Parry's sundrops) AnnForb, rare in gypsum & clay in warm desert & pinyon-juniper, May-Jun (*Camissonia parryi*).
  - 2. Capsules 25-50 mm long; petals 2-5 mm long . . . . . **C. "bairdii"** (Welsh) combination has not been published (Baird's sundrops) AnnForb, rare in Chinle soils in warm desert & pinyon-juniper, May-Jun (*Camissonia bairdii, Camissonia scapoidea* var. *macrocarpa*).
- 1. Leaves pinnately compound with numerous, sharply toothed lateral leaflets

3. Petals 1.5-5 mm long; anthers 0.5-1.5 mm long, closely surrounding the stigma; fruiting capsule 1.2-4 cm long; leaves mostly in a basal rosette . . . . . **C. walkeri** A. Nels. subsp. **tortilis** (Jeps.) Wagner & Hoch (Walker's sundrops) AnnForb, Historical in warm desert & pinyon-juniper, Apr-Jun (*Camissonia walkeri*).
3. Petals 5-17 mm long; anthers 1.5-6 mm long, shorter than the stigma; fruiting capsule 2-8 cm long; leaves well up the stem or mostly in a basal rosette
4. Petals 5-13 mm long; floral tube 1-3 mm long; capsule 2-5 cm long; leaves mostly in a basal rosette . . . . . **C. multijuga** (Wats.) Small (Manylobe camissonia) AnnForb, uncom in warm desert & pinyon-juniper, Apr-Jun (*Camissonia multijuga*).
4. Petals 8-17 mm long; floral tube 4-8 mm long; capsules 4-8 cm long; leaves distributed along the stem . . . . . **C. brevipes** (Gray) Small (Showy camissonia) AnnForb, rare in warm desert, Apr-May (*Camissonia brevipes*).

**Epilobium** (Willow-herb)

1. Flowers scarlet, floral tube 15-30 mm long, with a row of 8 scales inside (*Zauschneria*) . . . . . **E. canum** (Greene) Raven var. **garrettii** (A. Nels.) N.H. Holmgren & P.K. Holmgren (Hummingbird flower) PerForb, uncom on sandstone slickrock in pinyon-juniper/oak & montane conifer, Jul-Sep (*Zauschneria latifolia* var. *garrettii*).
1. Flowers white or pink; floral tube less than 10 mm long, not scaly inside (*Epilobium, sensu stricto*)
2. Plants annual with a slender taproot; middle leaves usually alternate . . . . . **E. brachycarpum** Presl (Autumn willow-herb) AnnForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Jul-Sep.
2. Plants perennial with clustered roots, rhizomes, or turions; middle leaves usually opposite or nearly so
3. Stigma 4-lobed; plants of dry habitats . . . . . **E. nevadense** Munz (Nevada willow-herb) PerForb, rare in pinyon-juniper, Jun-Sep.
3. Stigma entire, not 4-lobed; plants of wetland habitats
4. Stems glabrous below the inflorescence, glaucous, usually clustered . . . . . **E. glaberrimum** Barbey var. **fastigiatum** (Nutt.) Jeps. (Glaucous willow-herb) PerForb, rare in wetlands, Jun-Aug.
4. Stems pubescent (often in lines) below the inflorescence, not glaucous, usually occurring singly
5. Inflorescence usually branched; petals 1.5-5 (8) mm long, white, pink, or lavender; basal rosette often present; turions lacking . . . . . **E. ciliatum** Raf. (Northern willow-herb) PerForb, uncom in wetlands, Jun-Aug.
5. Inflorescence usually unbranched; petals 3.5-10 mm long; pink or reddish-purple; basal rosette absent; turions present . . . . . **E. glandulosum** Lehm. (Glandular willow-herb) PerForb; Reported by Ott (2010), wetlands, Jun-Aug (*E. ciliatum* var. *glandulosum*).

**Eremothera** (Sundrops, Camissonia)

- E. boothii** (Dougl.) Wagner & Hoch subsp. **alyssoides** (Hook. & Arn.) Wagner & Hoch (Hairy sundrops) AnnForb, Reported by Welsh (1995), warm desert & pinyon-juniper, Jun-Sep (*Camissonia boothii* var. *villosa*).

**Gayophytum** (Groundsmoke)

1. Capsules 3-6 mm long; petals 0.5-1.5 mm long; seeds in 2 rows per locule . . . . . **G. ramosissimum** Torr. & Gray (Branching groundsmoke) AnnForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, May-Aug.
1. Capsules 6-12 mm long; petals 1-2.5 mm long; seeds in 1 row per locule
2. Lateral stem branches separated by 2 or more nodes; first flower borne in lowermost 1-3 nodes . . . . . **G. decipiens** Lewis & Szweyk. (Deceptive groundsmoke) AnnForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Jun-Aug.
2. Lateral stem branches borne at adjacent nodes or separated by 1 node; first flower borne 5 or more nodes above the base . . . . . **G. diffusum** Torr. & Gray var. **strictipes** (Hook.) Dorn (Diffuse groundsmoke) AnnForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, May-Aug.

**Oenothera** (Evening-primrose)

Includes *Gaura*

1. Petals 1.5-7 mm long, floral tube 1.5-11 mm long; flowers bilaterally symmetrical; fruits nut-like and not splitting at maturity (*Gaura*)
2. Multi-stemmed perennial with stems mostly to 0.5 m tall; petals 3-7 mm long, orange-red to maroon; leaves 1-4 cm long . . . . . **O. suffrutescens** (Ser.) Wagner (Scarlet gaura) PerForb, uncom in warm desert, sagebrush, & pinyon-juniper, May-Jul (*Gaura coccinea*).
2. Single-stemmed annual with stems to 2 m tall; petals 1.5-3 mm long, white to pink; largest leaves 4-10 cm long. . . . . **O. curtiflora** Wagner & Hoch (Small-flowered gaura) AnnForb, uncom in wetlands, May-Aug (*Gaura mollis*, *G. parviflora*).

1. Petals 20-75 mm long, floral tube 15-140 mm long; flowers radially symmetrical; fruit a woody capsule that opens at maturity (*Oenothera, sensu stricto*)
2. Plants stemless or nearly so; leaves all basal
  3. Petals white when fresh, fading to pink or purplish . . . . . ***O. caespitosa*** Nutt.
  4. Floral tube mostly 7-14 cm long or more; petals 3-6 cm long; capsule straight . . . . . **var. *marginata*** (Nutt. ex Hook. & Arn.) Munz (Long-tube evening-primrose) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jun.
  4. Floral tube mostly 3.5-7 cm long; petals 2-4.5 cm long; capsule curved . . . . . **var. *crinita*** (Rydb.) Munz (Jones' evening-primrose) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jun.
3. Petals yellow when fresh, fading to bronze or orangish-brown
  5. Plants annual; petals 2-4 cm long; capsules ribbed, but not winged . . . . . ***O. primiveris*** Gray **var. *bufonis*** (Jones) Cronq. (Early evening-primrose) AnnForb, Reported (Welsh 1995) in warm desert & pinyon-juniper, Mar-May.
  5. Plants perennial; petals 1.5-7 cm long; capsules winged in part
    6. Petals 3-7 cm long; leaves pubescent, subentire; capsules broadly winged throughout . . . . . ***O. howardii*** (A. Nels.) Wagner (Bronze evening-primrose) PerForb, rare in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, May-Jul (*O. brachycarpa*).
    6. Petals 1.5-5 cm long; leaves glabrous or nearly so, pinnatifid; capsules winged at tip or base, but not throughout . . . . . ***O. flava*** (A. Nels.) Garrett **var. *flava*** (Yellow evening-primrose) PerForb, uncom in sagebrush, pinyon-juniper, oak, montane conifer, & wetlands, Jun-Jul.
2. Plants with erect, elongate, leafy stems
  7. Flowers yellow when fresh, fading to orange, bronze, or purplish; floral tube 6-12 cm long . . . . . ***O. longissima*** Rydb. (Bridges evening-primrose) PerForb, uncom in wetlands, Jul-Sep.
  7. Flowers white or pink when fresh to pink or lavender; floral tube 1.5-4.5 cm long
    8. Plants annual, taprooted; leaves strongly dimorphic, stem leaves elliptic and deeply pinnately lobed, basal leaves spoon-shaped, entire to shallowly lobed or toothed; stems without a transparent exfoliating layer . . . . . ***O. albicaulis*** Pursh (White-stem evening-primrose) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Mar-Jun.
    8. Plants perennial and spreading by creeping rhizome-like roots; leaves not strongly dimorphic; stems with a transparent exfoliating layer
      9. Leaves and calyx glabrous or glabrate; petals 1.5-2.5 cm long . . . . . ***O. pallida*** Lindl. **var. *pallida*** (Pale evening-primrose) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jul.
      9. Leaves and calyx pubescent with short and long hairs; petals 2.5-4 cm long . . . . . ***O. californica*** (Wats.) Wats. (California evening-primrose) PerForb, Historic in warm desert & pinyon-juniper, May-Jul.

### Orchidaceae (Orchid Family)

1. Leaves reduced to sheaths or scales, plants reddish to brownish-purple; lip petal white with red spots; plants saprophytic . . . . . ***Corallorhiza***
1. Leaves with well-developed blades, green; lip petal white, green, or purplish-brown, without red spots; plants not saprophytic
  2. Leaves green mottled with white, forming a checkerboard pattern, all basal; flowers white tinged with green, pubescent . . . . . ***Goodyera***
  2. Leaves uniformly green, mostly along stem; flowers white, green, or purplish-brown, glabrous
    3. Flowers white or green; lip petal with a prolonged, cylindrical spur from the base . . . . . ***Platanthera***
    3. Flowers brownish-purple; lip petal without a prolonged cylindrical spur from the base . . . . . ***Epipactis***

#### ***Corallorhiza*** (Coral-root)

***C. maculata*** Raf. (Spotted coral-root) PerForb, rare in pinyon-juniper/oak & montane conifer, Jun-Jul.

#### ***Epipactis*** (Helleborine)

***E. gigantea*** Dougl. ex Hook. (Giant helleborine) PerForb, uncom in wetlands, Apr-Aug.

**Goodyera** (Rattlesnake-plantain)

**G. oblongifolia** Raf. (Giant rattlesnake-plantain) PerForb, uncom in pinyon-juniper/oak & montane conifer, Jul-Aug.

**Platanthera** (Bog-orchid, formerly *Habenaria*)

1. Flowers white (rarely whitish-green), borne in a dense, spike-like inflorescence; lip petal widest at base and abruptly contracted to a narrow tip . . . **P. dilatata** (Pursh) Lindl. ex Beck **var. leucostachys** (Lindl.) Luer (Lindley's white bog-orchid) PerForb, uncom in wetlands, Jun-Aug (*Habenaria dilatata* var. *leucostachys*).
1. Flowers green, scattered in an elongate raceme; lip petal linear throughout . . . . . **P. sparsiflora** (Wats.) Schlecht. (Slender bog-orchid) PerForb, rare in wetlands, Jun-Jul (*Habenaria sparsiflora* var. *sparsiflora*).

**Orobanchaceae** (Broomrape Family)

Includes several genera formerly in Scrophulariaceae

1. Stems fleshy, pale tan to orangish, not green; leaves small and scale-like, non-green . . . . . **Orobanche**
1. Stems woody or at least not fleshy, green or brown; leaves fully developed and green
  2. Anther sacs of each stamen similar in size and position; calyx lobes 5; upper lip of the corolla (galea) rounded on back and often extending to a long or short beak; lower lip of corolla with 3 petal-like lobes; leaves pinnatifid, both basal and on stem . . . . . **Pedicularis**
  2. Anther sacs of each stamen of different sizes or position, with one attached by its middle and appearing terminal on the filament and the other attached by its tip and usually hanging down (or reduced or lacking); calyx lobes 2-4; galea straight on back, often tapering to a point or blunt-tipped; lower lip small and beak-like or inflated, but not with petal-like lobes; leaves deeply palmately to pinnately lobed or entire, all on stem
    3. Galea conspicuously surpassing the lower, beak-like lip; plants perennials or if annual (*Castilleja exilis*), the leaves and bracts entire . . . . . **Castilleja**
    - 3 Galea only slightly surpassing or equal to the inflated lower lip; plants annual; leaves deeply lobed
      4. Calyx cleft to base forming 2 segments . . . . . **Cordylanthus**
      4. Calyx not cleft to base, with 4 prominent lobes or teeth . . . . . **Orthocarpus**

**Castilleja** (Paintbrush)

1. Plants annual; stems solitary; leaves and bracts all entire, linear-lanceolate; upper 1/3 to 1/2 of bracts red . . . . . **C. exilis** A. Nels. (Annual paintbrush) AnnForb, rare in wetlands, Jun-Aug (*C. minor* var. *exilis*).
1. Plants perennial; stems usually 2 or more per cluster; leaves or bracts usually lobed or broader than linear; bracts yellow or red throughout
  2. Calyx divided nearly to base on side opposite the galea (much more deeply divided on back than in front), usually more showy than the bracts . . . . . **C. linariifolia** Benth. in DC. (Wyoming paintbrush) PerForb, uncom in pinyon-juniper, oak, sagebrush, & montane conifer, Jun-Aug.
  2. Calyx equally or subequally divided in front and back of the galea, usually less showy than bracts
    3. Base of stems clothed with appressed, scale-like leaves; upper lip of corolla (galea) well exerted beyond the calyx . . . . . **C. scabrida** Eastw. **var. scabrida** (Eastwood's paintbrush) PerForb, common on Navajo sandstone slickrock from warm desert to montane zone, May-Jul. Signature Zion plant of red sandstone cliffs along the East Entrance road.
    3. Base of stem without scale-like leaves; upper lip of corolla equaling or only slightly longer than the calyx
      4. Upper leaves deeply cleft into linear, spreading lobes; herbage pubescent with long, spreading hairs; calyx slightly more deeply cut on side of galea than in front . . . . . **C. chromosa** A. Nels. (Desert paintbrush) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, & oak, Apr-Jun. (*C. angustifolia* var. *dubia*, misapplied).
      4. Upper leaves entire or only shallowly lobed at tip; herbage glabrous to glandular pubescent, but with short hairs . . . . . **C. miniata** Dougl. ex Hook. (Scarlet paintbrush) PerForb, uncom in montane conifer & wetlands, Jul-Aug.

**Cordylanthus** (Bird's-beak)

1. Herbage glabrous to finely glandular with hairs 0.1 mm long; corolla mostly yellow marked with purple . . . . . **C. wrightii** Gray (Wright's bird's-beak) AnnForb; rare in sandy pinyon-juniper near East Entrance; Aug-Oct, Zion plants are more robust than typical
1. Herbage densely glandular, hairs well over 0.1 mm long; corolla violet-pink to purple
  2. Corolla violet-pink with yellow tips, 13-20 mm long; upper corolla beak (galea) conspicuously longer than the lower beak; calyx 11-16 mm long; bract subtending each flower entire . . . . . **C. parviflorus** (Ferris) Wiggins (Smallflower bird's-beak) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Aug-Sep.

2. Corolla violet or purple, 20-34 mm long; upper corolla beak (galea) about equal to the lower beak; calyx 14-27 mm long; bract subtending each flower with 3-7 lobes ..... **C. kingii** Wats. **var. kingii** (King's bird's-beak) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper/oak, & montane conifer, Jun-Sep.

**Orobanche** (Broomrape)

1. Flowers sessile or on pedicels less than 2 cm long, with 1 or 2 narrow bractlets in addition to the broad, subtending bract ..... **O. ludoviciana** Nutt. (Cooper's broomrape) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, & oak, May-Jul.
1. Flowers on pedicels over 3 cm long, without bracts
  2. Stems slender, with 1-2 flowers on pedicels that greatly exceed the stem; calyx lobes slender and long-pointed, longer than the tube ..... **O. uniflora** L. (Naked broomrape) PerForb; Reported by Ott (2010), in sagebrush & wetlands, May-Jul (*Aphyllon uniflorum*).
  2. Stems thick and stout, with 3-several flowers on pedicels that are equal in length to the stem or shorter; calyx lobes triangular, equal or shorter than the tube ..... **O. fasciculata** Nutt. (Clustered broomrape) PerForb, rare in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Jun-Jul.

**Orthocarpus** (Owl-clover)

- O. luteus** Nutt. (Yellow owl-clover) AnnForb, uncom in pinyon-juniper/oak, sagebrush, montane conifer, & wetlands, Jul-Aug.

**Pedicularis** (Lousewort)

- P. centranthera** Gray in Emory (Dwarf lousewort) PerForb, uncom in pinyon-juniper, Apr-Jun.

**Oxalidaceae** (Wood sorrel Family)

**Oxalis** (Wood sorrel)

- O. corniculata** L. (Creeping wood sorrel) PerForb, rare (native to Europe), escaped in courtyard of Zion NP offices and museum, Apr-Oct.

**Papaveraceae** (Poppy Family)

Includes Fumariaceae

1. Flowers bilaterally symmetrical, pea-like; leaves thrice pinnately compound, fern-like (Fumariaceae) ..... **Corydalis**
1. Flowers radially symmetrical, not pea-like; leaves ternately compound (divided into threes) or spiny and thistle-like (Papaveraceae *sensu stricto*)
  2. Stems and leaves spiny; flowers white ..... **Argemone**
  2. Stems and leaves glabrous; flowers yellow ..... **Eschscholzia**

**Argemone** (Prickly poppy)

- A. munita** Durand & Hilg. **var. rotundata** (Rydb.) Shinners (Armed prickly-poppy) PerForb, uncom in warm desert, sagebrush, & pinyon-juniper, May-Sep.

**Corydalis** (Corydalis)

- C. aurea** Willd. (Golden corydalis) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Sep.

**Eschscholzia** (Golden-poppy)

1. Leaves on stem and basal; petals 3-11 mm long ..... **E. minutiflora** Wats. (Pygmy golden-poppy) AnnForb, Historic in warm desert, pinyon-Juniper, Apr-May.
1. Leaves all basal; petals 10-25 mm long ..... **E. glyptosperma** Greene (Desert golden-poppy) AnnForb, Historic in warm desert, Mar-May.

**Phrymaceae** (Lopseed Family)

Formerly included in Scrophulariaceae

- 1. Flowers sessile or nearly so (pedicel shorter than or equal to calyx) ..... **Diplacus**
- 1. Flowers on long pedicels, well exceeding the calyx
  - 2. Calyx cleft much less than half its length in front, the tube 5-angled or pleated; plants annual or perennial (*Mimulus*) ..... **Erythranthe**
  - 2. Calyx cleft more than half its length in front, the tube not 5-angled or pleated; plants annual ..... **Mimetanthe**

**Diplacus** (Monkeyflower)

**D. parryi** (Gray) Nesom & Fraga (Parry's monkeyflower) AnnForb, uncom in warm desert shrub, Apr-Jun, type locality is Virgin, UT. (*Mimulus parryi*). *Diplacus bigelovii* (Gray) Nesom occurs west of Zion NP and differs in having magenta to violet flowers and stems with glandular pubescence.

**Erythranthe** (Monkeyflower)

Formerly *Mimulus*. Guy Nesom and colleagues have been revising this genus in recent years (Barker et al. 2012, Nesom 2012a, 2012b, 2014) and Zion specimens should be re-examined to see if other taxa are present, especially in the *Erythranthe guttata* complex.

- 1. Plants perennial with rhizomes or stolons
  - 2. Corolla scarlet or orange throughout, 35-50 mm long ..... **E. verbenacea** (Greene) Nesom & Fraga (Cardinal monkeyflower) PerForb, uncom in hanging gardens, May-Aug (*Mimulus cardinalis* in Fertig & Alexander 2009). According to Nesom (2014), *E. cardinalis* ranges west of Utah and differs from *E. verbenacea* in having spreading anthers and corolla throats exerted 2-11 mm beyond the calyx (vs. reflexed anthers and corolla throats exerted 13-25 mm beyond the calyx in *E. verbenacea*).
  - 2. Corolla yellow (sometimes marked with red), 10-30 mm long
    - 3. Corolla throat open; calyx teeth obtuse, not folded inward in fruit ..... **E. utahensis** (Pennell) Nesom (Glabrous monkeyflower) PerForb, uncom in wetlands, Jun-Aug (*Mimulus glabratus*)
    - 3. Corolla throat nearly closed (upper and lower lobes of corolla are nearly touching); calyx teeth often acute, folded inward in fruit ..... **E. guttata** (Fisch. ex DC.) Nesom (Yellow monkeyflower) PerForb, common in wetlands, Jun-Aug (*Mimulus guttatus*).
- 1. Plants annual or lacking rhizomes or stolons
  - 4. Leaves mostly ovate to cordate, usually petioled, margins coarsely toothed
    - 5. Herbage glabrous or pubescent, but not glandular; calyx teeth unequal, the upper one conspicuously larger than the others; corolla 10-15 mm long, the throat nearly closed ..... **E. cordata** (Greene) Nesom (Small-flowered yellow monkeyflower), AnnForb, com in wetlands, Jun-Aug (formerly included within *Mimulus guttatus*)
    - 5. Herbage glandular; calyx teeth nearly equal; corolla 5-10 (14) mm long, the throat open ..... **E. floribunda** (Dougl. ex Lindl.) Nesom (Seep monkeyflower) AnnForb, uncom in wetlands, May-Jul.
  - 4. Leaves linear to narrowly lanceolate or oblanceolate, sessile or essentially so, margins entire
    - 6. Calyx teeth ciliate on margins; corolla 7-9 mm long, yellow or reddish ..... **E. rubella** (Gray) Fraga (Reddish monkeyflower) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper, & montane conifer, Apr-Jun (*Mimulus rubellus*).
    - 6. Calyx teeth not ciliate on margins (occasionally glandular), corolla 4-7 mm long, yellow ..... **E. suksdorfii** (Gray) Fraga (Suksdorf's monkeyflower) AnnForb, uncom in sandy areas in warm desert, pinyon-juniper/oak, sagebrush, & montane conifer, May-Jun (*Mimulus suksdorfii*).

**Mimetanthe** (Mimetanthe)

**M. pilosa** (Bentham) Greene (Hairy mimetanthe) AnnForb, rare in sandy areas in warm desert, pinyon-juniper, & wetlands, Jun-Aug.

**Pinaceae** (Pine Family)

- 1. Leaves borne in clusters of 2-5 ..... **Pinus**
- 1. Leaves borne singly
  - 2. Leaves narrowed to a very short petiole at base; ovulate cones hanging downward, with 3-lobed bracts protruding from between the scales; remaining intact at maturity, terminal buds not resinous ..... **Pseudotsuga**
  - 2. Leaves usually about the same width all the way to the base; ovulate cones erect, without protruding bracts, falling apart at maturity; terminal buds resinous ..... **Abies**



**Abies** (Fir)

1. Branchlets glabrous or nearly so; needles 2.5-5.5 cm long and over 1.8 mm wide, usually flat . . . . . **A. concolor** (Gord. & Glen.) Lindl. ex Hild. (White fir) Tree, uncom in montane conifer woods and shady canyons.
1. Branchlets pubescent; needles 2-3 cm long and less than 1.8 mm wide, usually curved upwards . . . . . **A. lasiocarpa** (Hook.) Nutt. (Subalpine fir) Tree, rare in montane conifer woods (*A. bifolia*).

**Pinus** (Pine)

1. Leaves usually single, round in cross-section, often curved . . . . . **P. monophylla** Torr. & Frem. (Singleleaf pinyon) Tree, common in low elevation pinyon-juniper woodlands.
1. Leaves usually in bundles of 2-3 (rarely single on some twigs of *P. edulis*), semi-circular in cross-section, usually straight
  2. Leaves mostly in bundles of 2, mostly less than 5 cm long; seed cones less than 5 cm long and lacking prickles . . . . . **P. edulis** Engelm. in Wisliz. (Two-needle pinyon) Tree, Widespread at mid to higher elevations in pinyon-juniper woodlands, oak scrub, & montane coniferous forests.
  2. Leaves mostly in bundles of 3 (rarely 2 on some twigs), mostly over 7 cm long; seed cones mostly over 6 cm long and with a stout prickle . . . . . **P. ponderosa** Dougl. ex Laws. & Laws. (Ponderosa pine) Tree, common in montane conifer forests, often associated with slickrock.

**Pseudotsuga** (Douglas-fir)

**P. menziesii** (Mirb.) Franco **var. glauca** (Beissn.) Franco (Douglas-fir) Tree, uncom in montane conifer forests or conifer forests or shady canyons.

**Plantaginaceae** (Plantain Family)

Includes genera formerly in Scrophulariaceae

1. Corolla of 4 petals or lobes
  2. Flowers regular, petals equal, membranous; fruit an egg-shaped capsule, not flattened . . . . . **Plantago**
  2. Flowers irregular, petals unequal, lowest much smaller and narrower than the other three, blue or purplish-white; fruit heart-shaped and flattened . . . . . **Veronica**
1. Corolla of 5 petals or lobes (one lobe very small in *Collinsia*)
  3. Leaves alternate (on upper stem below the inflorescence); flowers yellow with a spur at the base . . . . . **Linaria**
  3. Leaves opposite (at least at base of stem and below inflorescence); flowers blue, purple, red, or white, lacking a spur at the base
    4. Plants perennial; flowers well over 1 cm long, blue, purple, or red with an elongate corolla tube; staminode (sterile fifth stamen) well-developed, strap-shaped and usually densely bearded . . . . . **Penstemon**
    4. Plants annual; flowers 0.5-0.7 cm long, blue and white; corolla tube short, barely exceeding the calyx; staminode greatly reduced, not strap-shaped or bearded . . . . . **Collinsia**

**Collinsia** (Blue-eyed Mary)

**C. parviflora** Dougl. ex Lindl. (Blue-eyed Mary) AnnForb, common in warm desert, sagebrush, pinyon-juniper/oak, & montane conifer, Apr-Jun.

**Linaria** (Toadflax)

**L. dalmatica** (L.) Miller (Dalmatian toadflax) PerForb, introduced from Europe, Reported by Cogan et al. (2004), disturbed areas in pinyon-juniper, oak, montane conifer, & wetlands, Jul-Aug.

**Penstemon** (Beardtongue, Penstemon)

1. Corolla bright red, scarlet, or orange
  2. Corolla strongly two-lipped, with the lower lip reflexed
    3. Anthers horseshoe-shaped and split open across the top (at the point of attachment of the two anther sacs), the tips of the anther sacs remaining unopened . . . . . **P. rostriflorus** Kell. (Beaked penstemon) PerForb, uncom in warm desert, pinyon-juniper/oak, montane conifer, & wetlands, Jun-Aug, (*P. bridgesii*).
    3. Anthers widely spreading and not split open across the top; anther sacs splitting at their free ends, remaining unopened at the middle . . . . . **P. barbatus** (Cav.) Roth in A. DC. **var. barbatus** (Beardlip penstemon) PerForb, uncom in montane conifer & wetlands, Jun-Jul.
  2. Corolla tubular, lower lip not strongly reflexed

4. Anthers widely spreading, anther sacs splitting open their entire length (including across the point of attachment of the two sacs) . . . . . ***P. utahensis*** Eastw. (Utah penstemon) PerForb, uncom in warm desert & pinyon-juniper, Apr-Jun.
4. Anthers horseshoe shaped and splitting open at the tips of each anther sac, but not across the point of attachment of the two sacs. . . . . ***P. eatonii*** Gray
5. Stems and leaves glabrous . . . . . **var. *eatonii*** (Eaton's firecracker penstemon) PerForb, uncom in warm desert, sagebrush, pinyon-juniper/oak & montane conifer, May-Jul.
5. Stems and leaves finely pubescent . . . . . **var. *undosus*** Jones (Undulate penstemon) PerForb, uncom in warm desert, sagebrush, pinyon-juniper/oak & montane conifer, May-Jul.
1. Corolla blue, purple, violet, maroon, or pink
6. Anther sacs splitting open from the tips but not across the point of attachment of the two sacs
7. Surface of anthers obscured by long, tangled, woolly hairs . . . . . ***P. comarrhenus*** Gray (Dusty penstemon) PerForb, uncom in pinyon-juniper, oak, sagebrush, & montane conifer, Jun-Aug.
7. Surface of anthers glabrous, lacking long tangled woolly hairs
8. Calyx and corolla glandular-pubescent on outside; anther sacs 1.2-2 mm long . . . . . ***P. leiophyllus*** Penn. (Markagunt penstemon) PerForb, uncom in pinyon-juniper/oak & montane conifer, Jun-Aug.
8. Calyx and corolla glabrous on outside; anther sacs 1.8-2.5 mm long
9. Corolla blue to lavender, 20-35 mm long . . . . . ***P. laevis*** Penn. (Smooth penstemon) PerForb, uncom in sagebrush, pinyon-juniper/oak & montane conifer, May-Jun. Type locality from Springdale, UT.
9. Corolla reddish purple to maroon, 25-30 mm long . . . . . ***P. xjonesii*** Penn. (Fuchsia penstemon) PerForb, uncom in pinyon-juniper/oak & montane conifer, May-Jun. Hybrid between *P. eatonii* x *P. laevis*. Type locality from Springdale, UT. (Hybrid between *P. laevis* and *P. eatonii* var. *undosus*).
6. Anthers sacs splitting open their entire length, or only across the point where the two sacs are attached (not opening at their tips)
10. Leaves linear, entire, less than 4 cm long or 5 mm wide, leaf pubescence of round, tapering and backward-curved hairs or glabrate . . . . . ***P. linarioides*** Gray **var. *sileri*** Gray (Siler's penstemon) PerForb, uncom in sagebrush, pinyon-juniper/oak & montane conifer, May-Aug.
10. Leaves lanceolate, oblanceolate, or elliptic (but not linear) entire to toothed, some over 4 cm long or 5 mm wide; leaf pubescence of slender, erect hairs or lacking
11. Anthers splitting open only at their midpoint where the two anthers sacs are attached (remaining closed at their tips); anthers horseshoe-shaped
12. Calyx less than 3.2 mm long, sepals ovate with obtuse to acute tips; corolla 20-30 mm long . . . . . ***P. sepalulus*** A. Nels. (Littlecup penstemon) PerForb, Historic, in montane conifer, Jun-Jul.
12. Calyx over 3.4 mm long, sepals lanceolate with attenuate tips; corolla 12-14 mm long . . . . . ***P. higginsii*** (Neese) Holmgren & Atwood (Higgins' penstemon) PerForb, uncom in pinyon-juniper/oak & Ponderosa pine, Jun-Jul, type locality from Pine Valley.
11. Anthers splitting open their entire length (including the point of attachment of the two anther sacs); sacs often widely spreading as if attached end to end
13. Leaves prominently and regularly toothed, upper stem leaves sessile or fused at the base and appearing to completely wrap around the stem; flowers creamy white to pink and inflated . . . . . ***P. palmeri*** Gray
14. Inflorescence axis and corolla regularly pubescent or glandular . . . . . **var. *palmeri*** (Palmer's penstemon) PerForb, uncom in warm desert, sagebrush, pinyon-juniper/oak & montane conifer, May-Aug.
14. Inflorescence axis and corolla glabrous . . . . . **var. *eglandulosus*** (Keck) NH Holmgren (Palmer's penstemon) PerForb, uncom in pinyon-juniper/oak & montane conifer, May-Aug.
13. Leaves entire or finely to obscurely toothed, upper stem leaves petiolate or sessile, but not fused at the base and appearing to completely wrap around the stem; flowers blue or lavender
15. Inflorescence axis and corolla regularly pubescent or glandular on outside; stem leaves often finely toothed. . . . . ***P. humilis*** Nutt. ex Gray **var. *obtusifolius*** (Penn.) Reveal (Zion penstemon) PerForb, Common on sandy soil and sandstone in pinyon-juniper/oak and montane conifer, May-Jun. Type locality from Springdale, UT.
15. Inflorescence axis and corolla glabrous on outside; stem leaves entire
16. Leaves green, thin-textured; stems glabrous or often pubescent; sepals becoming abruptly acuminate at tip . . . . . ***P. rydbergii*** A. Nels. **var. *aggregatus*** (Penn.) Keck (Rydberg's penstemon) PerForb, rare in montane conifer, Jun-Jul.

16. Leaves bluish-green, thick and leathery; stems glabrous; sepals acute or gradually tapering at tip
17. Corolla densely glandular inside near mouth; staminode glabrous or papillate; flowers lavender, rose-pink, or purplish-red . . . . . **P. confusus** Jones (Mistaken penstemon) PerForb, uncom in warm desert & pinyon-juniper, Apr-Jun.
17. Corolla not densely glandular inside near mouth; staminode densely bearded; flowers blue to violet . . . . . **P. pachyphyllus** Gray ex Rydb. **var. congestus** (Jones) NH Holmgren (Rockville penstemon) PerForb, uncom in warm desert, pinyon-juniper/oak & montane conifer, May-Jul. Type locality from Rockville, UT.

**Plantago** (Plantain)

1. Plants annual; stems and leaves woolly-villous; leaves oblanceolate to narrowly linear, 1-7 mm wide . . . . . **P. patagonica** Jacq. (Woolly plantain or Indian wheat) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Mar-Aug.
1. Plants perennial; stems and leaves glabrous except for crown of the caudex; leaves lanceolate, oblanceolate, elliptic, or oval, over 10 mm wide
2. Ovules and seeds 6-30; leaf blades broadly ovate or elliptic and abruptly tapered to the petiole, mostly 1.3-2.3 times longer than wide . . . . . **P. major** L. (Common plantain) PerForb, uncom in disturbed areas, warm desert, & sagebrush, introduced from Europe.
2. Ovules and seeds 2-4; leaf blades lanceolate to oblanceolate or if elliptic mostly 2.5-10 times as long as wide, gradually tapering to the petiole . . . . . **P. lanceolata** L. (English plantain) PerForb, uncom in wetlands, introduced from Eurasia, May-Aug.

**Veronica** (Speedwell, Brooklime)

1. Glandular-pubescent annual; flowers in a terminal inflorescence or solitary and axillary, corollas white . . . . . **V. peregrina** L. **var. xalapensis** (H.B.K.) St. John & Warren (Purslane speedwell) AnnForb, uncom in wetlands, Jun-Aug.
1. Glabrous perennial; flowers in axillary racemes, corollas blue
2. Middle and upper leaves short-petioled . . . . . **V. americana** Schwein. ex Benth. (American brooklime) PerForb, uncom in wetlands, Jul-Aug.
2. Middle and upper leaves sessile . . . . . **V. anagallis-aquatica** L. (Water speedwell) PerForb, introduced from Europe, uncom in wetlands, Jun-Aug.

**Platanaceae** (Sycamore Family)

**Platanus** (Sycamore)

**P. occidentalis** L. (American sycamore) Tree, uncom, introduced, native to eastern North America. Cultivated. May-Jun.

**Poaceae or Gramineae** (Grass Family)

1. Spikelets clustered in dense, ball-like heads
2. Spikelets enclosed in a prickly bur, the bur dropping intact from flowering stem at maturity; inflorescence borne well above the leaves; stems tufted, annual . . . . . **Cenchrus**
2. Spikelets not enclosed in a prickly bur that drops intact (although glumes or subtending leaves may be sharp-tipped); inflorescences often embedded among tuft of leaves; stems annual with spreading stolon-like stems or perennial with rhizomes
3. Plants perennial with rhizomes; flowers unisexual, all pistillate . . . . . pistillate plants of **Buchloe**
3. Plants annual with spreading stolon-like stems; flowers bisexual . . . . . **Munroa**
1. Spikelets not clustered in dense, ball-like heads
4. Spikelets round (dorsally compressed or terete); uppermost floret of spikelet perfect, usually subtended by a sterile or staminate floret that may look like an extra glume; spikelets disarticulating below the glumes, the spikelets falling entire either singly or in pairs with segments of the rachis . . . . . Group 1
4. Spikelets flattened (laterally compressed); perfect florets one to many, sterile or staminate florets (if present) located above the perfect florets; spikelets usually disarticulating above the glumes (disarticulating below the glumes in *Hilaria*, *Phleum*, *Polypogon* and *Sphenopholis*)
5. Spikelets sessile or subsessile (when more than one spikelet present at a node, the lateral spikelets may be short-pedicelled); inflorescence a single spike or 2 or more digitately or racemosely arranged spicate branches . . . . . Group 2
5. Spikelets pedicellate (nearly sessile in *Phleum*); inflorescence an open or contracted (sometimes spike-like) panicle or raceme

- 6. Spikelets with one functional (fertile) floret surrounded by a pair of hairy scale-like sterile lower florets; plants strongly rhizomatous with culms 50-150 cm tall and panicles 7-20 cm long . . . . . **Phalaris**
- 6. Spikelets with one to many functional florets, if one-flowered lacking sterile, scale-like lower florets; plants rhizomatous or tufted, culms or panicles typically smaller
- 7. Spikelets 1-flowered (rarely with a reduced lemma on an extended rachilla) . . . . . Group 3
- 7. Spikelets 2 to many flowered
  - 8. Glumes (at least the second glume) as long or longer than the lowest florets or as long as the spikelet; lemmas awnless or with dorsal awns or awned from a bifid apex . . . . . Group 4
  - 8. Glumes shorter than the first floret; lemmas awnless or awned from the tip or from a bifid apex, the awn rarely slightly dorsal . . . . . Group 5

**Group 1: Spikelets round, disarticulating below the glumes (Panicoid grasses)**

- 1. Sterile lemma resembling the second glume and appearing like a third glume; fertile lemma and palea harder than the membranous glumes
  - 2. Spikelets enclosed in a prickly bur or subtended by persistent, hair-like bristles
    - 3. Spikelets enclosed in a prickly bur, the bur dropping intact from flowering stem at maturity . . . . . **Cenchrus**
    - 3. Spikelets deciduous and subtended by 1 to many persistent, hair-like bristles . . . . . **Setaria**
  - 2. Spikelets not enclosed in a prickly bur or subtended by persistent, hair-like bristles
    - 4. Spikelets on short stalks and located on one side of flattened panicle branches; glumes and sterile lemma not awned
      - 5. Plants annual; raceme branches 3 or more, digitately arranged (finger-like) . . . . . **Digitaria**
      - 5. Plants perennial; raceme branches single or paired . . . . . **Paspalum**
    - 4. Spikelets either long-stalked and in open to contracted panicles or if short-stalked glumes or sterile lemma awned
      - 6. Glumes or sterile lemma awned or awn-tipped; spikelets in irregular clusters along one side of the panicle branches, the spikelets stiffly hispid; ligule lacking . . . . . **Echinochloa**
      - 6. Glumes and sterile lemma awnless; spikelets in openly branching inflorescences or if in one-sided clusters the spikelets glabrous or at least not hispid; ligule present, consisting of ring of hairs . . . . . **Panicum**
- 1. Sterile lemma and fertile lemma unlike in texture and not resembling the glumes; fertile lemma and palea usually softer than the hardened glumes
  - 7. Spikelets all alike and fertile . . . . . **Sorghastrum**
  - 7. Spikelets not all alike, the pedicelled spikelets staminate or sterile
    - 8. Inflorescence an open or contracted panicle; hairs of rachis joints and pedicels less than 1.2 mm long . . . . . **Sorghum**
    - 8. Inflorescence of 1 to several spicate racemes; hairs of rachis joints and pedicels 1-9 mm long
      - 9. Racemes solitary on each peduncle . . . . . **Schizachyrium**
      - 9. Racemes 2 to many on each peduncle
        - 10. Racemes 2-6 on each peduncle, digitate and spreading; rachis joints slender, usually without a shallow groove on one side . . . . . **Andropogon**
        - 10. Racemes usually 10 or more on each peduncle, appressed into a thick spike; pedicels and rachis joints flat, each with a central groove . . . . . **Bothriochloa**

**Group 2: Spikelets flattened, sessile**

- 1. Spikelets in 2 rows along 2 sides of a 3-angled, continuous rachis, forming 1-sided spikes or racemes, these branches usually 2 to several and arranged in digitate or raceme-like clusters, or solitary and spike-like; leaves not auriculate
  - 2. Inflorescence branches arranged in racemose clusters on an elongate axis or solitary and terminal
    - 3. Plants perennial with long-spreading rhizomes; spikelets of 2 florets, all staminate . . . . . staminate plants of **Buchloe**
    - 3. Plants annual or perennial, usually tufted or with short rhizomes; spikelets with one perfect floret and 1-3 smaller, staminate florets . . . . . **Bouteloua**
  - 2. Inflorescence branches arranged digitately (like fingers of a hand) at tip of culm
    - 4. Spikelets with 2 or more fertile florets . . . . . **Eleusine**
    - 4. Spikelets with a single fertile floret (*Chloris* with additional small, sterile florets above the basal fertile floret)
      - 5. Annual; spikelets with 1 or more modified florets above the perfect floret; lemmas long-awned; ligule membranous with a fringe of hairs . . . . . **Chloris**
      - 5. Perennial; spikelets without additional modified florets above the perfect floret; lemmas awnless; ligule a fringe of long hairs . . . . . **Cynodon**
- 1. Spikelets or spikelet clusters alternate on opposite sides of the rachis; spikes terminal, solitary; leaves often, but not always, auriculate
  - 6. Plants annual

- 7. Lemmas awnless, obtuse or truncate at tip; leaves without auricles . . . . . **Sclerochloa**
- 7. Lemmas long-awned from acute tip; leaves with prominent auricles
  - 8. Spikelets 3 per node . . . . . **Hordeum**
  - 8. Spikelets solitary at each node
    - 9. Spikelets cylindrical, sunken into the inflorescence axis; sheaths ciliate margined or hairy . . . . . **Aegilops**
    - 9. Spikelets laterally flattened, not sunken into the inflorescence axis; sheaths glabrous
      - 10. Spikelets (2) 3-5 flowered; glumes ovate and 3-7 nerved . . . . . **Triticum**
      - 10. Spikelets 2-flowered; glumes narrowly lanceolate, mostly 1-nerved . . . . . **Secale**
- 6. Plants perennial
  - 11. Rachis remaining continuous, individual spikelets disarticulate above the glumes (*Elymus* and *Agropyron*) or below the glumes (*Hilaria*)
    - 12. Spikelets in groups of 3, spikelet clusters falling entire from a zig-zag rachis below the glumes at maturity; central spikelet fertile, 1-flowered, the 2 lateral spikelets staminate and usually 2-flowered; glumes obtuse to truncate, irregularly lacerate or awned . . . . . **Hilaria**
    - 12. Spikelets 1-2 at each node, the rachis not zig-zag; spikelets all similar, usually 2-many flowered; glumes entire, acute, acuminate, or short-awned
      - 13. Spikelets often strongly divergent, much compressed and crowded, some at least 4 times as long as the internodes of the rachis . . . . . **Agropyron**
      - 13. Spikelets erect or ascending, not much compressed or crowded, mostly 3 times as long as the internodes of the rachis or less . . . . . **Elymus**
  - 11. Rachis disarticulating at maturity with spikelets
    - 14. Spikelets 3 per node, 1-flowered, the lateral pair of spikelets usually pedicellate and reduced, the central one sessile and fertile . . . . . **Hordeum**
    - 14. Spikelets mostly 1-2 per node, or if 3 per node then 2-6 flowered, lateral pair of spikelets like the central one and usually sessile . . . . . **Elymus**

**Group 3: Spikelets flattened and stalked, with one floret**

- 1. Lemma hardened much more than the glumes at maturity, closely enveloping the seed, often without evident nerves, 1 or 3 awns present (sometimes early deciduous), often over 2 cm long
  - 2. Awn of lemma 3-branched . . . . . **Aristida**
  - 2. Awn of lemma unbranched
    - 3. Glumes 2.7-4 mm long; lemmas glabrous . . . . . **Piptatherium**
    - 3. Glumes 4.5-60 mm long; lemmas pubescent (*Stipa, sensu stricto*)
      - 4. Awn deciduous, straight or weakly geniculate, lemma pubescent throughout with hairs 1-4 mm long (*Oryzopsis*) . . . . . **Achnatherum**
      - 4. Awn persistent, usually geniculate, lemma glabrous or short pubescent (hairs less than 1 mm long)
        - 5. Glumes more than 18 mm long
          - 6. Awns with hairs all appressed; ligules finely hairy, 1-5 mm long . . . . . **Hesperostipa comata**
          - 6. Awns with long spreading hairs, ligules mostly a tuft of hairs, less than 0.5 mm long
            - 7. Awns 30-50 mm long, basal segment with spreading hairs over 4.5 mm long (terminal segment without long-spreading hairs); glumes less than 25 mm long . . . . . **Jarava**
            - 7. Awns over 100 mm long, basal and terminal segments with spreading hairs less than 3 mm long; glumes 30-50 mm long . . . . . **Hesperostipa neomexicana**
      - 5. Glumes less than 12 mm long
        - 8. Lemma and palea hardened; palea not completely enclosed within the lemma . . . . . **Piptochaetium**
        - 8. Lemma and palea membranous; palea enclosed within the lemma . . . . . **Achnatherum**
- 1. Lemma usually not hardened, loose around the seed, usually with 1 or more evident nerves, awnless or awns under 2 cm long
  - 9. Glumes (excluding awns) equaling or longer than floret
    - 10. Spikelets disarticulating below the glumes, the entire spikelet falling as one unit; ligules membranous
      - 11. Glumes not awned; lemma awned from the middle . . . . . **Alopecurus**
      - 11. Glumes awn-tipped or long awned; lemmas awnless or awned from the tip between 2 apical teeth
        - 12. Lemmas 0.7-1.5 mm long; anthers 0.4-0.7 mm long; awns of glumes 1-10 mm long . . . . . **Polypogon**
        - 12. Lemmas 1.5-2.5 mm long; anthers 1.1-2.3 mm long; awns of glumes 0.8-1.2 mm long . . . . . **Phleum**
    - 10. Spikelets disarticulating above the glumes, the glumes not falling with the florets; ligules hairy or membranous
      - 13. Glumes abruptly short-awned from an obtuse apex, ciliate on the prominent keel . . . . . **Phleum**
      - 13. Glumes awnless or with awns arising from an acute tip, not prominently keeled
        - 14. Lemmas 1-nerved, awnless . . . . . **Sporobolus**
        - 14. Lemmas 3-5 nerved, awned or awnless
          - 15. Lemma awned from an entire or minutely cleft apex, the body of the lemma 3-nerved . . . . . **Muhlenbergia**

- 15. Lemma awned from the back, well below the apex or awnless, the body of the lemmas usually 5-nerved
- 16. Florets with a tuft of hairs at the base from a callus, hairs at least 1/2 as long as the lemma; palea well-developed; rachilla often prolonged behind the palea and sometimes with a vestigial floret . . . . . *Calamagrostis*
- 16. Florets lacking hairs at base or with very short hairs, less than 1/4 as long as the lemma; palea well-developed or vestigial; rachilla not prolonged behind the palea
- 17. Palea obsolete or a small nerveless scale less than 0.3 mm long and always less than 1/2 the length of the lemma, or if well-developed (0.7-1 mm long and over 1/2 as long as the lemma) then anthers 0.8-1.4 mm long and panicle branches not spikelet-bearing to base . . . . . *Agrostis*
- 17. Palea well-developed, 0.5-1 mm long and over 1/2 as long as the lemma; anthers 0.3-0.7 mm long; panicle branches spikelet-bearing to base . . . . . *Polypogon viridis*
- 9. Glumes (excluding awns) shorter than the floret
- 18. Glumes or lemma awned
- 19. Spikelets disarticulating below the glumes, the spikelets falling in pairs, the lower spikelet sterile; first glume 2-3 awned . . . . . *Lycurus*
- 19. Spikelets disarticulating above the glumes, the spikelets all alike; first glume with a single awn . . . . . *Muhlenbergia*
- 18. Glumes and lemma awnless
- 20. Glumes dissimilar in shape, the first linear, the second broadly oblanceolate to obovate; spikelets disarticulating below the glumes . . . . . *Sphenopholis*
- 20. Glumes similar in shape (although different in size); spikelets disarticulating above the glumes
- 21. Lemma 1-nerved; ligule a tuft of hairs . . . . . *Sporobolus*
- 21. Lemma 3-nerved; ligule membranous (sometimes with a fringe of hairs)
- 22. Nerves of the lemma long, silky-hairy . . . . . *Blepharoneuron*
- 22. Nerves of the lemma glabrous or scabrous, not silky-hairy . . . . . *Muhlenbergia*

**Group 4: Spikelets flattened and stalked, with 2 to many florets; glumes longer than the lowest florets**

- 1. At least one lemma (often many) with a prominent straight or twisted awn and shortly to deeply lobed at the tip
- 2. Lemmas and paleas copiously hairy over lower half, awn straight and short, not much exceeding the floret; spikelets in leafy clusters; plants low, tufted, perennials usually with obvious stolons . . . . . *Erioneuron*
- 2. Lemmas long hairy only at base or lower half or glabrous, paleas glabrous, awns twisted and bent, nearly as long as the floret; spikelets in terminal panicles or racemes; plants annuals or tufted perennials but not stoloniferous
- 3. Perennial; inflorescence a panicle with mostly erect or ascending spikelets, or a raceme if branches are spreading . . . . . *Danthonia*
- 3. Annual; inflorescence a panicle of mostly spreading or drooping spikelets . . . . . *Avena*
- 1. Lemmas all awnless and entire at the tip
- 4. Glumes dissimilar in shape, the first linear, the second broadly oblanceolate to obovate; lemmas 2-3 mm long; spikelets disarticulating below the glumes; rachis glabrous . . . . . *Sphenopholis*
- 4. Glumes similar in shape (but not same size); lemmas 3.2-5.2 mm long; spikelets disarticulating above the glumes; rachis densely short-pubescent . . . . . *Koeleria*

**Group 5: Spikelets flattened and stalked, with 2 to many florets; glumes shorter than the lowest floret**

- 1. Plants reed-like and 2-10 m tall; panicles 15-60 cm long
- 2. Leaf blades 15-40 cm long, without a brown wedge-shaped area at the base; lemmas glabrous; rachilla with long spreading hairs that exceed the lemma . . . . . *Phragmites*
- 2. Leaf blades 30-100 cm long, with a brown wedge-shaped area at the base; lemmas hairy; rachilla glabrous . . . . . *Arundo*
- 1. Plants not reed-like and typically less than 2 m tall; panicles less than 40 cm long
- 3. Lemmas with an awn more than 0.5 mm long
- 4. Plants mat-forming, stoloniferous annuals; inflorescence a small, head-like cluster obscured by subtending leaf clusters; lemmas ciliate on margins, glabrous on back; leaf blades with narrow white margins, flat, 1-3 mm wide . . . . . *Munroa*
- 4. Plants erect perennial or annuals, tufted, rhizomatous, or occasionally stoloniferous; inflorescence an open panicle or if head-like, heads borne well above leaves or back of lemmas densely pubescent; leaf blades involute, or if flat then wider than 3 mm or without narrow white margins
- 5. Plants perennial
- 6. Inflorescence an open, elongated panicle, individual spikelets on elongate pedicels (sometimes nearly sessile in *Festuca*)
- 7. Lemmas long-tapering to the awn tip; spikelets 5-7 mm long; leaves narrowly involute . . . . . *Festuca*

- 7. Lemmas with a minute bi-forked tip, awn attached below the tip; spikelets 17-30 mm long; leaves narrow or broad and flat ..... **Bromus**
- 6. Inflorescence head-like, individual spikelets 5-10 mm long and sessile or on short pedicels
  - 8. Spikelets in dense, 1-sided clusters at the tips of otherwise naked branches; lemmas pubescent on upper half; awn arises from tip; culms over 30 cm tall ..... **Dactylis**
  - 8. Spikelets in leafy or leafless terminal clusters; lemmas pubescent on lower half; awn arises from a bifid apex; culms less than 20 cm tall ..... **Erioneuron**
- 5. Plants annual
  - 9. Lemmas awned from a bifid apex, (4) 5-60 mm long; lemmas 7-30 mm long ..... **Bromus**
  - 9. Lemmas awned from the tip, 0.5-5 mm long; lemmas 3-5 mm long ..... **Vulpia**
- 3. Lemmas awnless or with an awn tip less than 0.5 mm long
  - 10. Pedicels hair-like, much longer than the spikelets, inflorescence an open, much-branched panicle ..... **Muhlenbergia asperifolia**
  - 10. Pedicels stout, not hair-like and equal to much shorter than spikelets; inflorescence a raceme, panicle, or spike with appressed or closely ascending branches
    - 11. Glumes dissimilar in shape, the first linear, the second broadly oblanceolate to obovate; spikelets disarticulating below the glumes ..... **Sphenopholis**
    - 11. Glumes similar in shape (although they may differ in size); spikelets disarticulating above the glumes
      - 12. Ligules ciliate or hair-like throughout; collar with long hairs
        - 13. Plants dioecious, rhizomatous perennials; base of stems with numerous overlapping scales ... **Distichlis**
        - 13. Plants not dioecious, tufted annuals or perennials; base of stems without overlapping scales ..... **Eragrostis**
  - 12. Ligules membranous, sometimes with fine cilia only on margin; collars usually without long hairs
    - 14. Lemmas keeled on the back
      - 15. Lemmas greatly exceed glumes, blunt to acute at tip; inflorescence an open or contracted panicle; plants annual or perennial; rachis glabrous or scabrous but not densely short hairy; lemmas often with a tuft of cobwebby hairs at base or with long hairs on the nerves ..... **Poa**
      - 15. Lemmas subequal to glumes, sharply acute at tip; inflorescence a contracted spike-like panicle; plants perennial; rachis densely short hairy; lemmas lacking cobwebby hairs at base, short pubescent or scabrous on nerves and between nerves ..... **Koeleria**
  - 14. Lemmas rounded on the back
    - 16. Lemmas obtuse and scarious at tip, 1.4-3 mm long; nerves of the lemma either obscure or if well developed tending to be parallel and not converging towards the tip
      - 17. Florets 2-flowered; lemmas prominently 3-nerved and truncate at tip; glumes erose at tip ..... **Catabrosa**
      - 17. Florets 3-7 flowered; lemmas with obscure nerves or prominently 5-7 nerved and obtuse at tip; glumes not erose at tip
        - 18. Nerves of the lemma obscure; leaf sheaths usually open ..... **Puccinellia**
        - 18. Nerves of the lemma prominent; leaf sheaths usually closed ..... **Glyceria**
- 16. Lemmas mostly acute to pointed at the tip, over 5.5 mm long; nerves of the lemma distinct and converging toward the summit
  - 19. Leaf blades 0.5-2.5 mm wide and strongly involute; lemmas 3-6 mm long ..... **Poa secunda**
  - 19. Leaf blades 2-5 mm wide and involute to flat; lemmas 5.5-9 mm long
    - 20. Leaf blades flat, ligules 0.2 mm long, auricles present; base of culms not onion-like ..... **Festuca**
    - 20. Leaf blades mostly involute, ligules 2-6 mm long, auricles lacking; base of culm below ground onion-like ..... **Melica**

**Achnatherum** (Needlegrass, Ricegrass)

See also *Hesperostipa*, *Jarava*, & *Piptochaetium*

- 1. Awn deciduous, straight or weakly geniculate, lemma pubescent throughout with hairs 1-4 mm long
  - 2. Panicle branches and pedicels widely spreading; awn of lemma 3-5.5 mm long ..... **A. hymenoides** (Roem. & Schult.) Barkworth (Indian ricegrass) C3 PerGram, bunchgrass, common in warm desert shrub, mountain shrub, pinyon-juniper, Ponderosa pine/Douglas-fir, and sagebrush grassland, May-Aug (*Oryzopsis hymenoides*, *Stipa hymenoides*).
  - 2. Panicle branches and pedicels erect or ascending; awn of lemma 7-18 mm long ..... **A. x bloomeri** (Bol.) Barkworth (Bloomer's ricegrass) C3 PerGram bunchgrass, rare in desert shrub, mountain shrub, pinyon-juniper, and sagebrush grassland, Jun-Aug; hybrid between *A. hymenoides* and other *Achnatherum* spp. (*Oryzopsis bloomeri*, *Stipa x bloomeri*, x *Stiporyzopsis bloomeri*). *Achnatherum arnowiae* (Welsh & Atwood) Barkworth might be sought in Zion NP. It differs in having pubescent lemmas (on the veins) and awns 3-6 mm long (vs. glabrous lemmas and awns over 7 mm long in *A. x bloomeri*).

1. Awn persistent, usually geniculate, lemma glabrous or short pubescent (hairs less than 1 mm long)
3. Lemma densely white-hairy throughout with hairs 1-4 mm long . . . . . **A. pinetorum** (Jones) Barkworth (Pine needlegrass) PerGram bunchgrass; Reported by Ott (2010), sagebrush & montane conifer, June-Aug (*Stipa pinetorum*).
3. Lemma unequally hairy, with long hairs at tip of lemma and short hairs over the rest of the body, these less than 1 mm long
4. Lemma 5.5-7.2 mm long, awns 20-50 mm long; palea about 1/2 as long as the lemma . . . . . **A. nelsonii** (Scribn.) Barkworth **var. nelsonii** (Nelson's needlegrass) C3 PerGram bunch, uncom in montane grassland and shrub, Jun-Sep (*Stipa nelsonii* var. *nelsonii*).
4. Lemma 4.5-6 mm long, awns 10-22 mm long; palea at least 2/3 as long as the lemma . . . . . **A. lettermanii** (Vasey) Barkworth (Letterman's needlegrass) C3 PerGram bunchgrass, common in montane grassland and shrub communities, Jul-Sep (*Stipa lettermanii*).

**Aegilops** (Goatgrass)

**A. cylindrica** Host (Jointed goatgrass) C3 AnnGram; Native to Eurasia), uncom in disturbed areas, May-June.

**Agropyron** (Wheatgrass)

**A. cristatum** (L.) Gaertner (Crested wheatgrass) C3 PerGram bunchgrass, exotic (native to Eurasia), uncom in disturbed areas, often planted in range seedings, Jun-Aug.

**Agrostis** (Bentgrass)

1. Palea evident, usually 2-nerved, about half as long as the lemma; rhizomatous
2. Lemma 0.8-1.2 mm long; anthers 0.3-0.5 mm long; panicles a condensed and interrupted spike with branchlets bearing spikelets to the base . . . . . see **Polypogon viridis**
2. Lemma 1.4-1.8 mm long; anthers 0.8-1.4 mm long; panicle often open with spreading branches that do not bear spikelets to the base . . . . . **A. stolonifera** L. (Redtop bentgrass) C3 rhizomatous PerGram, exotic (native to Eurasia and Africa), common in riparian areas, Jun-Sep.
1. Palea lacking or a minute, nerveless scale; bunchgrasses
3. Panicle contracted at maturity, at least some lower branches bearing spikelets near the base . . . . . **A. exarata** Trin. (Spike bentgrass) C3 PerGram bunchgrass, uncom in riparian areas in Navajo Sandstone canyons, Jul-Aug.
3. Panicle open at maturity, lower branches not bearing spikelets near the base . . . . . **A. scabra** Willd. (Ticklegrass) C3 PerGram bunchgrass, uncom in sandy seepage areas, Jul-Aug.

**Alopecurus** (Foxtail)

**A. aequalis** Sobol. (Shortawn foxtail) C3 PerGram bunchgrass, rare in wetlands, Jun-Aug.

**Andropogon** (Bluestem)

1. Hairs of rachis segments 3-4 mm long, dense, often yellowish; plants with well-developed rhizomes . . . . . **A. hallii** Hack. (Hall's bluestem) C4 rhizomatous PerGram, uncom in riparian areas and sandstone ledges, Jul-Sep (*A. gerardii* var. *chrysocomus*).
1. Hairs of rachis segments 1-2 mm long, relatively sparse, usually white; plants with short rhizomes or tufted . . . . . **A. gerardii** Vit. (Big bluestem) C4 PerGram bunchgrass, uncom in riparian areas and sandstone ledges, Jul-Sep.

**Aristida** (Three-awn)

**A. purpurea** Nutt.

1. Awns 40-140 mm or more long and 0.2-0.5 mm thick at the base; leaves at base or along stem . . . . . **var. longiseta** (Steud.) Vasey (Red three-awn), C4 PerGram bunchgrass, collected by K. Weight along Emerald Pool Trail in 1935.
1. Awns 15-40 mm long and 0.1-0.3 mm thick at base; leaves usually all basal
2. Tip of lemma 0.1 mm wide; awns about 0.1 mm thick at base . . . . . **var. nealleyi** (Vasey) Allred (Nealley's three-awn) C4 PerGram bunchgrass, collected by Walter Cottam along Narrows Trail in Zion Canyon in 1935.
2. Tip of lemma 0.2-0.3 mm wide; awns 0.2-0.3 mm thick at base . . . . . **var. fendleriana** (Steud.) Vasey (Purple three-awn) C4 PerGram bunchgrass, uncom in disturbed areas, pinyon-juniper woodlands, and sagebrush, Apr-Sep.



**Arundo** (Giant reed)

**A. donax** L. (Giant reed) C3 PerGram bunchgrass, uncom in wetlands, native to Eurasia.

**Avena** (Oats)

**A. fatua** L.

1. Awn straight or absent; lemmas glabrous; spikelets usually with 2 flowers . . . . . **var. sativa** (L.) Hausskn. (Oats) C3 AnnGram, introduced from Eurasia, uncom in sandy, disturbed soil in Oak Creek drainage, Jun-Aug.
1. Awn bent; lemmas hairy; spikelets usually with 3 flowers . . . . . **var. fatua** (Oats) C3 AnnGram, exotic, rare in disturbed areas, introduced from Eurasia, May-Aug.

**Blepharoneuron** (Pine dropseed)

**B. tricholepis** (Torr.) Nash (Pine dropseed) C4 PerGram bunchgrass, uncom in riparian and meadows, Jul-Sep.

**Bothriochloa** (Bluestem)

1. Sessile spikelets (4) 5-7.3 mm long; awns 15-30 mm long . . . . . **B. barbinodis** (Lag.) Herter (Cane bluestem) C4 PerGram bunchgrass, uncom in rocky areas, Apr-Nov.
1. Sessile spikelets 2.5-4.5 mm long; awns 8-18 mm long . . . . . **B. laguroides** (DC.) Herter **ssp. torreyana** (Steud.) Allred & Gould (Silver bluestem) C4 PerGram bunchgrass, uncom in sandy or disturbed areas, Aug-Sep.

**Bouteloua** (Gramma)

1. Plants annual . . . . . **B. barbata** Lag. **var. barbata** (Sixweeks grama) C4 AnnGram, uncom in desert shrub and disturbed areas, Aug-Sep. (*Chondrosium barbatum*).
1. Plants perennial
  2. Inflorescence of 10-50 spikes, each spike with 1-5 spikelets (rarely 10), entire spike disarticulating at maturity, spikes reflexed or spreading
    3. Spikes with 2-5 (10) spikelets; lemma 3.8-6 mm long . . . . . **B. curtipendula** (Michx.) Gray (Sideoats grama) C4 PerGram bunch, uncom in grassland and pinyon-juniper, Jul-Sep.
    3. Spikes with 1 or rarely 2 spikelets; lemma 6-7.5 mm long . . . . . **B. uniflora** Vasey (One-flower grama) C4 PerGram, Historic, Jul-Sep.
  2. Inflorescence of 8 or fewer spikes, each spike with 10-80 spikelets, florets disarticulating from the persistent glumes at maturity, spikes erect to ascending
    4. Lower internodes densely white-woolly . . . . . **B. eriopoda** (Torr.) Torr. (Black grama) C4 rhizomatous PerGram, rare in wash bottoms and rocky slopes, Jun-Aug (*Chondrosium eriopodum*).
    4. Lower internodes glabrous or scabrous but not white-woolly
      5. Callus of sterile lemma densely bearded; rachis of flowering spike does not project beyond the last spikelet, common . . . . . **B. gracilis** (H.B.K.) Lag. ex Steud. (Blue grama) C4 rhizomatous PerGram, uncom in desert shrub, grassland/meadow, pinyon-juniper, Ponderosa pine/Douglas-fir, sagebrush grasslands, Jul-Sep. (*Chondrosium gracile*).
      5. Callus of sterile lemma glabrous; rachis of flowering spike extends as a needle-like projection well beyond the last spikelet, rare in Zion, known only from historical records . . . . . **B. hirsuta** Lag. (Hairy grama) C4 rhizomatous PerGram, Historic, in pinyon-juniper, Jul-Aug (*Chondrosium hirsutum*).

**Bromus** (Brome)

1. Lemmas with awns averaging at least 10 mm long; plants annual
  2. Awns of the lemma 30-60 mm long; first glume 13-25 mm long . . . . . **B. diandrus** Roth (Ripgut brome) C3 AnnGram, introduced from Eurasia, common in disturbed areas in Zion Canyon, Apr-Jun.
  2. Awns of the lemma averaging less than 30 mm long; first glume averaging less than 13 mm
    3. Lemmas diamond-shaped on dorsal side; first glume 3-5 nerved . . . . . **B. japonicus** Thunb. (Japanese brome) C3 AnnGram, exotic (native to Eurasia), uncom in disturbed areas & riparian, Jun-Aug.
    3. Lemmas oval to elliptic on dorsal side; first glume 1 nerved
      4. Awns strongly bent and twisted near base; second glume as long as the lowest lemma . . . . . **B. trinii** Desv. (Chilean chess) C3 AnnGram, uncom in disturbed areas, introduced from South America, Apr-May.
      4. Awns not strongly bent or twisted near the base; second glume shorter than the lowest lemma
        5. Panicles dense, branches erect; apical teeth of lemma 4-5 mm long . . . . . **B. rubens** L. (Red brome) C3 AnnGram, exotic (native to Eurasia), uncom in blackbrush and desert shrub, Mar-Jun.
        5. Panicles loose, branches nodding; apical teeth of lemma 1-3 mm long . . . . . **B. tectorum** L. (Cheatgrass) C3 AnnGram, introduced from Eurasia, com usually in disturbed areas across Zion, Mar-Jun.

1. Lemmas awnless or with awns averaging less than 10 mm long; plants perennial or annual
6. Spikelets strongly compressed, the glumes and lemmas sharply keeled at anthesis
  7. Lemmas awnless or with awns less than 3 mm long; annual . . . . . **B. catharticus** Vahl  
(Rescue grass) C3 AnnGram, introduced from South America, uncom in weedy areas, Mar-Jun.
  7. Lemmas with awns 3-8 mm long; perennial . . . . . **B. carinatus** Hook. & Arnot  
(California brome) C3 PerGram bunch, uncom in aspen, grassland/ meadow, mountain shrub, Ponderosa pine/  
Douglas-fir, and sagebrush grasslands, May-Aug (*B. marginatus*).
6. Spikelets terete to moderately flattened but not compressed, the glumes and lemmas rounded on the back
  8. Plants taprooted annuals (occasionally biennial); second glume 5-7 nerved . . . . . **B. japonicus** Thunb.  
(see couplet 2)
  8. Plants perennials; second glume 3-nerved, or if 5 nerved plants rhizomatous
    9. Plants rhizomatous; lemmas glabrous or obscurely fine hairy; awns lacking; panicle branches mostly erect or  
ascending . . . . . **B. inermis** Leysser  
(Smooth brome) C3 rhizomatous PerGram, exotic (native to Eurasia), common in grassland/meadow,  
mountain shrub, pinyon-juniper, Ponderosa pine/Douglas-fir, and riparian, formerly widely planted as a  
pasture grass, Jun-Aug.
    9. Plants not rhizomatous; lemmas long-hairy; awns 1-6 mm long; panicle branches drooping
      10. Lemmas with hairs primarily on the margins; glumes glabrous or with scabrous nerves, the first glume  
usually only 1-nerved; leaves 4-13 mm wide . . . . . **B. ciliatus** L.  
(Fringed brome) C3 PerGram bunch, uncom in montane aspen, grassland/meadow, & Ponderosa pine/  
Douglas-fir woods, Jul-Sep.
      10. Lemmas with hairs uniformly on margins and across the back; glumes often pubescent, the first glume  
mainly 3-nerved; leaves 2-5 mm wide . . . . . **B. porteri** Coult. & Nash  
(Nodding brome) C3 PerGram bunch, uncom in montane and riparian habitats, Jun-Aug. Formerly treated  
as *B. anomalus* Rupr. ex Fourn., but this species is restricted to western Texas and adjacent Mexico according  
to Barkworth et al. (2007).

**Buchloe** (Buffalograss)

**B. dactyloides** (Nutt.) Engelm. (Buffalograss) C4 rhizomatous PerGram, uncom in Watchman Campground,  
probably escaped from cultivation (*Bouteloua dactyloides*) Jul-Sep.

**Calamagrostis** (Reedgrass)

**C. scopulorum** Jones (Jones reedgrass) C3 rhizomatous PerGram, uncom in hanging garden and riparian areas,  
Jul-Aug. The type locality is from Springdale, UT.

**Catabrosa** (Brookgrass)

**C. aquatica** (L.) Beauv. (Brookgrass) C3 rhizomatous PerGram, uncom in riparian habitats, Jun-Sep.

**Cenchrus** (Sandbur)

**C. longispinus** (Hack.) Fernald (Field sandbur) C4 AnnGram, uncom in sandy disturbed sites, Jul-Sep.

**Chloris** (Fingergrass)

**C. virgata** Swartz (Feather fingergrass) C4 AnnGram, uncom in sandy disturbed or riparian areas, Aug-Sep.

**Cynodon** (Bermuda grass)

**C. dactylon** (L.) Pers. (Bermuda grass) C4 rhizomatous PerGram, exotic (native to Africa) and a Utah state noxious  
weed, uncom in disturbed and riparian areas, May-Sep.

**Dactylis** (Orchard grass)

**D. glomerata** L. (Orchard grass) C3 PerGram bunch, exotic (native to Eurasia and Africa), uncom in meadows,  
Jun-Aug.

**Danthonia** (Oatgrass)

**D. intermedia** Vasey (Timber oatgrass) PerGram bunchgrass, uncom in montane meadow areas, Jul-Aug.

**Digitaria** (Crabgrass)

**D. sanguinalis** (L.) Scop. (Hairy crabgrass) C4 AnnGram, exotic (native to Eurasia), uncom in disturbed sites, Jul-  
Sep.

**Distichlis** (Saltgrass)

**D. spicata** (L.) Greene (Desert saltgrass) C4 rhizomatous PerGram, desert riparian areas in SW corner of park, Jun-Jun-Sep.

**Echinochloa** (Barnyard grass)

1. Tip of upper lemma gradually tapers to a pointed, thickened tip, ring of hairs absent; lower lemma awnless or with an awn to 10 mm long . . . . . **E. muricata** (Beauv.) Fernald **var. microstachya** Wiegand (American barnyard grass) C4 AnnGram; native to North America; rare in wet ditches in campgrounds, Jul-Sep.
1. Tip of upper lemma rounded and with a ring of short hairs, abruptly forming a triangular, thickened tip; lower lemma awnless or with an awn to 50 mm . . . . . **Echinochloa crusgalli** (L.) Beauv. (Barnyard grass) C4 AnnGram, exotic (native to Eurasia), uncom in riparian and disturbed areas, Jul-Sep.

**Eleusine** (Goosegrass)

**E. indica** (L.) Gaertner (Goosegrass) C4 AnnGram, exotic (native to tropical Asia), uncom in disturbed areas, Jul-Oct.

**Elymus** (Wildrye, Wheatgrass)

1. Glumes slender, needle-like, 1-nerved or not nerved; spikelets mostly 2 or more per node, at least at middle of spike
  2. Lemmas acute but not awned; rachis not readily disarticulating; plants forming dense tufts with culms more than 70 cm tall . . . . . **E. cinereus** Scribn. & Merr. (Great Basin wildrye) C3 PerGram bunchgrass, Reported by Welsh (1995), montane conifer & wetland areas, Jun-Aug (*Leymus cinereus*).
  2. Lemmas with elongate awns; rachis readily disarticulating (breaking into 1-3 spikelet segments) at maturity; plants tufted but culms only 10-45 cm tall
    3. Glumes slender and awn-like throughout, spikelets often appearing to have 3-6 glumes due to extreme reduction of florets; inflorescence broad and bristly or bottlebrush-like at maturity . . . . . **E. elymoides** (Raf.) Swezey (Squirreltail) C3 PerGram bunchgrass, common in warm desert, grassland/meadow, mountain shrub, pinyon-juniper, Ponderosa pine/Douglas-fir, riparian, and disturbed sites, May-Aug, (*Sitanion hystrix*).
    3. Glumes awned at tip but wide at base; spikelets not appearing to have extra glumes; inflorescence narrow and spike-like at maturity, not bottlebrush-like . . . . . **E. x macounii** Vasey (Macoun's wheatgrass) C3 PerGram bunchgrass, uncom in pinyon-juniper and sagebrush, Jun-Aug. Hybrid between *Elymus trachycaulus* and *Hordeum jubatum*.
1. Glumes lanceolate to elliptic, 3-7 nerved; spikelets 1-2 per node
  4. Creeping rhizomes present
    5. Glumes and lower lemmas blunt at tip (sometimes with a short cusp-like tooth at tip) . . . . . **E. hispidus** (Opiz) Meld. (Intermediate wheatgrass) C3 rhizomatous PerGram, introduced from Eurasia, disturbed areas, Jun-Aug (*Agropyron intermedium*, *Elytrigia intermedia*, *Thinopyrum intermedium*).
    5. Glumes and lemmas gradually tapering to a sharp-pointed tip
      6. Leaf blades mostly flat, some 5-10 mm wide, typically dark green . . . . . **E. repens** (L.) Gould (Quackgrass) C3 rhizomatous PerGram, exotic, grassland/meadow, mountain shrub, riparian, urban/agriculture, introduced from Eurasia, Jun-Aug (*Elytrigia repens*, *Agropyron repens*).
      6. Leaf blades involute or less than 5 mm wide; typically glaucous . . . **E. lanceolatus** (Scribn. & Smith) Gould (Thickspike wheatgrass) C3 rhizomatous PerGram, aspen, grassland/meadow, mountain shrub, pinyon-juniper, sagebrush grassland, urban/agriculture, Jun-Aug (*Elytrigia dasystachya*, *Agropyron dasystachyum*).
  4. Creeping rhizomes not present
    7. Spikelets mostly 2 or more per node, at least at middle of spike
      8. Glumes awnless or with awns 1-5 mm long; lemmas glabrous to minutely scabrous, awns 1-30 mm long; spikes erect . . . . . **E. glaucus** Buckl. (Blue wildrye) C3 PerGram bunchgrass, uncom, montane conifer woodlands, Jul-Aug.
      8. Glumes with awns 5-20 mm long; lemmas short hairy or rarely scabrous, with awns 10-40 mm long; spikes drooping to nodding . . . . . **E. canadensis** L. (Canada wildrye) C3 PerGram bunchgrass, uncom in riparian areas, Jul-Aug.
    7. Spikelets 1 per node

9. Glumes and lower lemmas blunt at tip (sometimes with a short cusp-like tooth at tip) . . . . . **E. elongatus** (Host) Runem.  
 (Tall wheatgrass) C3 perennial bunchgrass, exotic (native to Eurasia), uncom in disturbed areas, Jun-Aug  
 (*Agropyron elongatum*, *Thinopyrum ponticum*).
9. Glumes and lemmas gradually tapering to a sharp-pointed tip
10. Anthers 4-6 mm long; spikelets shorter to slightly longer than the internodes of the rachis; lemmas usually with a divergent awn, rarely awnless or with a short, straight awn . . . . . **E. spicatus** (Pursh) Gould  
 (Bluebunch wheatgrass) C3 PerGram bunch, aspen, mountain shrub, pinyon-juniper, Ponderosa pine/  
 Douglas-fir, sagebrush grassland, Jun-Aug (*Agropyron spicatum*, *Pseudoroegneria spicata*).
10. Anthers 1-3 mm long; spikelets 2-3 times longer than the internodes of the rachis; lemmas with a short straight awn . . . . . **E. trachycaulus** (Link) Gould ex Shinners  
 (Slender wheatgrass) C3 PerGram bunch, aspen, grassland/meadow, mountain shrub, Ponderosa pine/  
 Douglas-fir, sagebrush grassland, Jun-Aug (*Agropyron trachycaulum*, *A. caninum*).

**Eragrostis** (Lovegrass)

1. Plants perennial; culms 45-75 cm tall; spikelets 0.8-1 mm wide . . . . . **E. lehmanniana** Nees  
 (Lehmann's lovegrass) C4 PerGram bunch, exotic (native to Africa), disturbed areas, Jul-Sep.
1. Plants annual; culms 10-60 cm tall; spikelets 1.2- 3 mm wide
2. Crater-like glands present on the panicle branches and often on the keels of the lemmas; spikelets 2-3 mm wide at middle, comprised of 7-40 florets . . . . . **E. cilianensis** (All.) Mosher  
 (Stinkgrass) C4 AnnGram, exotic (native to Eurasia), disturbed areas, Jul-Sep.
2. Glands not present on panicle branches or keels of the lemmas; spikelets 1.2-2.5 mm wide at middle, comprised of 5-20 florets . . . . . **E. pectinacea** (Michx.) Nees  
 (Tufted lovegrass) C4 AnnGram, disturbed areas, Jul-Aug.

**Erioneuron** (Tridens)

1. Panicles on long, leafless stems above the basal rosette; glumes much shorter than the spikelet; lemmas 4-7.5 mm long, not deeply cleft at tip . . . . . **E. pilosum** (Buckl.) Nash in Small  
 (Hairy tridens) PerGram, reported by Ott (2010), pinyon-juniper & oak, May-Jul.
1. Panicles embedded within a cluster of leaves; glumes as long as the spikelet or nearly so; lemmas 2.5-5 mm long, deeply cleft at tip (*Dasyochloa*) . . . . . **E. pulchellum** (H.B.K.) Tateoka  
 (Fluffgrass) C4 rhizomatous PerGram, desert shrub, Apr-Aug (*Dasyochloa pulchella*).

**Festuca** (Fescue)

See also *Vulpia*

1. Leaf blades involute, or if flat less than 1.5 mm wide, largest leaves in a basal rosette; collars without ear-like auricles; stems usually less than 35 cm . . . . . **F. ovina** L. var. **saximontana** Gleason  
 (Sheep fescue) C3 PerGram bunch, uncom in mountain brush, Ponderosa pine/Douglas-fir, Jun-Aug (*F. ovina* var. *rydbergii*, *F. saximontana*).
1. Leaf blades flat, usually more than 3 mm wide, largest leaves along stem; collars with auricles; stems well over 35 cm tall
2. Lemmas 7-10 mm long; first glume 4-6 mm long; auricles typically ciliate . . . . . **F. arundinacea** Schreb.  
 (Tall fescue) C3 PerGram bunch, exotic (native to Europe), desert shrub and grassland/meadow, May-Jul  
 (*Schedonorus arundinaceus*, *S. phoenix*).
2. Lemmas 4-7 mm long; first glume 2.5-4 mm long; auricles typically glabrous . . . . . **F. pratensis** Huds.  
 (Meadow fescue) C3 PerGram bunchgrass, exotic (native to Eurasia), uncom in montane meadow and riparian areas, Jun-Aug (*Lolium pratense*, *Schedonorus pratensis*).

**Glyceria** (Mannagrass)

**G. striata** (Lam.) A.S. Hitchc. (Fowl mannagrass) C3 rhizomatous PerGram, uncom in wetlands, Jul-Aug.

**Hesperostipa** (Needlegrass, Needle-and-thread) formerly in *Stipa*

See *Achnatherum*, *Jarava*, & *Piptochaetium*

1. Awns with hairs all appressed; ligules finely hairy, 1-5 mm long . . . . . **H. comata** (Trin. & Rupr.) Barkworth var. **comata**  
 (Needle-and-thread) C3 PerGram bunchgrass, common in warm desert shrub, sagebrush, & montane grassland and forests, May-Jul (*Stipa comata* var. *comata*).
1. Awns with long spreading hairs, ligules mostly a tuft of hairs, less than 0.5 mm long . . . . . **H. neomexicana** (Thurb.) Barkworth  
 (New Mexico feathergrass) PerGram bunchgrass; Reported by Ott (2010), warm desert & pinyon-juniper, May-Jun (*Stipa neomexicana*).

**Hilaria** (Galleta)

1. Culms and leaves glabrous to sparsely pubescent with small, hirsute hairs; culms typically under 45 cm tall . . . . . **H. jamesii** (Torr.) Benth. (Galleta) C4 rhizomatous PerGram, common in desert shrub, pinyon-juniper, sagebrush grassland, May-Aug (*Pleuraphis jamesii*).
1. Culms and leaves densely woolly pubescent; culms typically over 50 cm tall . . . . . **H. rigida** (Thurber) Benth. ex Scrib. (Big galleta) C4 rhizomatous PerGram, uncom, warm desert creosote bush and blackbrush, Mar-Jun (*Pleuraphis rigida*).

**Hordeum** (Foxtail, Barley)

1. Glumes of at least the central spikelet ciliate, the hairs to ca 1 mm long; lateral spikelets about equal to or longer than the central spikelet . . . . . **H. murinum** L. (Rabbit barley) C3 AnnGram, exotic (native to Europe), uncom in sagebrush and disturbed areas, Mar-Jun (*Hordeum leporinum*, *Critesion glaucum*).
1. Glumes not ciliate; lateral spikelets typically smaller than the central spikelet
  2. Glumes 30-100 mm long, widely spreading at maturity; spike at maturity 4-15 cm wide (including the awns) . . . . . **H. jubatum** L. (Foxtail barley) C3 PerGram bunch, uncom in warm desert, montane grassland, pinyon-juniper, montane forest, and disturbed areas, Jun-Aug (*Critesion jubatum*).
  2. Glumes 6-26 mm long, mostly ascending; spike at maturity 3 cm or less wide (including the awns)
    3. Plants perennial; awn of the central lemma 2-10 mm long . . . . . **H. brachyantherum** Nevski (Meadow barley) C3 PerGram bunchgrass, uncom in montane and riparian areas, Jun-Aug (*Critesion brachyantherum*).
    3. Plants annual; awn of the central lemma 8-20 mm long . . . . . **H. pusillum** Nutt. (Little barley) C3 AnnGram, uncom in warm desert and sagebrush habitats, May-Aug (*Critesion pusillum*).

**Jarava** (Desert needlegrass) formerly in *Stipa*

- J. speciosa** (Trin. & Rupr.) Peñail. (Desert needlegrass) C3 PerGram bunchgrass, uncom in barren slickrock, desert shrub, pinyon-juniper, and sagebrush grassland, Apr-Jun. (*Achnatherum speciosum*, *Stipa speciosa*).

**Koeleria** (Junegrass)

- K. macrantha** (Ledeb.) Schultes (Junegrass) C3 PerGram bunch, uncom in pinyon/juniper & montane forests, Jun-Aug (*Koeleria cristata*, *K. nitida*).

**Lycurus** (Wolftail)

- L. phleoides** H.B.K. (Wolftail) C4 PerGram bunch, uncom in barren slickrock, Jun-Aug. (*L. setosus*).

**Melica** (Onion grass)

- M. bulbosa** Geyer ex Porter & Coulter (Oniongrass) C3 PerGram bunchgrass, uncom in montane woodlands, Jun-Aug.

**Muhlenbergia** (Muhly)

1. Plants with well-developed rhizomes, these usually scaly, creeping, and often branched
  2. Panicles open at maturity; pedicels much longer than the spikelets
    3. Glumes awnless, 0.7-2 mm long; lemma only slightly longer than the glumes; leaves flat or folded, not sharp-pointed . . . . . **M. asperifolia** (Nees & Meyen) Parodi (Scratchgrass) C4 rhizomatous PerGram, uncom in riparian areas, Jun-Aug.
    3. Glumes short-awned, 1.5-3 mm long; lemma nearly twice as long as the glumes; leaves involute, sharp-pointed . . . . . **M. pungens** Thurb. in Gray (Sandhill muhly) C4 rhizomatous PerGram, uncom in sandy desert shrub, pinyon-juniper, and sagebrush grasslands, Jul-Sep.
  2. Panicles narrow; pedicels shorter than the spikelets
    4. Leaf blades mostly more than 3 mm broad, flat; lemma as long as or shorter than the glumes; anthers 0.4-0.8 mm long
    5. Callus at base of lemma with hairs 2-2.7 mm long, subequal to the lemma; awn of lemma 2.5-8 mm long . . . . . **M. andina** (Nutt.) A.S. Hitchc. (Foxtail muhly) C4 rhizomatous PerGram, uncom in riparian areas, Jul-Aug.
    5. Callus a base of lemma with hairs 0.7-1.5 mm long, less than 1/2 as long as the lemma; lemma awnless or awn under 1 mm long . . . . . **M. racemosa** (Michx.) Britt., Sterns, & Pog. (Green muhly) C4 rhizomatous PerGram, uncom in riparian areas, Jul-Sep.

4. Leaf blades 2 mm broad or less, usually involute; lemma about twice as long as the glumes (except in *M. thurberi*); anthers 1-2.7 mm long
6. Lemma awnless or awn less than 0.3 mm long; florets glabrous . . . . . ***M. richardsonis*** (Trin.) Rydb. (Mat muhly) C4 rhizomatous PerGram, Reported by Welsh (1995), montane woodlands, Jul-Sep.
6. Lemma with an awn 0.7-20 mm long; florets pubescent or glabrous
7. Awn of lemma 5-20 mm long; lemma glabrous to short pubescent with hairs less than 0.5 mm, short tuft of hairs may also be present on callus at base of lemma . . . . . ***M. pauciflora*** Buckl. (New Mexican muhly) C4 rhizomatous/bunch PerGram, uncom in desert shrub, pinyon-juniper, and montane grasslands, Aug-Sep (includes *M. arsenei*). *M. arsenei* A.S. Hitchc. differs in having glumes without long awns and is not reported for Utah in FNA.
7. Awn of lemma 0.7-3 mm long; lemma villous with hairs to 1.5 mm long; callus naked . ***M. thurberi*** Rydb. (Thurber's muhly) C4 rhizomatous PerGram, uncom in desert shrub, pinyon juniper, & wetlands, Jul-Sep.
1. Plants without rhizomes, culms tufted or short-spreading
8. Second glume 3-toothed; ligule 4-20 mm long, acuminate at tip . . . . . ***M. montana*** (Nutt.) A.S. Hitchc. (Mountain muhly) C4 PerGram bunchgrass, rare in montane forests, Jul-Sep.
8. Second glume not 3-toothed; ligule 1-5 mm long, truncate at tip
9. Panicle open, branches with flowers only at the tips . . . . . ***M. porteri*** Scribn. ex Beal (Bush muhly) C4 PerGram bunch, uncom in desert shrub, Jul-Sep.
9. Panicle narrow or congested, branches flowered all the way to the base . . . . . ***M. pauciflora*** Buckl. (see couplet 7 for full data).

***Munroa*** (False buffalograss)

***M. squarrosa*** (Nutt.) Torr. (False buffalograss) C4 AnnGram, uncom in desert shrub, pinyon-juniper, sagebrush grassland, and disturbed areas, Jun-Sep (*Monroa squarrosa*).

***Panicum*** (Panic grass)

Includes *Dichantherium* from FNA

1. Glumes glabrous or scabrous, but not hairy; plants tufted annual (*Panicum*). . . . . ***P. capillare*** L. (Witchgrass) C4 AnnGram, uncom in warm desert, sagebrush, and wetlands, Jun-Sep.
1. Glumes pubescent; plants perennial (*Dichantherium*)
2. Spikelets 0.8-2.5 mm long; hairs of the ligule 1.5-5 mm long . . . . . ***P. acuminatum*** Swartz (Bundle panic) C4 PerGram bunch, uncom in hanging gardens & wetlands, Jun-Sep (*Dichantherium acuminatum*).
2. Spikelets 2.5-4 mm long; hairs of the ligule 0.5-1.4 mm long . . . . . ***P. oligosanthos*** Schultes (Scribner's panicgrass) C4 PerGram bunch, uncom in hanging garden, riparian, and montane shrub, Jun-Sep (*Dichantherium oligosanthos* var. *scribnerianum*).

***Paspalum*** (Knotgrass)

***P. distichum*** L. (Knotgrass) C4 rhizomatous PerGram, rare in riparian habitats in Parunuweap Canyon, Jun-Sep.

***Phalaris*** (Canary grass)

***P. arundinacea*** L. (Reed canary grass) C3 rhizomatous PerGram, uncom in wetlands, Jun-Aug (*Phalaroides arundinacea*).

***Phleum*** (Timothy)

***P. pratense*** L. (Timothy) C3 PerGram bunch, introduced from Eurasia, uncom in wetland, montane meadow, and disturbed areas, Jun-Sep.

***Phragmites*** (Reed)

***P. australis*** (Cav.) Trin. ex Steud. **ssp. americanus** Saltonst., Peterson, & Soreng (Common reed) C3 rhizomatous PerGram, uncomm, riparian, Jul-Aug. All of the Zion material I have seen is the native form (ssp. *americanus*). The non-native "ssp. *australis*" differs in having ligules less than 1 mm long (vs 1-1.7 mm in ssp. *americanus*) and culms that are ridged and not shiny (vs. round and shiny in ssp. *americanus*). Introduced plants can form dense monocultures, but stands in Zion tend to be small and interspersed with other wetland species.

***Piptatherium*** (Mountain ricegrass)

***P. micranthum*** (Trin. & Rupr.) Barkworth (Little-seed mountain ricegrass) C3 PerGram bunchgrass, rare in montane woodlands, Jun-Aug (*Oryzopsis micrantha*).

**Piptochaetium** (Speargrass)

**P. lasianthum** Griseb. (Speargrass) C3 PerGram bunchgrass, exotic (from South America). Report from Zion National Park is based on a collection by Stan Welsh from the vicinity of Lava Point in July 1987. Welsh's collection is the only record of this species from Utah and it is not otherwise reported for North America in FNA (Barkworth et al. 2007). The species resembles *Stipa lettermanii*, a species that occurs commonly in Zion NP.

**Poa** (Bluegrass)

1. Plants annual . . . . . **P. bigelovii** Vasey & Scribn. (Bigelow's bluegrass) C3 AnnGram, uncom in warm desert areas, Mar-May.
1. Plants perennial
  2. Florets replaced by bulblets or small, leafy branches; culms tufted and bulbous at base . . . . . **P. bulbosa** L. (Bulbous bluegrass) C3 AnnGram, exotic (native to Eurasia and Africa), common in disturbed areas, Apr-Jul.
  2. Florets normally developed; culms not bulbous at base, either in tufted bunches or rhizomatous
  3. Plants rhizomatous
    4. Culms strongly flattened and 2-sided; lemmas pubescent but without a tuft of tangled, cobwebby hairs at base . . . . . **P. compressa** L. (Canada bluegrass) C3 PerGram rhizomatous grass, exotic (native to Eurasia), rare, Jun-Aug.
    4. Culms round; lemmas pubescent and with a tuft of tangled, cobwebby hairs at base . . . . . **P. pratensis** L. (Kentucky bluegrass) C3 rhizomatous PerGram, exotic (native to Europe), common in sagebrush, riparian, and montane woodlands, May-Sep.
  3. Plants tufted bunchgrasses
    5. Spikelets little compressed, appearing long-cylindric, the lemmas rounded on the back, elongate and narrow with long pointed tips . . . . . **P. secunda** Presl (Sandberg's bluegrass) C3 PerGram bunch, uncom in warm desert, pinyon-juniper, & montane forests, Apr-Aug (includes *Poa ampla*, *P. juncifolia*, *P. nevadensis*, *P. scabrella*, & *P. canbyi*).
    5. Spikelets strongly compressed, appearing flattened-oblong or ovate, the glumes and lemmas keeled from the base, the lemmas usually short and broad with short obtuse tips . . . . . **P. fendleriana** (Steud.) Vasey (Muttongrass) C3 PerGram bunch, common in warm desert, sagebrush, pinyon/juniper, and montane forest habitats, Apr-Aug.

**Polypogon** (Beardgrass)

1. Glumes awnless . . . . . **P. viridis** (Gouan) Breistr. (Water polypogon) C3 rhizomatous PerGram, exotic (native to Eurasia and Africa), uncom in riparian areas, May-Aug (*Polypogon semiverticillatus*, *Agrostis semiverticillata*).
1. Glumes awned
  2. Annual; glumes obtuse and shallowly lobed at apex, awns 2-10 mm long . . . . . **P. monspeliensis** (L.) Desf. (Rabbitfoot grass) C3 AnnGram, exotic (native to Eurasia and Africa), uncom in riparian areas, Jun-Aug.
  2. Perennial; glumes acute and entire to minutely bifid at the apex, awn 1-3 mm long . . . . . **P. interruptus** H.B.K. (Ditch polypogon), C3 PerGram bunch, exotic (native to Eurasia), rare in riparian and disturbed areas, May-Aug.

**Puccinellia** (Alkaligrass)

**P. distans** (L.) Parl. (Weeping alkaligrass) C3 PerGram bunch, exotic (native to Eurasia), Reported by Cogan et al. (2004), warm desert shrub, grassland/meadow, pinyon-juniper, and riparian areas, Jun-Aug.

**Schizachyrium** (Little bluestem)

**S. scoparium** (Michx.) Nash (Little bluestem) C4 PerGram bunch, desert shrub, pinyon-juniper, montane grasslands, and riparian areas, Jul-Sep (*Andropogon scoparius*).

**Sclerochloa** (Hardgrass)

**S. dura** (L.) Beauv. (Hardgrass) C3 AnnGram, introduced from Eurasia, rare in disturbed areas, May-Jul.

**Secale** (Rye)

**S. cereale** L. (Cultivated rye) C3 AnnGram, introduced from Eurasia, uncom in desert shrub, grassland/meadow, mountain shrub, and disturbed areas, May-Aug.

**Setaria** (Bristlegrass)

1. Margin of sheath glabrous; second glume one-half length of the entire spikelet; uppermost lemma cross-wrinkled at maturity . . . . . **S. glauca** (L.) Beauv.  
(Yellow bristlegrass) C4 AnnGram, exotic (native to Eurasia), uncom in disturbed areas, Jul-Sep (*Setaria pumila*, *Pennisetum glaucum*).
1. Margin of sheath ciliate near summit; second glume equal or subequal to the length of the entire spikelet; uppermost lemma smooth or obscurely wrinkled at maturity
  2. Spikelet bristles 5.5-11 mm long, scabrous hairs on bristles pointed upwards; inflorescence spike-like . . . . . **S. viridis** (L.) Beauv.  
(Green bristlegrass) C4 AnnGram, exotic (native to Eurasia), uncom in disturbed areas, Jun-Sep.
  2. Spikelet bristles 2-5 mm long, scabrous hairs on bristles pointed downwards; inflorescence branches in verticels . . . . . **S. verticillata** (L.) Beauv.  
(Bur bristlegrass) C4 AnnGram, exotic (native to Eurasia), uncom in disturbed areas, Jul-Sep.

**Sorghastrum** (Indiangrass)

**S. nutans** (L.) Nash (Indiangrass) C4 rhizomatous PerGram, rare in riparian areas, Aug-Sep. (*Sorghastrum avenaceum*)

**Sorghum** (Johnson grass)

1. Perennial; leaf blades 4-15 mm wide; terminal segment of awn 4-7 mm long . . . . . **S. halepense** (L.) Pers.  
(Johnson grass, Millet) C4 rhizomatous PerGram, exotic (native to Eurasia), uncom in disturbed or riparian areas, Utah state noxious weed, Jul-Sep.
1. Annual; leaf blades 20-45 mm wide; terminal segment of awn 2-4 mm long . . . . . **S. bicolor** (L.) Moench  
(Grain sorghum) C4 AnnGram, exotic (native to Eurasia).

**Sphenopholis** (Wedgegrass)

**S. obtusata** (Michx.) Scribn. (Prairie wedgegrass) C3 PerGram bunch, uncom in riparian areas, Jul-Sep.

**Sporobolus** (Dropseed)

1. Panicle compact and spikelike, glumes and lemmas keeled
  2. Spikelets 2-2.5 mm long; panicles 0.3-0.8 cm broad; culms less than 5 mm in thickness . . . . . **S. contractus** A.S. Hitchc.  
(Spike dropseed) C4 PerGram, bunch, uncom in sandy soils in desert shrub, sagebrush, & pinyon-juniper, Jun-Sep.
  2. Spikelets 2.5-3.5 mm long; panicles 0.5-4 cm broad; culms 4-10 mm in thickness . . . . . **S. giganteus** Nash  
(Giant dropseed) C4 PerGram bunch, Reported by Nelson (1976), sandy soil in desert shrublands, Jun-Sep.
1. Panicle open, oblong, or pyramidal, glumes and lemmas rounded or keeled
  3. Sheaths with only a few spreading hairs at the summit, sometimes nearly glabrous; panicle branches with spikelets borne chiefly near the tips; glumes usually glabrous; anthers 1.2-1.5 mm long . . . . . **S. airoides** (Torr.) Torr. **var. airoides**  
(Alkali sacaton) C4 PerGram bunch, uncom in saline soils in desert shrub, pinyon-juniper, & sagebrush grasslands, Jun-Aug.
  3. Sheaths with a conspicuous tuft of white hairs at the summit; panicle branches usually spikelet-bearing nearly to base; glumes scabrous on the keel; anthers 0.4-1 mm long
    4. Panicle oblong, 5-12 cm broad, the lower branches about the same length as the middle ones, flexuous and often reflexed, the spikelets loosely arranged . . . . . **S. flexuosus** (Thurb. ex Vasey) Rydb.  
(Mesa dropseed) C4 PerGram bunch, uncom in desert shrub, pinyon-juniper, and sagebrush grassland, Jun-Sep.
    4. Panicle narrowly pyramidal or somewhat contracted, 1.5-5 cm broad, the lower branches much exceeding the middle ones and mostly ascending, the spikelets crowded on branchlets . . . . . **S. cryptandrus** (Torr.) Gray  
(Sand dropseed) C4 PerGram bunch, common in sandy sagebrush, pinyon-juniper, and montane areas, Jun-Aug.

**Triticum** (Wheat)

**T. aestivum** L. (Wheat) C3 AnnGram, exotic (native to Eurasia), uncom in disturbed areas, Apr-Jul.



**Vulpia** (Annual fescue)

1. Spikelets with 6-15 florets; awns 1.5-5 mm long . . . . . **V. octoflora** (Walter) Rydb.  
(Sixweeks fescue) C3 AnnGram, uncom in desert shrub, grassland/meadow, pinyon-juniper, and Ponderosa pine/Douglas-fir, Apr-Jun (*Festuca octoflora*).
1. Spikelets with mostly 1-5 florets; awns 5-17 mm long
  2. First glume 0.3-1.5 mm long, about 1/3 the length of the second glume . . . . . **V. myuros** (L.) Gmel.  
(Foxtail fescue) C3 AnnGram; exotic (native to Eurasia), uncom in disturbed areas, Apr-Jul (*Festuca myuros*).
  2. First glume 3-7 mm long, more than 1/2 the length of the second glume
    3. Middle and lower spikelets and pedicels widely spreading or reflexed at maturity; pedicels nearly sessile . . . . .  
. . . . . **V. microstachys** (Nutt.) Benth.  
(Small fescue) C3 AnnGram, uncom in sandy riparian and disturbed areas, May-Jun (*Festuca microstachys*).
    3. All spikelets and pedicels erect and ascending; pedicels short but not sessile . . . . **V. bromoides** (L.) S.F. Gray  
(Brome six-weeks grass) C3 AnnGram, exotic (Native to Europe), disturbed areas, Apr-Jul (*Festuca bromoides*).

**Polemoniaceae** (Phlox Family)

1. Leaves simple and with entire margins
  2. Leaves alternate throughout
    3. Annual; flowers salmon, orange, pink, or purplish (rarely white) . . . . . **Collomia**
    3. Plants perennial; flowers white . . . . . **Ipomopsis congesta var. frutescens**
  2. Leaves opposite on the lower half of the stem, opposite or alternate on upper stem
    4. Plants perennial; stems erect or loosely to densely sprawling over the ground; leaves spine-tipped . . . . **Phlox**
    4. Plants annual; stems erect, simple or few-branched but not sprawling over the ground; leaves not spine-tipped
      5. Leaves opposite throughout, at least some blades usually deeply divided, if simple then narrow; corolla white washed with purple or with purplish spots . . . . . **Linanthus**
      5. Leaves alternate on upper stem, blades all simple and flat; flowers pink or lavender . . . . . **Microsteris**
1. Leaves pinnately or palmately compound or deeply lobed, or if simple with conspicuously toothed, hair-like, or sharp-spiny margins
  6. Leaves usually opposite (alternate above and opposite below in some *Linanthus*) but often appearing whorled, blades palmately divided to the base and sessile
    7. Plants annual forbs (*Linanthus, sensu stricto*) . . . . . **Linanthus**
    7. Plants perennial forbs or shrubby
      8. Leaves stiff, sharp-pointed; flowers opening in evening (*Leptodactylon*) . . . . . **Linanthus**
      8. Leaves flexible, not stiff or sharp-pointed; flowers opening any time (*Linanthastrum*) . . . . . **Leptosiphon**
  6. Leaves alternate or mostly in a basal rosette, blades pinnately lobed or divided, usually not sessile
    9. Leaves and calyx lobes tipped by long, hair-like bristles . . . . . **Langloisia**
    9. Leaves and calyx lobes acute to spine-tipped, but not hair-like at tips
      10. Calyx lobes unequal; flowers in a ball-like cluster subtended by spiny or woolly bracts
        11. Flower heads woolly; anthers over 0.5 mm long; leaves soft, segments pointed but not spiny at tips . . . . .  
. . . . . **Eriastrum**
        11. Flower heads glandular or pubescent but not woolly; anthers to 0.5 mm long; leaves stiff with spiny tips . . .  
. . . . . **Navarretia**
      10. Calyx lobes equal; flowers in elongate panicles or racemes or if in a ball-like cluster not subtended by spiny or woolly bracts or bracts broad and shallowly toothed
        12. Plants annual; largest leaves form a basal rosette, stem leaves all much smaller; inflorescence an open panicle; corolla 3-12 mm long, mostly bluish or pink-lavender (sometimes white) with a yellow throat . . . . .  
. . . . . **Gilia**
        12. Plants annual or perennial; stem and basal leaves similar in size, or leaves mostly on the stem; inflorescence an open panicle with corollas 15-45 mm long or condensed and ball-like with corollas 3-9 mm long, flowers mostly uniformly red, pinkish, white, or blue . . . . . **Ipomopsis**

**Collomia** (Collomia)

1. Corolla salmon or orangish, 15-30 mm long, corolla tube much longer than the calyx . . . . .  
. . . . . **C. grandiflora** Dougl. ex Lindl.  
(Large collomia) AnnForb, uncom in pinyon-juniper/oak & montane conifer, Jun-Aug.
1. Corolla pink to purplish or white, 8-15 mm long, corolla tube slightly longer than the calyx . . . . . **C. linearis** Nutt.  
(Small collomia) AnnForb; rare in sagebrush & pinyon-juniper, May-Aug.

**Eriastrum** (Eriastrum)

1. Corolla dark blue-lavender, 13-19 mm long, often appearing bi-lobed (upper 3 lobes larger than 2 lower lobes), with lobes 5-8 mm long . . . . . **E. eremicum** (Jepson) Mason (Mohave eriastrum) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Apr-Jun.
1. Corolla whitish to pale blue-lavender, 6-13 mm long, not appearing bi-lobed (all 5 lobes equal in size), lobes 2-5 mm long
  2. Plants prostrate-ascending, usually broader than tall; anthers 0.4-0.6 mm long . . . . . **E. diffusum** (Gray) Mason (Spreading eriastrum) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, May-Jun.
  2. Plants erect or ascending, usually taller than broad; anthers 0.7-1.3 mm long . . . . . **E. sparsiflorum** (Eastw.) Mason (Few-flower eriastrum) AnnForb, rare in warm desert, sagebrush, & pinyon-juniper, May-Aug.

**Gilia** (Gilia)

Includes *Aliciella*

1. Basal leaves spoon-shaped, shallowly toothed or lobed on margins (not extending more than halfway to the midrib); corolla lobes with a cusp-like tooth, stem base and lower leaves glabrous (*Aliciella*) . . . . . **G. leptomeria** Gray var. **leptomeria** (Common gilia) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper/oak, & montane conifer, May-Jun (*Aliciella leptomeria*). Many species of *Aliciella* seem distinct from *Gilia*, but *G. leptomeria* shows affinities with true *Gilia*, and is thus retained here, though it is likely to be split by FNA when the Polemoniaceae volume is published.
1. Basal leaves elliptic, once or twice pinnately divided with teeth and lobes extending nearly to the midrib; corolla lobes rounded, stem base and lower leaves glabrous, glandular, or with cobwebby hairs
  2. Base of stem and lower leaves with fine, loose, white cobwebby hairs or occasionally glabrous . . . . . **G. inconspicua** (J.E. Sm.) Sweet (Shy gilia) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, oak, Apr-Jul. Two overlapping varieties occur in Zion: var. *inconspicua* has twice-pinnately lobed leaves and var. *sinuata* (Dougl.) Gray has once-pinnately divided leaves.
  2. Base of stem and lower leaves pubescent with gland-tipped hairs . . . . . **G. scopulorum** Jones (Rock gilia) AnnForb; Reported by Ott (2010) from warm desert shrub, Apr-May.

**Ipomopsis** (Gilia)

1. Flowers mostly sessile, borne in a compact head or spike; flowers less than 15 mm long
  2. Plants annual; leaves pinnately lobed; flower heads subtended by an involucre of stem leaves . . . . . **I. polycladon** (Torr.) Grant (Spreading gilia) AnnForb, rare in warm desert, sagebrush, & pinyon-juniper, Apr-Jun (*Gilia polycladon*).
  2. Plants perennial; leaves entire; flower heads not subtended by an involucre of stem leaves . . . . . **I. congesta** (Hook.) Grant
    3. Stems 15-80 cm tall, woody at the base; leaves often entire . . . . . var. **frutescens** (Rydb.) Welsh (Shrubby gilia) PerForb, uncom in sandy areas in pinyon-juniper, sagebrush, oak, & montane conifer, Jun-Sep. Type locality is Springdale, UT (*Gilia congesta* var. *frutescens*).
    3. Stems 5-20 cm tall, not woody at the base; leaves tri-lobed or pinnately divided . . . . . var. **congesta** (Ball-head gilia) PerForb, rare in Kolob area in warm desert & pinyon-juniper, May-Aug (*Gilia congesta* var. *congesta*).
1. Flowers usually stalked, in open panicles; flowers 15-45 mm long
  4. Flowers white to pale blue; lateral lobes of stem leaves mostly 1-2 cm long . . . . . **I. longiflora** (Torr.) Grant (Long-flower gilia) PerForb, uncom in sandy areas in sagebrush, pinyon-juniper, oak, & montane conifer, May-Aug (*Gilia longiflora*).
  4. Flowers red, pinkish, or white, lateral lobes of stem leaves less than 1 cm long . . . . . **I. aggregata** (Pursh) Grant
    5. Lobes of calyx equal or shorter than the tube . . . . . var. **arizonica** (Greene) Welsh (Scarlet gilia) PerForb, uncom in pinyon-juniper/oak & sagebrush, May-Aug (*Gilia aggregata* var. *arizonica*, *Ipomopsis arizonica*).
    5. Lobes of calyx longer than the tube . . . . . var. **aggregata** (Scarlet gilia) PerForb uncom-juniper, oak, sagebrush, montane conifer, & wetlands, May-Aug (*Gilia aggregata* var. *aggregata*).

**Langloisia** (Langloisia)

- L. setosissima** (Torr. & Gray) Greene (Mohave langloisia) AnnForb, uncom in warm desert & pinyon-juniper, Mar-May.

**Leptosiphon** (Flaxflower)

**L. nuttallii** (Gray) Porter & Johnson (Nuttall's linanthus) PerForb, uncom in pinyon-juniper/oak & montane conifer, Jun-Aug (*Linanthus nuttallii*, *Linanthastrum nuttallii*)

**Linanthus** (Linanthus, Prickly phlox)

Includes *Leptodactylon*

1. Plants annual; leaves thin (*Linanthus, sensu stricto*)
  2. Corolla 8-15 mm long, the lobes less than 5 mm wide ..... **L. bigelovii** (Gray) Greene (Bigelow's linanthus) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Apr- May.
  2. Corolla 15-30 mm long, the lobes 5-10 mm wide ..... **L. dichotomous** Benth. (Evening-snow) AnnForb, uncom in pinyon-juniper, sagebrush, & montane conifer, Apr- May.
1. Plants perennial; leaves firm and stiff (*Leptodactylon*)
  3. Calyx and corolla 5-lobed; leaves mainly alternate; plants erect to ascending, loosely open shrubs ..... **L. pungens** (Torr.) J.M. Porter & L.A. Johnson (Prickly-phlox) Shrub, uncom in warm desert, pinyon-juniper, oak, sagebrush, & montane conifer, May-Jul (*Leptodactylon pungens*).
  3. Calyx and corolla usually 6-lobed; leaves mainly opposite; plants clump-forming .. **L. watsonii** (Gray) Wherry (Watson's prickly-phlox) PerForb, historical in rocky areas in pinyon-juniper/oak & montane conifer, May-Aug (*Leptodactylon watsonii*).

**Microsteris** (Microsteris)

**M. gracilis** (Hook.) Greene **var. humilior** (Hook.) Cronq. (Slender phlox) AnnForb, uncom in pinyon-juniper, sagebrush, oak, & montane conifer, Mar-Jun (*Phlox gracilis*).

**Navarretia** (Pincushion)

1. Plants glandular; flowers yellow ..... **N. breweri** (Gray) Greene (Yellow navarretia) AnnForb, uncom in pinyon-juniper/oak, sagebrush, & montane conifer, May-Jul.
1. Plants pubescent but not glandular; flowers white, blue, or lavender ..... **N. intertexta** (Benth.) Hook. (Great Basin navarretia) AnnForb, Reported (Weight 1937) in pinyon-juniper/oak & montane conifer, Jun-Aug.

**Phlox** (Phlox)

1. Stems erect, single or few, mostly over 7 cm tall; flowers on elongate stalks; leaves 1-9 cm long ..... **P. longifolia** Nutt. (Long-leaf phlox) PerForb, common in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jul.
1. Stems densely or loosely matted, numerous, spreading, mostly less than 7 cm tall; flowers sessile or nearly so; leaves 0.5-3.5 cm long ..... **P. austromontana** Cov.
  2. Stems loosely matted, internodes elongated; corolla lobes 9-13 mm long; calyx glabrous; flowers usually bright pink, fading to whitish (rarely white); leaves 2-3.5 cm long ..... **var. jonesii** (Wherry) Welsh (Jones' phlox) PerForb, common in sagebrush, pinyon-juniper, oak, & montane conifer, Apr-May. Type locality is Zion Canyon.
  2. Stems densely to loosely matted; corolla lobes 5-8 mm long; calyx hairy; flowers white or pink; leaves 0.5-2 cm long
  3. Stems densely matted; internodes short, mostly hidden by leaves; flowers usually white ..... **var. austromontana** (Desert phlox) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jun.
  3. Stems loosely matted; internodes long, not hidden by leaves; flowers often pink ..... **var. prostrata** E. Nels. (Silver Reef phlox) PerForb, common in sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jun. Intermediate between vars. *jonesii* and *austromontana* and perhaps best considered a growth phase of var. *austromontana*. Type locality is Silver Reef, UT.

**Polygonaceae** (Buckwheat Family)

1. Sheathing stipules (ocrea) lacking; flowers subtended by an involucre of 3-6 free or fused bracts
  2. Involucre and bracts spine-tipped; plants annual ..... **Centrostegia**
  2. Involucre and bracts not spiny; plants annual, perennial, or shrubby ..... **Eriogonum**
1. Sheathing stipules (ocrea) present; flowers not subtended by an involucre or 2-toothed bract
  3. Tepals 6, the outer ones often turned downward ..... **Rumex**
  3. Tepals usually 5 (rarely 4), all erect (*Polygonum, sensu lato*)

4. Outer perianth segments winged or keeled on back; plants vine-like with twining stems; leaves arrowhead-shaped and long-petioled . . . . . **Fallopia**
4. Outer perianth segments not winged or keeled on the back; plants with erect or prostrate stems not twining or vine-like; leaves elliptic, oblong, or linear, sessile or short-petioled
5. Ocrea silvery, 2-lobed at tip; leaves jointed at base . . . . . **Polygonum** (*sensu stricto*)
5. Ocrea papery, truncate at tip and with ciliate hairs; leaves not jointed at base . . . . . **Persicaria**

**Centrostegia** (Spineflower)

**C. thurberi** Gray ex Benth. in DC. (Thurber's spineflower) AnnForb, uncom in sandy areas in warm desert, sagebrush, & pinyon-juniper, Mar-Jul.

**Eriogonum** (Wild buckwheat)

1. Annuals with slender tap roots
  2. Involucres sessile, erect, appressed to the stem, angled or strongly ribbed
    3. Leaves on stem and in a basal rosette . . . . . **E. polycladon** Benth. (Leafy wild buckwheat) AnnForb, Reported (Welsh 1995) from sandy soils in pinyon-juniper, Mar-Aug.
    3. Leaves all in a basal rosette
    4. Stems woolly-pubescent . . . . . **E. palmerianum** Reveal (Palmer's wild buckwheat) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Mar-Oct.
    4. Stems glabrous . . . . . **E. davidsonii** Greene ex J.A. Clark (Davidson's wild buckwheat) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, May-Sep.
  2. Involucres on a short stalk, or if sessile not appressed to the stem, not angled or strongly ribbed
    5. Leaves glabrous; flowering stems usually strongly inflated
      6. Flowering stems yellow or yellow-green; annual with slender taproot . . . . . **E. fusiforme** Small (Grand Valley desert trumpet) AnnForb, uncom in warm desert on clay soils in Huber Wash, May-Jul (*E. inflatum* var. *fusiforme*).
      6. Flowering stems brownish-purple and glaucous; usually biennial or perennial with a woody rootstalk, young plants may be mistaken for annual . . . . . **E. inflatum** Torr. & Frem. (Desert trumpet) PerForb, uncom in warm desert, sagebrush, & pinyon-juniper, Mar-Oct (*E. inflatum* var. *inflatum*).
    5. Leaves woolly tomentose on the under surface of the blades; flowering stems not inflated
      7. Involucres 0.3-1 mm long, on erect or spreading stalks . . . . . **E. subreniforme** Wats. (Kidney-shaped wild buckwheat) AnnForb, uncom on Chinle Barrens in warm desert shrub & pinyon-juniper, Apr-Oct; type locality from Virgin River Valley.
      7. Involucres 1-3 mm long, on drooping stalks or sessile and drooping
        8. Involucres usually sessile; flowers white to pink . . . . . **E. deflexum** Torr. (Skeletonweed wild buckwheat) AnnForb, uncom in warm desert & pinyon-juniper, Apr-Oct.
        8. Involucres usually stalked; flowers white . . . . . **E. cernuum** Nutt.
          9. Stems and inflorescence 5-45 cm tall; leaves all basal . . . . . **var. cernuum** (Nodding wild buckwheat) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Oct.
          9. Stems and inflorescences 40-65 cm tall; leaves basal or some along lower stem . . . . . **var. psammophilum** Welsh (Sand dune nodding wild buckwheat) AnnForb, rare in burned sandy areas at East Entrance of Zion. Only a tall form of var. *cernuum* according to Reveal in FNA & Intermountain Flora. Type locality is north of Orderville, UT.
  1. Shrubs, subshrubs, or perennial forbs with a woody stem crown
    10. Plants definitely shrubby, stems developed above ground level and with 1-several elongated internodes not obscured by woolly hairs
      11. Leaves linear to narrowly oblong or narrowly elliptic, blades mostly 5-10 times longer than broad
        12. Leaves clustered; flowers pubescent . . . . . **E. fasciculatum** Benth. **var. polifolium** (Benth.) Torr. & Gray (Mojave wild buckwheat) Shrub, uncom in warm desert, Mar-Oct.
        12. Leaves not clustered; flowers glabrous . . . . . **E. microthecum** Nutt. **var. simpsonii** (Benth.) Reveal (Slender wild buckwheat) Shrub, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Jun-Oct.
      11. Leaves oval to oblong or elliptic, blades mostly less than 3 times longer than broad
        13. Leaf apices acute, the blades mostly elliptic and more or less revolute, mainly less than 8 mm wide . . . . . **E. microthecum** **var. simpsonii** (see couplet 12)
        13. Leaf apices typically rounded, the blades orbicular to oblong or ovate to obovate, seldom if at all revolute, mainly more than 8 mm wide

14. Leaves with petioles mainly 0.5-1.8 cm long, inflorescence mostly ¼ or less the plant height . . . . . ***E. corymbosum*** Benth.  
 . . . . .
15. Flowers white or pinkish . . . . . **var. *corymbosum***  
 (Crisp-leaf wild buckwheat) Shrub, uncom in warm desert, sagebrush, & pinyon-juniper, Jul-Oct.
15. Flowers yellow . . . . . **var. *glutinosum*** (Jones) Jones  
 (Yellow crisp-leaf wild buckwheat) Shrub; uncom on clay soils of warm desert shrub & pinyon-juniper in Kolob area, Aug-Oct (Included in *E. corymbosum* var. *aureum* by Welsh et al. 2008, but this variety is a narrow endemic of the Shivwits Reservation west of Santa Clara).
14. Leaves with petioles mainly 2-10 cm long; inflorescence mostly 1/3-1/2 of plant height . . . . .  
 . . . . . ***E. thompsoniae*** Wats.
16. Flowers yellow . . . . . **var. *thompsoniae***  
 (Thompson's wild buckwheat) Subshrub, uncom on Chinle & Moenkopi soils in warm desert & pinyon-juniper, Jul-Nov (*E. corymbosum* var. *thompsoniae*).
16. Flowers white . . . . . **var. *albiflorum*** Reveal  
 (Virgin wild buckwheat) Subshrub, locally common in warm desert, & pinyon-juniper on rocky clay soils, Aug-Oct, type locality from 3 miles W of Virgin (*E. corymbosum* var. *albiflorum*). Includes var. *matthewsiae* Reveal, a form with a shrubby growth form with stems not clustered at the base, probably from introgression with *E. corymbosum* (Reveal in Holmgren et al. 2012). This form is common in the southwest corner of Zion NP on clay desert soils. Type of var. *matthewsiae* from 0.3 miles south of Springdale.
10. Plants stemless or prostrate at ground level or internodes very short and obscured by woolly hairs
17. Flowers tapering to narrow, stalk-like bases (differentiated from the true flower stalk by a knot-like joint), yellow
18. Flowers hairy . . . . . ***E. arcuatum*** Greene **var. *rupicola*** (Reveal) Reveal  
 (Slickrock wild buckwheat) PerForb, locally common on Navajo sandstone slickrock, Jun-Oct, endemic to Zion NP, type locality from Checkerboard Mesa (*E. jamesii* var. *rupicola*).
18. Flowers glabrous . . . . . ***E. umbellatum*** Torr. **var. *subaridum*** Stokes  
 (Arid wild buckwheat) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Jun-Oct.
17. Plants blunt or rounded at base, not tapering to a stalk-like base, white, pinkish, or yellow
19. Plants stemless and cushion or mound-forming; leaves all in a basal rosette; inflorescences mainly 0.5-5 cm tall; leaves less than 1 cm long
20. Flowering stalks usually inflated, brownish-purple or glaucous; flowers yellow or reddish, hairy, 1-2.5 mm long; inflorescence open . . . . . ***E. inflatum*** Torr. & Frem. (see couplet 6)
20. Flowering stalks not inflated, glabrous or woolly; flowers white, pink, or yellow, glabrous, 2-7 mm long; inflorescence ball-like
21. Leaf blades all oval to orbicular and about as broad as long; flowers white, pink, or yellow, 3-7 mm long . . . . .  
 . . . . . ***E. ovalifolium*** Nutt.  
 (Cushion wild buckwheat) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, & oak, Apr-Aug.
21. Leaf blades much longer than broad; flowers white, 2-3 mm long . . . . .  
 . . . . . ***E. panguicense*** (Jones) Reveal **var. *panguicense***  
 (Panguitch wild buckwheat) PerForb, uncom on Carmel sandstone in pinyon-juniper/oak & montane conifer, Jun-Sep.
19. Plants with erect leafy stems (although stem leaves may be small), not cushion or mound-forming; inflorescences over 5 cm tall; leaves more than 1 cm long
22. Caudex branches or root crown 1-2.5 cm thick, covered with persistent leaf bases and coarse, spreading hairs; plants wand-like, 3-12 dm tall; inflorescence a panicle or cyme . . . . . ***E. alatum*** Torr.  
 (Winged wild buckwheat) PerForb, uncom in sandy soils in pinyon-juniper, Jun-Oct.
22. Caudex branches or root-crown less than 1 cm thick, or of thicker, not covered with persistent leaf bases and coarse-spreading hairs; plants shorter; inflorescence a raceme
23. Flowering stems not swollen, usually woolly . . . . . ***E. racemosum*** Nutt.  
 (Redroot wild buckwheat) PerForb, uncom in sagebrush, pinyon-juniper, oak, & montane conifer, Jun-Oct (*E. racemosum* var. *racemosum*).
23. Flowering stems usually swollen below the first branches of the inflorescence, usually glabrous . . . . .  
 . . . . . ***E. zionis*** Howell  
 (Zion wild buckwheat) PerForb, common on sandy soils in sagebrush, pinyon-juniper, oak, & montane conifer, Jun-Oct (*E. racemosum* var. *zionis*). Type locality is Clear Creek Canyon in Zion NP.

**Fallopia** (False buckwheat)

***F. convolvulus*** (L.) Löve (Black bindweed) AnnForb, Historic, in disturbed areas, May-Oct, introduced from Europe (*Polygonum convolvulus*).

**Persicaria** (Knotweed)

**P. maculosa** Gray (Lady's-thumb) AnnForb, uncom in disturbed areas, Mar-Nov, introduced from Eurasia (*Polygonum persicaria*).

**Polygonum** (Knotweed)

See also *Fallopia* and *Persicaria*

1. Plants mostly prostrate to erect, stems round and 8-16 ribbed; leaf blades with pinnate venation and conspicuous lateral veins; fruits brown and dull . . . . . **P. aviculare** L. (Yard knotweed) AnnForb, uncom in disturbed areas, May-Oct, introduced from Eurasia.
1. Plants erect, stems 4-sided and not obviously ribbed; leaf blades with parallel venation or lacking obvious lateral veins; fruits black or yellowish-brown to brown
2. Tepals acute, white or pink, 1.5-3 mm long; flowers in terminal, spike-like inflorescences, individual flowers subtended by slender, elongate bracts 5 times or more longer than the flowers; fruit yellowish-brown to brown . . . . . **P. kelloggii** Greene (Kellogg's knotweed) AnnForb, rare in pinyon-juniper, sagebrush, oak, & montane conifer, Jun-Sep.
2. Tepals rounded at tip, green with white or pink margins or all white, 2-4.5 mm; flowers axillary and subtended by bracts 1-4 times longer than the flowers; fruit black
3. Pedicels of oldest flowers recurved or reflexed; flowers green with white or pink margins, 3-4.5 mm long . . . . . **P. douglasii** Greene (Douglas' knotweed) AnnForb, uncom in pinyon-juniper, sagebrush, oak, & montane conifer, Jun-Oct (*P. douglasii* var. *douglasii*).
3. Pedicels of oldest flowers erect, not reflexed; flowers greenish with pink to red margins or white, 2-4 mm long
4. Flowers not opening widely, green with pink to red margins, 3-4 mm long; leaves narrowly oblong, elliptic, or linear . . . . . **P. sawatchense** Small (Sawatch knotweed) AnnForb, common in pinyon-juniper, sagebrush, oak, & montane conifer, Jun-Aug (*P. douglasii* var. *johnstonii*).
4. Flowers opening widely (tepals spreading), white, 2-3 mm long; leaves linear . . . . . **P. utahense** Brenkle & Cottam (Utah knotweed) AnnForb, uncom on sandy soils in pinyon-juniper & montane conifer, Jun-Sep, (*P. douglasii* var. *utahense*), type locality from 6 miles N of Escalante, UT.

**Rumex** (Dock)

1. Leaves arrowhead-shaped; flowers all unisexual and plants dioecious; perianth in flower less than 1.5 mm long . . . . . **R. acetosella** L. (Sheep sorrel) PerForb, uncom in disturbed areas, introduced from Eurasia, Apr-Sep.
1. Leaves not arrowhead-shaped; flowers bisexual; perianth in flower over 1.5 mm long
2. Valves of fruits 10-20 mm wide, not bearing grains or callosities; plants with clusters of tuberous roots . . . . . **R. hymenosepalus** Torr. (Canaigre dock) PerForb, uncom in sandy soils in warm desert & pinyon-juniper, Apr-Jun.
2. Valves of fruits less than 10 mm wide, bearing grains or callosities on at least one face; plants tap-rooted
3. Stems with axillary shoots below the inflorescence, usually decumbent-ascending . . . . . **R. salicifolius** Weinm. **ssp. triangulivalvis** Danser (Willow dock) PerForb, uncom in disturbed areas, warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, May-Sep.
3. Stems without axillary shoots below the inflorescence, erect . . . . . **R. crispus** L. (Curly dock) PerForb; Historical in disturbed areas, May-Sep, introduced from Eurasia.

**Polypodiaceae** (Polypody Fern Family)

Polypodiaceae sensu stricto; see Aspleniaceae, Dennstaedtiaceae Dryopteridaceae, and Pteridaceae for segregate families following *Flora of North America* (1993)

**Polypodium** (Polypody)

**P. hesperium** Maxon (Western polypody) Fern, uncom in rock crevices in montane conifer (*P. vulgare* var. *columbianum*).

**Portulacaceae** (Purslane Family)

See Montiaceae for additional genera formerly included in Portulacaceae

**Portulaca** (Purslane)

**P. oleracea** L. (Common purslane) AnnForb, uncom in disturbed areas, Jun-Sep, native to E North America.

**Potamogetonaceae (Pondweed Family)**

Includes Zannichelliaceae

- 1. Leaves alternate; flowers and fruits in terminal, spike-like inflorescences; fruits rounded, without an obvious beak . . . . . **Stuckenia**
- 1. Leaves opposite; flowers and fruits in leaf axils; fruits elongate with a prominent beak (Zannichelliaceae) . . . . . **Zannichellia**

**Stuckenia** (Pondweed)

**S. filiformis** (Pers.) Börner (Slenderleaf pondweed) PerForb, rare in wetlands, Jul-Sep (*Potamogeton filiformis* var. *occidentalis*).

**Zannichellia** (Horned pondweed)

**Z. palustris** L. (Horned pondweed) PerForb, rare in wetlands, Mar-Nov.

**Primulaceae (Primrose Family)**

- 1. Flowers pink (rarely white), nodding, over 6 mm long; corolla lobes flared backwards; stamens forming a cylinder and exerted well beyond the petals . . . . . **Dodecatheon**
- 1. Flowers white, erect or spreading, less than 2 mm long; corolla lobes erect; stamens attached to corolla tube, not exerted beyond the petals
  - 2. Leaves linear to narrowly oblong, toothed or entire, all basal; calyx 3-4.5 mm long . . . . . **Androsace**
  - 2. Leaves broadly elliptic to spoon-shaped, entire, in a basal cluster and alternate along the stem; calyx 1-2.5 mm long . . . . . **Samolus**

**Androsace** (Rock jasmine)

**A. septentrionalis** L. (Pygmy-flower rock-jasmine) AnnForb, uncom in pinyon-juniper, sagebrush, oak, & montane conifer, May-Aug.

**Dodecatheon** (Shooting star)

**D. pulchellum** (Raf.) Merr. var. **zionense** (Eastw.) Welsh (Zion shooting-star) PerForb, locally com only in hanging gardens, Mar-Aug, type locality is Zion Canyon.

**Samolus** (Water pimpernel)

**S. valerandi** L. (Water pimpernel) PerForb, uncom in wetlands, May-Aug (*S. floribundus*).

**Pteridaceae (Lip-fern Family)**

Includes Adiantaceae & Sinopteridaceae

- 1. Underside of leaflets white-powdery from tiny, waxy-scales; sori not covered by leaflet margins, arranged in several lines following the main veins; leaf blades triangular. . . . . **Pityrogramma**
- 1. Underside of leaflets glabrous to densely hairy or scaly but not white-powdery; sori usually at least partially covered by inrolled leaflet margins, located along edge of leaflet rather than forming lines along veins; leaf blades longer than wide to curved-spreading, but not triangular
  - 2. Sori scattered along leaflet margins and covered by the folded tips of leaflet lobes; leaflets glabrous; leaf blades elongate or curved-spreading . . . . . **Adiantum**
  - 2. Sori in a continuous ring around the leaflet margins, partially covered by the rolled margins; leaflets often hairy; leaf blades longer than wide
    - 3. Leaflet margins entire or lobed only at the base; leaves glabrous or sparsely hairy . . . . . **Pellaea**
    - 3. Leaflet margins deeply lobed throughout; leaves woolly-hairy beneath . . . . . **Cheilanthes**

**Adiantum** (Maidenhair fern)

- 1. Blades longer than broad; stipe not dichotomously branched; leaflets fan-shaped or rhomboid; rhizome scales less than 0.5 mm wide . . . . . **A. capillus-veneris** L. (Southern maidenhair fern) Fern, common in hanging gardens & wetlands.
- 1. Blades broader than long; stipe dichotomously branched apically; leaflets rectangular; rhizome scales 1-2 mm wide . . . . . **A. pedatum** L. var. **aleuticum** Rupr. (Northern maidenhair fern) Fern, uncom in wetlands.

***Cheilanthes*** (Lipfern)

- 1. Leaf blades densely white or brownish hairy below and green above . . . . . ***C. feei*** Moore  
(Slender lip-fern) Fern, uncom in rock crevices in pinyon-juniper/montane zone
- 1. Leaf blades with dense, appressed white or brown scale
  - 2. Leaves tufted; rhizome short . . . . . ***C. covillei*** Maxon  
(Coville's lip-fern) Fern, uncom in rock crevices in warm desert zone
  - 2. Leaves widely scattered; rhizome elongate . . . . . ***C. wootonii*** Maxon  
(Wooton's lip-fern) Fern, rare in rock crevices in pinyon-juniper/montane zone

***Pellaea*** (Cliff-brake)

- 1. Scales of rhizome bi-colored (pale brown with a black stripe); leaf stalks flat or convex; leaflets sharp-pointed at tips
  - 2. Leaves broadest at base; subdivisions of leaflets oval-shaped . . . . . ***P. truncata*** Goodding  
(Spiny cliff-brake) Fern, uncom in rock crevices.
  - 2. Leaves broadest at middle; subdivisions of leaflets linear . . . . . ***P. wrightiana*** Hook.  
(Wright's cliff-brake) Fern, rare in rock crevices, hybrid between *P. truncata* x *P. mucronata*.
- 1. Scales of rhizome uniformly colored (tan or rusty brown); leaf stalks round; leaflets blunt at tips
  - 3. Leaf stalk dark purple to blackish; terminal segment of leaflets sparsely pubescent beneath; leaf axis densely pubescent with short, curly, appressed hairs; leaf blades 15-30 cm long x 10-20 cm wide and triangular to oblong or lanceolate . . . . . ***P. atropurpurea*** (L.) Link  
(Purple cliff-brake) Fern, rare in rock crevices in pinyon-juniper and montane conifer.
  - 3. Leaf stalk reddish-brown; terminal segment of leaflets and leaf axis nearly glabrous; leaf blades 0.7-20 cm long x 0.5-8 cm wide and linear or oval to lance-shaped . . . . . ***P. glabella*** Mett. ex Kuhn **var. *simplex*** Butters  
(Western cliff-brake) Fern, uncom in wetlands (previously reported as var. *occidentalis*).

***Pityrogramma*** (Goldback fern)

***P. triangularis*** (Kaulf.) Maxon (Goldback fern) fern, rare in rock crevices (*Pentagramma triangularis*).

**Ranunculaceae** (Buttercup Family)

- 1. Stem leaves opposite or whorled; petals absent, sepals enlarged and petal-like
  - 2. Stem leaves whorled; sepals 5 or more; plants perennial forbs, stems not vine-like or trailing . . . . . ***Anemone***
  - 2. Stem leaves opposite; sepals usually 4; plants woody vines or trailing perennial forbs . . . . . ***Clematis***
- 1. Stem leaves alternate or leaves all basal or nearly so; petals usually present, if absent the sepals not petal-like
  - 3. Flowers irregular, dark blue or purple
    - 4. Upper sepal spurred at base; petals 4 . . . . . ***Delphinium***
    - 4. Upper sepal not spurred but hooded at apex; petals 2 . . . . . ***Aconitum***
  - 3. Flowers regular, usually yellow, red, or white
    - 5. Petals prominently spurred; perennials . . . . . ***Aquilegia***
    - 5. Petals not spurred or lacking; annuals or perennials
      - 6. Individual flowers with a single pistil; fruit a red or white berry; flowers white . . . . . ***Actaea***
      - 6. Individual flowers with 2 or more pistils or flowers all staminate; fruit a dry achene; flowers white, yellow, or red
        - 7. Leaves simple, linear, margins entire; plants annual; sepals 1-3 mm long with a narrow spur; petals 2-2.5 mm long, often early deciduous . . . . . ***Myosurus***
        - 7. Leaves compound or if simple then toothed or lobed; plants annual or perennial; sepals 2-8 mm long, not spurred; petals absent or over 3 mm long
          - 8. Petals lacking; sepals white or green; flowers unisexual, plants dioecious; leaves ternately compound . . . . . ***Thalictrum***
          - 8. Petals yellow, red, or white; sepals green; flowers bisexual; leaves simple with entire or deeply lobed margins to compound
            - 9. Plants annual; achenes woolly with sharp, spiny beaks; stamens 5-7 . . . . . ***Ceratocephala***
            - 9. Plants perennial; achenes glabrous, without spiny beaks; stamens 10-many . . . . . ***Ranunculus***

***Aconitum*** (Monkshood)

***A. columbianum*** Nutt. **var. *columbianum*** (Columbian monkshood) PerForb, rare montane conifer & wetlands, Jun-Aug.

***Actaea*** (Baneberry)

***A. rubra*** (Ait.) Willd. (Red baneberry) PerForb, uncom in montane conifer & wetlands, May-Aug.



**Anemone** (Globoseflower, Anemone)

1. Plants from tubers; flowers rose-pink, 9-18 mm long . . . . . **A. tuberosa** Rydb.  
(Desert anemone) PerForb, uncom in warm desert & pinyon-juniper, Mar-May.
1. Plants from a caudex; flowers white or yellow, 6-12 mm long . . . . . **A. multifida** Poir.  
(Cutleaf anemone) PerForb, Reported by Welsh (1995) in sagebrush, pinyon-juniper, & montane conifer,  
Jun-Aug. Zion material is probably var. *multifida*.

**Aquilegia** (Columbine)

Hybrids occur among the yellow and red species – these can be recognized by their intermediate flower color and are often glabrate.

1. Flowers blue or white . . . . . **A. coerulea** James  
(Colorado columbine) PerForb, uncom in oak & montane conifer, Jun-Aug.
1. Flowers scarlet, red, or yellow
  2. Flowers uniformly yellow. . . . . **A. chrysantha** Gray  
(Golden columbine) PerForb, uncom in wetlands, May-Jun, hybridizes with *A. fosteri*.
  2. Flowers yellow and red
    3. Flowers as wide as long or wider; leaves mostly glabrous . . . . . **A. formosa** Fisch. ex DC.  
(Western columbine) PerForb, rare in hanging gardens, May-Sep. (*A. formosa* var. *formosa*).
    3. Flowers usually longer than wide; leaves glandular . . . . . **A. fosteri** (Welsh) Welsh  
(Foster's columbine) PerForb, uncom in hanging gardens, May-Aug, type locality is from W of tunnel in Zion NP (*A. formosa* var. *fosteri*).

**Ceratocephala** (Bur buttercup)

**C. testiculata** (Bur buttercup) AnnForb, uncom (but becoming more widespread) in disturbed areas, warm desert, sagebrush, & pinyon-juniper introduced from Eurasia (*Ranunculus testiculatus*).

**Clematis** (Virgin's-bower, Clematis)

1. Flowers solitary; sepals violet blue to lilac, 12-60 mm long; plants perennial herbs with trailing stems . . . . .  
. . . . . **C. columbiana** (Nutt.) Torr. & Gray  
(Columbian virgin's-bower) PerForb, uncom in pinyon-juniper/oak & montane conifer, May-Sep.
1. Flowers few to many in branched clusters; sepals white, 5-8 mm long; plants woody vines . . . . .  
. . . . . **C. ligusticifolia** Nutt.  
(White virgin's-bower) PerForb, uncom in wetlands, Jul-Aug.

**Delphinium** (Larkspur)

1. Leaves mostly borne along the stem, leaf blades 3-16 cm wide and divided into 3 broad lobes, lobes usually over 1 cm wide; stems hollow, often over 1 m tall . . . . . **D. barbeyi** (Huth) Huth  
(Subalpine larkspur) PerForb, rare in pinyon-juniper/oak & montane conifer, Jul-Aug.
1. Leaves mostly at the base of the stem, leaf blades 1-6 cm wide and divided into 3-5 narrow lobes, lobes 0.5 cm or less wide; stems not hollow, less than 1 m tall
  2. Roots tuberous and clustered, readily breaking from the stem; some leaves at base of stem; petals dark blue-purple . . . . . **D. nuttallianum** Pritz.  
(Nuttall's larkspur) PerForb, uncom in warm desert, sagebrush, pinyon-juniper, oak, & montane conifer, Apr-Jul.
  2. Roots not tuberous or clustered, firmly attached to stem; leaves nearly all in a basal rosette; petals deep blue to pale blue . . . . . **D. scaposum** Greene var. **scaposum**  
(Pale larkspur) PerForb, uncom in warm desert, sagebrush, and pinyon-juniper, Apr-Jun (*D. andersonii* var. *scaposum*).

**Myosurus** (Mousetail)

**M. cupulatus** Wats. (Horseshoe mousetail) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Apr-May.

**Ranunculus** (Buttercup)

See *Ceratocephala*

1. Plants aquatic; petals white; submersed leaves divided into linear-filiform segments . . . . .  
. . . . . **R. aquatilis** L. var. **diffusus** With.  
(Thread water-buttercup) PerForb, uncom in wetlands, May-Sep.
1. Plants terrestrial or along margins of wetlands but not submersed; petals yellow or reddish-purple; leaves entire or if lobed or compound not divided into linear-filiform segments

2. Petals and sepals red purple or lined with red purple; leaves twice pinnately compound . . . . . **R. andersonii** Gray var. **tenellus** Wats. (Juniper buttercup) PerForb, uncom in sandy areas and sandstone in pinyon-juniper, oak, & montane conifer, Feb-May (*R. andersonii* var. *juniperinus*). Often the first plant to flower each spring in Zion.
2. Petals yellow; sepals green; leaves entire, crenate, or deeply divided into three main lobes, but not pinnately compound
  3. Plants stoloniferous, stems creeping and rooting at the nodes; leaf blades heart-shaped or truncate at the base and abruptly narrowed to petiole . . . . . **R. cymbalaria** Pursh (Marsh buttercup) PerForb, uncom in wetlands, May-Sep.
  3. Plants not stoloniferous, stems erect and not rooting at the nodes; leaf blades wedge-shaped or tapering at the base and gradually narrowed to the petiole
    4. Basal leaves usually entire or rarely notched once or twice and mitten-shaped; petals 6.5-12 mm long; stems glabrous . . . . . **R. glaberrimus** Hook. var. **ellipticus** (Greene) Greene (Sagebrush buttercup) PerForb, uncom in sagebrush, oak, & montane conifer, Apr-Jun.
    4. Basal leaves with rounded teeth or conspicuously lobed; petals 5-7 mm long; stems hairy or glabrous . . . . . **R. inamoenus** Greene (Drab buttercup) PerForb, rare in pinyon-juniper, oak, & montane conifer, Jun-Sep.

**Thalictrum** (Meadow-rue)

**T. fendleri** Engelm. ex Gray (Fendler's meadow-rue) PerForb, uncom in oak, & montane conifer, Jun-Aug.

**Rhamnaceae** (Buckthorn Family)

**Ceanothus** (Buckthorn, Mountain-lilac)

1. Leaves opposite with pinnate venation . . . . . **C. greggii** Gray var. **vestitus** (Greene) McMinn. (Mohave mountain-lilac) Shrub, uncom in Kolob area in warm desert & pinyon-juniper/oak, Mar-May (*C. vestitus*).
1. Leaves alternate, venation palmate at base
  2. Branches thorny; leaves entire and silvery pubescent beneath . . . . . **C. fendleri** Gray (Fendler's mountain-lilac) Shrub, uncom in pinyon-juniper, oak, and Ponderosa pine forests, Jun-Aug.
  2. Branches not thorny; leaves entire or finely serrate and green beneath . . . . . **C. martini** Jones (Utah mountain-lilac) Shrub, rare in Pinyon-juniper, oak, & montane conifer, Jun-Jul.

**Rosaceae** (Rose Family)

1. Herbs
  2. Flowers lacking petals and borne in dense, cylindrical spikes . . . . . **Sanguisorba**
  2. Flowers typically with petals, borne on separate stalks in loose to somewhat congested panicles or racemes
    3. Leaves pinnately divided into 15-30 pairs of 2-3 lobed leaflets, each less than 6 mm long . . . . . **Ivesia**
    3. Leaves pinnately or palmately divided, usually with 3-15 leaflets (*Potentilla, sensu lato*)
      4. Styles widest at middle and tapering to both ends, usually roughened below, attached near middle or base of ovary; stamens usually 25 . . . . . **Drymocallis**
      4. Styles widest at base or slender throughout, not roughened, attached near the tip of the ovary; stamens usually 20 . . . . . **Potentilla**
1. Shrubs or trees or matted perennial subshrubs
  5. Leaves compound; stems armed with prickles or spines
    6. Petals pink; pistils enclosed within a fleshy hypanthium; fruit a hip . . . . . **Rosa**
    6. Petals white; pistils on an elongate receptacle; fruit an aggregate (raspberry) . . . . . **Rubus**
  5. Leaves simple; stems without prickles or spines
    7. Plants mat-forming, stems prostrate; flowers numerous and clustered in dense spike-like inflorescences; pistils mostly 5, maturing into follicles . . . . . **Petrophyton**
    7. Plants upright shrubs or trees; flowers solitary or in clusters of 2-3 or more in open or dense racemes; pistil single, maturing into an achene, drupe, or pome
      8. Leaves and branches opposite; petals lacking, sepals yellow on inner face and petal-like . . . . . **Coleogyne**
      8. Leaves and branches alternate or leaves clustered on short spur-branches; petals present or if absent sepals not yellow and petal-like
        9. Ovary inferior; fruit an apple-like pome; petals white
        10. Leaves narrowly elliptic to oblanceolate, less than 1 cm wide, margins entire to shallowly toothed; petals broadly oval, 5-10 mm long . . . . . **Peraphyllum**

10. Leaves broadly elliptic to oval, more than 1.5 cm wide, margins with rounded to sharp teeth; petals broadly oval and over 15 mm long or narrowly elliptic and 5-10 mm long
  11. Petals narrowly elliptic, 5-10 mm long; flowers in racemes; leaves blunt or obtuse at tips, not toothed at base . . . . . **Amelanchier**
  11. Petals broadly oval and over 15 mm long; flowers in corymbs or umbels; leaves acute or pointed at tip, toothed at base
    12. Styles separate to the base; fruit a pear, flesh with gritty stone cells. . . . . **Pyrus**
    12. Styles fused above the base into a column; fruit an apple, flesh lacking gritty stone cells . . . . . **Malus**
9. Ovary superior, of 1 to several separate or partially fused pistils each separate from the hypanthium; fruit a drupe, aggregate, achene, follicle, or capsule; petals white, cream, yellow, or absent
  13. Petals lacking, flowers small and inconspicuous in leaf axils; leaves narrow with entire or inrolled margins or broadly oval with shallowly-toothed tips and entire, wedge-shaped bases; fruit an achene with an elongated, persistent, feathery style . . . . . **Cercocarpus**
  13. Petals present, flowers large or conspicuous in terminal clusters; leaves broad, deeply lobed or toothed, maple-like or elliptic; fruit a fleshy drupe, multi-seeded follicle, or achene with or without an elongated, persistent, feathery style
  14. Leaves palmately lobed, widest at base; pubescent with star-shaped hairs; fruit a follicle . . . . . **Physocarpus**
  14. Leaves unlobed but with finely toothed margins and widest at middle, deeply toothed at tip but not divided into palmate segments, or 3-7 times pinnately divided at the tip and tapering to a wedge-shaped base, pubescent with simple hairs; fruit a drupe or achene
    15. Leaves toothed or lobed above the middle or along their entire length, lanceolate, ovate, or oblanceolate, distinctly petiolate
      16. Fruit a fleshy drupe; inflorescence a raceme; petals over 3 mm long . . . . . **Prunus**
      16. Fruit a dry achene; inflorescence a panicle; petals 2.5 mm or less long . . . . . **Holodiscus**
  15. Leaves 3-7 pinnately lobed, narrowly oblanceolate and tapering at the base, but not distinctly petiolate (jointed at the sessile base)
    17. Sepals alternating with sepal-like bractlets; achenes more than 10 per flower, elongate styles pink to purple plumose; flowers on elongate branchlets; plants dioecious; leaves densely yellowish-brown tomentose beneath . . . . . **Fallugia**
    17. Sepals without alternating sepal-like bractlets; achenes 1-10 per flower, elongate styles white-plumose or short and beak-like; flowers on short spur shoots; plants not dioecious; leaves greenish or white tomentose beneath . . . . . **Purshia**

**Amelanchier** (Serviceberry)

1. Leaf blades mainly 2.5-6 cm long, sparsely pubescent to glabrous with age; styles usually 5, united into a column below; petals mostly 9-15 mm long . . . . . **A. alnifolia** (Nutt.) Nutt. (Saskatoon serviceberry) Shrub, uncom in pinyon-juniper, oak, montane conifer, & wetlands, May-Jul.
1. Leaf blades mainly 1-3 cm long, permanently pubescent; styles 2-4 (rarely 5), usually distinct to base; petals 5-10 mm long . . . . . **A. utahensis** Koehne (Utah serviceberry) Shrub, common in sagebrush, pinyon-juniper, oak, montane conifer, & wetlands, Apr-Jun, type locality is Toquerville.

**Cercocarpus** (Mountain mahogany)

1. Leaves deciduous, crenate-serrate toothed, rhombic to obovate, margins not revolute; flowers on a distinct stalk . . . . . **C. montanus** Raf. (Alder-leaf mountain mahogany) Shrub, uncom in pinyon-juniper, sagebrush, oak, & montane conifer, May-Jun.
1. Leaves evergreen, entire, linear to lance-elliptic, margins revolute; flowers nearly sessile
  2. Leaves elliptic, commonly 12-30 mm long or more, margins inrolled less than 1/4 to midrib . . . . . **C. ledifolius** Nutt. in Torr. & Gray **var. intermontanus** N.H. Holmgren (Curl-leaf mountain mahogany) Shrub, uncom in rocky sites in pinyon-juniper/oak & montane conifer, May-Jun, Zion specimens are hybrids with *C. montanus*.
  2. Leaves linear to narrowly oblong, usually less than 12 mm long, margins rolled nearly to midrib . . . . . **C. intricatus** Wats. (Dwarf mountain mahogany) Shrub, common in rock crevices from warm desert to montane conifer zone, Apr-Jun.

**Coleogyne** (Blackbrush)

- C. ramosissima** Torr. (Blackbrush) Shrub, uncom overall, but locally common in warm desert scrub, Apr-Jun.

**Drymocallis** (Wood beauty, Cinquefoil)

1. Inflorescence branches erect; petals yellow; stems densely brown-hairy with bead-like hairs .....  
..... **D. convallaria** (Rydb.) Rydb.  
(Tall cinquefoil) PerForb; uncom in montane conifer in Kolob area, May-Jul (*Potentilla arguta* var.  
*convallaria*).
1. Inflorescence branches spreading; petals yellow or pale yellow; stems sparsely hairy (appearing green) with simple  
hairs ..... **D. pseudorupestris** (Rydb.) Rydb. var. **saxicola** Ertter  
(Sticky cinquefoil) PerForb, uncom in pinyon-juniper, oak, & montane conifer, Jun-Aug (*Potentilla*  
*glandulosa* var. *pseudorupestris*).

**Fallugia** (Apache plume)

**F. paradoxa** (D. Don) Endl. (Apache plume) Shrub, uncom in warm desert, sagebrush, pinyon- juniper, &  
wetlands, Apr-Aug.

**Holodiscus** (Oceanspray)

**H. dumosus** (Nutt. ex Hook.) Heller (Bush oceanspray) Shrub, uncom in rock crevices in pinyon-juniper, oak, &  
montane conifer, Jun-Aug.

**Ivesia** (Ivesia)

**I. sabulosa** (Sevier ivesia) PerForb, uncom in sandstone rock crevices in pinyon-juniper & montane conifer, Jun-  
Aug.

[**I. arizonica** (Eastw. ex Howell) Ertter var. **arizonica** (Yellow purpusia) is reported from the Kolob Plateau in Washington  
County, Utah by Ertter and Reveal in Vol 9 of *The Flora of North America* (2014) and may occur in Zion NP. This species can be  
distinguished from *I. sabulosa* by having 4-5 pairs of broad leaflets per leaf rather than 15-40 pairs of tiny, wedge-shaped leaflets].

**Malus** (Apple)

**M. pumila** Miller (Common apple) Tree, uncom, introduced (*Pyrus malus*). Cultivated. May.

**Peraphyllum** (Squaw-apple)

**P. ramosissimum** Nutt. in Torr. & Gray (Squaw-apple) Shrub, uncom in sagebrush, pinyon-juniper, oak, and  
montane conifer, often on Carmel soils, May-Jun.

**Petrophyton** (Rock spiraea)

**P. caespitosum** (Nutt.) Rydb. (Rock spiraea) PerForb, uncom on Navajo slickrock in pinyon-juniper & montane  
conifer, Aug-Sep.

**Physocarpus** (Ninebark)

**P. alternans** (Jones) Howell (Dwarf ninebark) Shrub, uncom in rock crevices from warm desert to montane conifer  
zone, May-Aug.

**Potentilla** (Cinquefoil)

See *Drymocallis*

1. Basal leaves palmately compound with 5-7 leaflets; leaves green above and white-tomentose beneath .....  
..... **P. gracilis** Dougl. ex Hook. var. **pulcherrima** (Lehm.) Fern.  
(Beautiful cinquefoil) PerForb, uncom in pinyon-juniper, oak, & montane conifer, Jun-Aug.
1. Basal leaves pinnately compound with 5-13 leaflets; leaves silvery-pubescent on both sides ... **P. hippiana** Lehm.  
(Woolly cinquefoil) PerForb, rare montane conifer, Jul-Aug.

**Prunus** (Cherry)

1. Inflorescence of more than 15 flowers in a dense, elongate raceme .....  
..... **P. virginiana** L. var. **melanocarpa** (A. Nels.) Sarg.  
(Western chokecherry) Shrub, uncom in pinyon-juniper, oak, montane conifer, & wetlands, May-Jul.
1. Flowers occur singly or in umbel-like clusters of fewer than 15
  2. Leaves entire or toothed only at the tip, borne in fascicles, each leaf less than 6 mm wide; drupe egg-shaped to  
nearly round, 7-12 mm long, yellowish-brown hairy ..... **P. fasciculata** (Torr.) Gray  
(Desert almond) Shrub, Reported by Welsh (1995) in warm desert, Apr-May.
  2. Leaves elliptic, lance-shaped, or oval, margins entire or toothed throughout, leaves alternate or clustered on spur  
shoots, over 10 mm wide; drupe broadly oval to round, over 12 mm long, glabrous or if pubescent not  
yellowish-brown
  3. Flowers in groups of 2-3 or more and borne on elongate stalks over 10 mm long; drupe glabrous .....  
..... **P. avium** (L.) L.  
(Sweet cherry) Tree, uncom, cultivated, native to Eurasia. Apr-May.

3. Flowers occur singly (occasionally in groups of 2-3 in *P. domestica*) on short stalks less than 10 mm long; drupes glabrous to pubescent
4. Drupes glabrous; leaves pubescent beneath on surface and veins; sepals glabrous or pubescent . . . . . ***P. domestica*** L.  
(Common plum) Tree, Reported (Welsh 2007) from cultivation, native to Eurasia, May.
4. Drupes pubescent; leaves glabrous beneath or pubescent only on veins; sepals glandular or pubescent only on margins
5. Leaves broadly ovate . . . . . ***P. armeniaca*** L.  
(Apricot) Tree, rare, cultivated, Native to China, Mar-Apr.
5. Leaves narrowly lance-shaped
  6. Flowers white to pale pink; leaf teeth rounded; fruit leathery, splitting at maturity to expose the stone . . . . . ***P. dulcis*** (Miller) Webb  
(Almond) Tree, rare, cultivated, native to Old World, Apr-May.
  6. Flowers deep pink; leaf teeth sharp-pointed; fruit fleshy, not splitting at maturity to expose the stone . . . . . ***P. persica*** (L.) Batsch.  
(Peach) Tree, rare, cultivated, native to China, Apr-May.

***Purshia*** (Bitterbrush, Cliff-rose)

1. Styles elongated and feathery on the achenes; pistils 4-12 per flower . . . . . ***P. mexicana*** (D. Don) Welsh **var. *stansburyana*** (Torr.) Welsh  
(Cliff-rose) Shrub, uncom in warm desert, sagebrush, pinyon-juniper/oak, & montane conifer, May-Jun (*P. stansburiana*, *P. stansburyana*).
1. Styles beak-like, not elongated and feathery on the achenes; pistils typically 1, sometimes 2-3 per flower
  2. Leaves prominently glandular but glabrous on upper surface; flowers creamy white to yellowish . . . . . ***P. glandulosa*** Curran  
(Desert bitterbrush) Shrub, Reported (Fertig & Alexander 2009) in warm desert & pinyon-juniper, Apr-May.
  2. Leaves not glandular but pubescent on upper surface; flowers yellow . . . . . ***P. tridentata*** (Pursh) DC.  
(Antelope bitterbrush) Shrub, common in sandy areas in pinyon-juniper, sagebrush, oak, and montane conifer, Apr-Jul.

***Pyrus*** (Pear)

***P. communis*** L. (Common pear) Tree, rare, cultivated, native to Eurasia, Apr-May.

***Rosa*** (Rose)

***R. woodsii*** Lindl. (Woods' rose) Shrub, uncom in pinyon-juniper, sagebrush, oak, montane conifer, & wetlands, May-Jul (large flowered plants approach *R. nutkana* Presl).

***Rubus*** (Blackberry, Raspberry)

1. Prickles of stems and leafstalks backwards-curved or cat claw-like; stems erect and arching but not trailing or clambering; berries (technically drupelets) slip free from the receptacle when ripe . . . . . ***R. leucodermis*** Dougl. ex Torr. & Gray  
(Western blackberry) Shrub, uncom in oak & wetland sites, Jun-Jul.
1. Prickles of stems straight, stout; stems sprawling or clambering; berries adhere to the fleshy receptacle when ripe . . . . . ***R. discolor*** Weihe & Nees  
(Himalayan blackberry) Shrub, uncom in South campground, introduced from Eurasia, Jun-Sep.

***Sanguisorba*** (Burnet)

***S. minor*** Scop. (Garden burnet) PerForb, rare in disturbed areas & montane conifer, May-Jun. Introduced from Europe (*Poterium sanguisorba* var. *polygamum*).

**Rubiaceae** (Madder Family)

1. Leaves paired and opposite; corolla tube elongate . . . . . ***Kelloggia***
1. Leaves whorled; corolla tube short
  2. Corolla 3-4 lobed; fruit dry, glabrous, or hairy with straight or hooked bristles . . . . . ***Galium***
  2. Corolla 5-lobed; fruit fleshy, glabrous . . . . . ***Rubia***

***Galium*** (Bedstraw)

1. Leaves in whorls of 5-8
  2. Ovary and fruit glabrous; leaves blunt or rounded at tip . . . . . ***G. trifidum*** L.  
(Small bedstraw) PerForb, uncom in wetlands, Jul-Aug.
  2. Ovary and fruit bristly hairy; leaves acute or bristle-tipped

- 3. Perennial forbs; leaves ovate-oblong to broadly obovate, 7-13 mm broad . . . . . **G. triflorum** Michx.  
(Sweet-scented bedstraw) PerForb, uncom in wetlands, Jul-Aug.
- 3. Annual forbs; leaves linear to narrowly oblong or oblanceolate, mainly 3-5 mm broad . . . . .  
. . . . . **G. aparine** L. var. **echinospermum** (Wallr.) Farw.  
(Cleavers) AnnForb, uncom in warm desert, sagebrush, pinyon-juniper/oak, montane conifer, & wetlands,  
Apr-Jun.
- 1. Leaves mostly in whorls of 2-4
- 4. Annual forb; stems 5-20 cm tall . . . . . **G. bifolium** Wats.  
(Twin-leaf bedstraw) AnnForb, rare in pinyon-juniper/oak, sagebrush, & montane conifer, May-Aug.
- 4. Shrubs or perennial forbs; stems over 30 cm tall
- 5. Corolla purple to brown; both stamens and carpels in the same flower; hairs of fruit mostly 0.5-1 mm long . . . . .  
. . . . . **G. wrightii** Gray  
(Wright's bedstraw) PerForb, uncom montane conifer & wetlands, Jul-Sep.
- 5. Corolla white; stamens and carpels found in separate, unisexual flowers; hairs of fruit mostly 1.5-2.5 mm long . .  
. . . . . **G. multiflorum** Kell. var. **multiflorum**  
(Shrubby bedstraw) PerForb, uncom in rocky areas in warm desert, pinyon-juniper, oak, montane conifer, &  
wetlands, May-Aug.

**Kelloggia** (Kelloggia)

**K. galioides** Torr. in Wilkes (Milky kelloggia) PerForb, uncom in pinyon-juniper, oak, & montane conifer, Jun-Aug.

**Rubia** (Madder)

**R. tinctorum** L. (Madder) PerForb, uncom in disturbed areas, introduced from Europe, Jun-Sep.

**Salicaceae** (Willow Family)

- 1. Bud scales 2 or more; flower bracts (scales) subtending flowers usually fringed; catkins mostly drooping; stamens  
6 to many . . . . . **Populus**
- 1. Bud scales 1; flower bracts (scales) subtending flowers usually entire; catkins mostly erect to spreading; stamens  
2-8 . . . . . **Salix**

**Populus** (Cottonwood)

- 1. Leaves maple-like with 3-5 lobes, white-woolly below . . . . . **P. alba** L.  
(White poplar) Tree, Reported by Fertig and Alexander (2009) from cultivation. Native to Europe, Mar-Jun.
- 1. Leaves not maple-like, margins entire or shallowly lobed or toothed, green below
- 2. Leaf blades lance-shaped; petioles usually not flattened . . . . . **P. angustifolia** James ex Torrey  
(Narrow-leaved cottonwood) Tree. Reported by Weight (1937) from wetland areas. Apr-Jun.
- 2. Leaf blades suborbicular or cordate to deltoid; petioles strongly flattened below the leaf blade
- 3. Leaf blades nearly round or heart-shaped; bark whitish and smooth . . . . . **P. tremuloides** Michx.  
(Quaking aspen) Tree, uncom in montane conifer and wetland areas. Mar-Jun.
- 3. Leaf blades broadly triangular; bark dark, rough . . . . . **P. fremontii** Watson var. **fremontii**  
(Fremont cottonwood) Tree, common in wetlands. Mar-Jun. (*P. deltoides* var. *fremontii*).

**Salix** (Willow)

- 1. Plants with pistillate catkins
- 2. Flower bracts yellow, green, or tan, deciduous when fruits are mature; tall shrubs or trees
- 3. Capsules glabrous; leaf blades broadly lance-shaped to ovate, mostly 4 times or less longer than wide, gradually  
tapering to an elongate tip
- 4. Bud scales with free, overlapping margins on the side toward the branchlet; petioles without conspicuous  
glands at the base of the leaf blade; plants trees . . . . . **S. laevigata** Bebb  
(Red willow) Shrub, uncom, Apr-May.
- 4. Bud scales cap-like, without free, overlapping margins; petioles with conspicuous glands at the base of the leaf  
blade; plants tall shrubs . . . . . **S. lucida** Muhl. ssp. **caudata** (Nutt.) Argus  
(Whiplash willow) Shrub, uncom in wetlands, Apr-Jun.
- 3. Capsules glabrous or pubescent; leaf blades linear to narrowly lance-linear, more than 5 times longer than  
wide, not gradually tapering to an elongate tip
- 5. Bud scales with free, overlapping margins on the side toward the branchlet; trees or occasionally single-  
stemmed shrubs 6-10 m tall . . . . . **S. gooddingii** Ball  
(Goodding's black willow) Tree, uncom in wetland areas, Apr-May.

5. Bud scales cap-like, without free, overlapping margins; rhizomatous and colonial-forming shrubs mostly 2-3 m tall ..... ***S. exigua*** Nutt. **var. *stenophylla*** (Rydb.) Schneid. (Coyote willow) Shrub, locally common in wetlands, Apr-Aug.
2. Flower bracts dark brown, black, or reddish (rarely yellowish in *S. geyeriana*), persistent when fruits are mature; low to tall shrubs
6. Capsules glabrous
  7. Lower leaf surface not glaucous, lower and upper leaf surfaces equally green ..... ***S. boothii*** Dorn (Booth's willow) Shrub, rare in wetlands, May-Jun.
  7. Lower leaf surface glaucous or lighter-colored than the upper leaf surface
    8. Leaves pubescent on lower surface at maturity, blades usually oblong to oblanceolate ..... ***S. lasiolepis*** Benth. (Arroyo willow) Shrub, uncom, Apr-May.
    8. Leaves glabrous on lower surface at maturity, blades usually elliptic or lanceolate ..... ***S. eriocephala*** Michx. **var. *watsonii*** (Bebb) Dorn (Yellow willow) Shrub, uncom in wetlands, Apr-Aug (*S. lutea*).
6. Capsules pubescent
  9. Year-old twigs glaucous or pruinose (with a waxy bloom that can be rubbed off); leaf blades elliptic to lance-shaped, less than 1.5 cm wide; pistillate catkins 1-2.5 cm long, loosely flowered, appearing with or after the leaves emerge, usually on a short, leafy branch ..... ***S. geyeriana*** Anderss. (Geyer's willow) Shrub, rare in wetlands, May-Jun.
  9. Year-old twigs not glaucous or pruinose; leaf blades broadly oblanceolate to obovate, usually over 1.5 cm wide; pistillate catkins 1.5-8 cm long, densely flowered, appearing before the leaves emerge, usually sessile .. ***S. scouleriana*** Barr. ex Hook. (Scouler's willow) Shrub, uncom, Apr-Jun.
1. Plants with staminate catkins or vegetative (see preceding couplets for additional data on each species)
  10. Mature leaf blades linear, linear-elliptic, or narrowly lance-linear, more than 5 times as long as wide (young leaves on sucker shoots may be considerably wider)
    11. Bud scales with free, overlapping margins on the side toward the branchlet; trees or occasionally single-stemmed shrubs 6-10 m tall ..... ***S. gooddingii*** Ball
    11. Bud scales cap-like, without free, overlapping margins; rhizomatous and colonial-forming shrubs mostly 2-3 m tall ..... ***S. exigua*** Nutt. **var. *stenophylla*** (Rydb.) Schneid.
  10. Mature leaf blades elliptic to ovate or obovate, less than 5 times as long as wide
    12. Leaves not glaucous, equally green on both surfaces or nearly so; dense hairs never obscuring the lower surface
      13. Leaf blades long-acuminate; petioles with small glands near the base of the blade ..... ***S. lucida*** Muhl. **ssp. *caudata*** (Nutt.) Argus
      13. Leaf blades acute but not long-acuminate; petioles lacking glands ..... ***S. boothii*** Dorn
    12. Leaves glaucous below or with dense hairs obscuring the lower surface
      14. First and second year branchlets glaucous or pruinose (with a waxy bloom that can be rubbed off) ..... ***S. geyeriana*** Anderss.
      14. First and second year branchlets not glaucous or pruinose
        15. Leaf blades broadly oblong or oblanceolate, widest above the middle and tapering to the base, leaf tip blunt to rounded, not tapering to an elongated point
          16. Leaf blades mostly 2-3 times longer than wide, usually over 15 mm wide, margins usually entire; freshly peeled bark has skunky odor ..... ***S. scouleriana*** Barr. ex Hook.
          16. Leaf blades mostly 3-5 times longer than wide, usually less than 15 mm wide, margins often finely toothed; freshly peeled bark not skunky odored ..... ***S. lasiolepis*** Benth.
        15. Leaf blades broadly lance-shaped, widest below the middle or near the base, leaves gradually tapering to an elongate, pointed tip
          17. Bud scales with free, overlapping margins on the side toward the branchlet ..... ***S. laevigata*** Bebb
          17. Bud scales cap-like, without free, overlapping margins ..... ***S. eriocephala*** Michx. **var. *watsonii*** (Bebb) Dorn

### Santalaceae (Sandalwood Family)

Includes Viscaceae

1. Plants terrestrial and half-parasitic; stems green; leaves well-developed and green; flowers white, showy ..... ***Comandra***
1. Plants epiphytic and parasitic; not rooted in soil at maturity; stems yellowish-brown to orange or whitish; leaves reduced to scales or absent; flowers yellowish-green, not showy
2. Perianth of pistillate flowers 2-lobed; fruits flattened and on recurved pedicels; anthers 1-loculed; parasitic on *Pinus*, *Pseudotsuga*, or *Abies* ..... ***Arceuthobium***

2. Perianth of pistillate flowers 3-lobed; fruits globose and sessile; anthers 2-loculed; parasitic on *Juniperus osteosperma* . . . . . **Phoradendron**

**Arceuthobium** (Dwarf mistletoe)

1. Shoots scattered along the host stem rather than clustered, each shoot mostly 0.5-3 cm tall; parasitic mostly on *Pseudotsuga* or *Abies* . . . . . **A. douglasii** Engelm. (Douglas-fir dwarf-mistletoe) PerForb, Reported by Nelson (1976) in montane conifer, Mar-May.
1. Shoots clustered on the host stem, each shoot over 5 cm tall; parasitic mostly on *Pinus* (parasitic on *Abies* in *A. abietinum*)
2. Shoots 10-20 cm tall, yellowish-green; plants flowering in late summer (August-September); parasitic on *Abies* . . . . . **A. abietinum** Engelm. ex Munz (Fir dwarf-mistletoe) PerForb; rare, montane conifer, Aug-Sep.
2. Shoots 5-10 cm tall, orange or olive-green; plants flowering in spring, summer, or fall; parasitic on *Pinus*
3. Shoots orange; plants flowering in spring (May-June); parasitic mostly on *Pinus ponderosa* . . . . . **A. vaginatum** (Willd.) Presl **var. cryptopodum** (Engelm.) Cronq. (Southwestern dwarf-mistletoe) PerForb, uncom in Ponderosa pine forest, May-Jun.
3. Shoots olive-green; plants flowering in summer and fall (July or later); parasitic mostly on *Pinus edulis* or *P. monophylla* . . . . . **A. divaricatum** Engelm. (Pinyon dwarf-mistletoe) PerForb, uncom in pinyon-juniper, Jul-Sep.

**Comandra** (Bastard toadflax)

- C. umbellata** (L.) Nutt. **var. pallida** (A. DC.) Jones (Bastard toadflax) PerForb, uncom in warm desert, sagebrush, pinyon-juniper/oak, & montane conifer, Apr-Aug.

**Phoradendron** (Mistletoe)

- P. juniperinum** Gray (Juniper mistletoe) PerForb, uncom in pinyon-juniper, Jul-Sep.

**Sapindaceae or Aceraceae** (Maple Family)

**Acer** (Maple)

1. Leaves compound
2. Leaves palmately compound with 3 leaflets, terminal leaflet sessile . . . . . **A. glabrum** Torrey **var. glabrum** (Rocky Mountain maple) Shrub, uncom in mountain shrub and pinyon-juniper, oak, & sagebrush, Apr-Jun.
2. Leaves pinnately compound with 3-7 leaflets, terminal leaflet stalked . . . . . **A. negundo** L. (Box-elder) Tree, common in wetland areas, Apr-Jun.
1. Leaves simple
3. Leaves glabrous, finely toothed on margins; sepals distinct, glabrous; petals usually present . . . . . **A. glabrum** Torrey **var. glabrum** (see couplet 1)
3. Leaves pubescent beneath, coarsely few toothed on margins; sepals connate, pubescent; petals absent . . . . . **A. grandidentatum** Nuttall in Torrey & Gray (Bigtooth maple) Small tree or large shrub, locally common in pinyon-juniper, oak, & mountain shrub, often in shady canyons. Apr-May.

**Sarcobataceae** (Greasewood Family)

Formerly included in Chenopodiaceae (now Amaranthaceae)

**Sarcobatus** (Greasewood)

- S. vermiculatus** (Hooker) Torrey in Emory (Greasewood) Shrub, uncom in desert scrub off Chinle Trail, May-Jul.

**Saxifragaceae** (Saxifrage Family) *sensu stricto*

see also Celastraceae, Grossulariaceae, & Hydrangeaceae

1. Leaves basal and on stem, parted or divided nearly to midrib . . . . . **Lithophragma**
1. Leaves all basal, entire or lobed or toothed on margins but not divided nearly to midrib
2. Leaves crenate-toothed and lobed; stamens 5 . . . . . **Heuchera**
2. Leaves subentire or crenate-toothed but not lobed; stamens 10 . . . . . **Saxifraga**



**Heuchera** (Alumroot)

- 1. Stamens shorter than the sepals; petals ca 1-2 mm long; sepals yellowish, not pink or reddish; flower stalks less than 2 mm long . . . . . **H. parvifolia** Nutt. in Torr. & Gray (Littleleaf alumroot) PerForb, rare on rocky ledges in pinyon-juniper, oak, & montane conifer, May-Sep.
- 1. Stamens exserted 1-4 mm beyond the sepals; petals 3-4 mm long; sepals pinkish or reddish; flower stalks 2-7 mm long . . . . . **H. rubescens** Torr. **var. versicolor** (Greene) Stewart (Hairy alumroot) PerForb, common on rocky ledges in pinyon-juniper, oak, & montane conifer, Apr-Sep.

**Lithophragma** (Woodland-star)

- 1. Plants with reddish-purple bulblets in the inflorescence and often in axils of upper leaves . . . . . **L. glabrum** Nutt. in Torr. & Gray **var. ramulosum** (Suksd.) Boivin (Fringecup woodlandstar) PerForb, uncom in pinyon-juniper, oak, sagebrush, montane conifer, & wetlands, Mar-Aug.
- 1. Plants without reddish-purple bulblets in the inflorescence and axils of upper leaves . . . . . **L. tenellum** Nutt. in Torr. & Gray (Slender woodlandstar) PerForb, uncom in pinyon-juniper, oak, sagebrush, montane conifer, & wetlands, Apr-Aug.

**Saxifraga** (Saxifrage)

**S. rhomboidea** Greene (Diamondleaf saxifrage) PerForb, uncom in montane conifer, May-Sep.

**Scrophulariaceae** (Figwort Family)

Most genera transferred to Orobanchaceae, Phymaceae & Plantaginaceae

**Verbascum** (Mullein)

**V. thapsus** L. (Woolly mullein) PerForb, introduced from Eurasia, common in disturbed areas, Jun-Aug.

**Selaginellaceae** (Spikemoss Family)

**Selaginella** (Spikemoss)

- 1. Stems elongate and ropy, not densely matted; leaves with a terminal white hair 0.3-0.9 mm long . . . . . **S. underwoodii** Hier. ex Heller (Underwood's spikemoss) Fern, uncom in rocky areas
- 1. Stems short, densely matted; leaves without a terminal white hair, or 0.1-0.5 mm long
  - 2. Terminal white hair of leaf absent or less than 0.2 mm long . . . . . **S. utahensis** Flowers (Utah spikemoss) Fern, uncom on Navajo slickrock in shady canyons. Type locality from Zion NP.
  - 2. Terminal white hair present, 0.2-0.5 mm long . . . . . **S. watsonii** Underw. (Watson's spikemoss) Fern; Reported by Ott (2010) from rocky areas.

**Simaroubaceae** (Quassia Family)

**Ailanthus** (Tree-of-Heaven)

**A. altissima** (Mill.) Swingle (Tree-of-Heaven) Tree, introduced from China, uncom in disturbed areas, Jun-Jul.

**Solanaceae** (Potato Family)

- 1. Plants spiny shrubs; leaves fleshy and borne in fascicles on older branches or often drought-deciduous, blades entire . . . . . **Lycium**
- 1. Plants herbaceous perennials or annuals, not spiny; leaves usually not fleshy, not borne in fascicles in woody branches, not drought-deciduous, blades usually shallowly lobed or toothed, occasionally entire
  - 2. Corolla trumpet-shaped with an elongate, narrow tube; fruit a capsule
    - 3. Corolla at least 8 cm long, broadly funnel-shaped; flowers solitary; fruit spiny . . . . . **Datura**
    - 3. Corolla less than 5 cm long, narrowly trumpet-shaped; flowers in a raceme or panicle; fruit not spiny . . . . . **Nicotiana**
  - 2. Corolla wheel-shaped with scarcely any tube (rotate) or with a broad, bell-shaped tube (campanulate); fruit a berry

4. Calyx not enlarging at maturity, not enclosing or concealing the fruit; stamens forming a ring around the style (connivent) ..... **Solanum**
4. Calyx becoming enlarged at maturity, enclosing and concealing the fruit; stamens not forming a ring around the style
5. Calyx becoming membranous-inflated and conspicuously veiny at maturity, loosely enclosing the fruit; corolla 10-20 mm wide, yellow with brown or purple spots, usually lacking tomentose pad-like fornices at the base of the stamens ..... **Physalis**
5. Calyx herbaceous, not inflated or conspicuously veiny at maturity, closely covering most of the fruit; corolla mostly 6-10 mm wide, pale green or greenish-white (sometimes with purplish blotches), with tomentose pad-like fornices at the base of the stamens ..... **Chamaesaracha**

**Chamaesaracha** (False nightshade)

**C. coronopus** (Dunal) Gray (False nightshade) PerForb, rare in warm desert & sagebrush, Apr-Jul.

**Datura** (Jimsonweed, Sacred datura)

**D. wrightii** Regel (Angel's trumpet) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Apr-Oct.

**Lycium** (Wolfberry)

1. Calyx tube 2.5-4 mm long, calyx lobes as long to twice as long as the tube; corolla greenish with purple or brown veins, tube 8-18 mm long, lobes 3-5 mm long ..... **L. pallidum** Miers (Pale wolfberry) Shrub, uncom in warm desert & pinyon-juniper, Mar-May.
1. Calyx tube often less than 2.5 mm long, calyx lobes usually less than 2/3 as long as the tube; corolla white to yellowish with bluish lobes, tube rarely more than 8 mm long, lobes mostly less than 3 mm long ..... **L. andersonii** Gray (Anderson's wolfberry) Shrub, uncom in warm desert & pinyon-juniper, Feb-May.

**Nicotiana** (Tobacco)

1. Leaves petiolate, not cordate or auriculate-clasping at the base; corolla externally glabrous or sparingly pubescent ..... **N. attenuata** Torr. ex Wats. (Coyote tobacco) AnnForb, uncom in warm desert, sagebrush, & pinyon-juniper, Jun-Sep.
1. Leaves cordate and sessile or auriculate clasping at the base; corolla very pubescent externally ..... **N. trigonophylla** Dunal (Desert tobacco) AnnForb, uncom in rock crevices in warm desert, Mar-Oct (*N. obtusifolia*).

**Physalis** (Ground-cherry)

1. Leaf blades narrow, mostly 2.5-5 times as long as wide, tapered gradually at both ends, sparsely pubescent with simple hairs, never glandular ..... **P. longifolia** Nutt. (Long-leaf ground-cherry) PerForb, rare in sagebrush & pinyon-juniper, Apr-Aug.
1. Leaf blades ovate to oblong, mostly 1.5-2 times as long as wide, tapering abruptly at the base, pubescent with simple or forked glandular hairs or non-glandular hairs ..... **P. hederifolia** Gray
2. Hairs mostly forked, not glandular ..... **var. fendleri** (Gray) Cronq. (Fendler's ground-cherry) PerForb, uncom in sagebrush & pinyon-juniper, May-Oct.
2. Hairs simple, gland-tipped ..... **var. palmeri** (Gray) C.L. Hitchc. (Palmer's ground-cherry) PerForb, uncom in warm desert, sagebrush, pinyon-juniper/oak, montane conifer, & wetlands, May-Oct.

**Solanum** (Nightshade)

1. Plants spiny, pubescent with dense layer of appressed, non-glandular stellate hairs; flowers blue or purple ..... **S. elaeagnifolium** Cav. (Silverleaf nightshade) PerForb, common in Zion Canyon, introduced (native to central North America), uncom in warm desert, sagebrush, oak, disturbed areas, Apr-Aug.
1. Plants lacking spines, pubescence not stellate; flowers white or greenish-white
2. Leaves either deeply pinnately lobed or compound. .... **S. triflorum** Nutt. (Cut-leaf nightshade) AnnForb, uncom in warm desert & pinyon-juniper, May-Sep.
2. Leaves entire or shallowly toothed
3. Stems and leaves nearly glabrous or with non-glandular spreading hairs; fruits black ..... **S. nigrum** L. (Black nightshade) AnnForb, uncom, introduced from Europe, uncom in disturbed areas, Jul-Oct.
3. Stems and leaves glandular; fruits yellow when mature ..... **S. sarrachoides** Sendt. ex Martius (Ground-cherry nightshade) AnnForb, introduced from South America, reported (Welsh 1995), from disturbed areas, May-Oct.

**Tamaricaceae** (Tamarisk Family)

**Tamarix** (Tamarisk, Salt-cedar)

**T. chinensis** Lour. (Five-stamen tamarisk) Shrub, formerly common in wetlands, Apr-Sep, introduced from Eurasia.

**Typhaceae** (Cattail Family)

**Typha** (Cattail)

1. Pistillate (lower) portion of spike dark brown, contiguous with staminate (upper) portion; pistillate flowers lacking subtending bracts; stigmas dilated at tip and dark brown . . . . . **T. latifolia** L. (Broad-leaved cattail) PerGram, uncom in wetlands, Jun-Aug.
1. Pistillate portion of spike pale to cinnamon brown, separated from the staminate portion by 1.3-2.5 cm; pistillate flowers with subtending bracts; stigmas not dilated at tip and pale brown . . . . . **T. domingensis** Pers. (Southern cattail) PerGram, uncom in wetlands, Jun-Aug.

**Ulmaceae** (Elm Family)

See Cannabaceae for *Celtis*

**Ulmus** (Elm)

**U. pumila** L. (Siberian elm) Tree, introduced from Asia, uncom in pinyon-juniper woods and disturbed areas, Mar-Apr.

**Urticaceae** (Nettle Family)

1. Plants without stinging hairs; leaves alternate, entire . . . . . **Parietaria**
1. Plants with stinging hairs; leaves opposite, toothed . . . . . **Urtica**

**Parietaria** (Pellitory)

**P. pennsylvanica** Muhl. ex Willd. (Pennsylvania pellitory) AnnForb, uncom in warm desert, Mar-Aug.

**Urtica** (Nettle)

**U. dioica** L. (Stinging nettle) PerForb, uncom along Wildcat Trail (photographed by Derrick Zobell in 2012), May-Aug. Variety not determined.

**Verbenaceae** (Vervain Family)

**Verbena** (Vervain)

**V. bracteata** Lag. & Rodr. (Prostrate vervain) PerForb, uncom in disturbed areas, May-Sep.

**Violaceae** (Violet Family)

**Viola** (Violet)

1. Petals yellow on inner surface, sometimes purplish below; leaves glabrous or pubescent, often with backward-pointing hairs
2. Leaf blades as broad as long and round-toothed on the margins, surface gray and covered with short, backward-pointing hairs . . . . . **V. purpurea** Kell. var. **charlestonensis** (Baker & Clausen) Welsh & Reveal (Charleston Mountain violet) PerForb, uncom on Carmel limestone outcrops in montane conifer, May-Aug (**V. charlestonensis**).
2. Leaf blades much longer than broad, entire or with teeth near the tip, leaves glabrous or hairy and green in appearance . . . . . **V. praemorsa** (Dougl.) Wats. (Upland yellow violet) PerForb; uncom in Kolob area in montane conifer, Jun-Jul.
1. Petals blue, purple, or white on inner surface; leaves glabrous or if hairs present, these not backward-pointing
3. Petals white or blue; at least some leaves present on an elongated stem; flower stalks arising from stem
4. Petals white with a yellow base (sometimes with blush of purple), spur 0.5-1.3 mm long; stipules entire . . . . . **V. canadensis** L. (Canadian white violet) PerForb, uncom in pinyon-juniper, oak, & montane conifer, Apr-Aug.

4. Petals blue (Zion plants often pale and whitish), spur 3.5 mm or more long; stipules toothed . . . . . **V. *adunca*** J.E. Smith ex Rees.  
(Hook-spur violet) PerForb; rare on East Rim Trail in montane conifer, May-Jul.
3. Petals blue; leaves all borne at base of plant, stems essentially lacking; flower stalks arising from basal rosette of leaves
  5. Leaves about as long as wide; lower petals with long hairs (bearded) near the base . **V. *nephrophylla*** Greene  
(Northern bog violet) PerForb, uncom in wetlands, Apr-Jul.
  5. Leaves longer than wide; all petals glabrous . . . . . **V. *clauseniana*** Baker  
(Clausen's violet) PerForb, rare in hanging gardens, May-Jun. Type locality from Zion NP.

### Vitaceae (Grape Family)

1. Leaves palmately compound . . . . . ***Parthenocissus***
1. Leaves simple but palmately veined and lobed . . . . . ***Vitis***

#### ***Parthenocissus*** (Virginia creeper)

***P. quinquefolia*** (L.) Planchon in A. DC. Uncom in housing area, escaped from cultivation, May-Jul.

#### ***Vitis*** (Grape)

1. Bark shredding; skin of fruit easily slides loose from pulp . . . . . ***V. arizonica*** Engelm.  
(Canyon grape) Shrub, locally common in wetlands, May-Jun.
1. Bark not shredding; skin of fruit does not slide easily loose from pulp . . . . . ***V. vinifera*** L.  
(Wine grape) Shrub, introduced from Eurasia, uncom, cultivated, May-Jun.

### Zygophyllaceae (Caltrop Family)

1. Woody shrubs to 3 m tall; leaves of 2 leathery, resinous leaflets; fruit hairy, globe-shaped . . . . . ***Larrea***
1. Annual, prostrate-spreading herbs; leaves pinnately compound with 3-8 pairs of leaflets; fruits armed with spines and splitting into 2-5 hardened nutlets . . . . . ***Tribulus***

#### ***Larrea*** (Creosote bush)

***L. tridentata*** (DC.) Cov. (Creosote bush) Shrub, rare in warm desert scrub, Apr-Jun.

#### ***Tribulus*** (Puncture vine, Goatshead)

***T. terrestris*** L. (Puncture vine) AnnForb, uncom in disturbed areas, introduced from Eurasia, May-Sep.

## Appendix 1. Revisions to the Flora of Zion National Park

Nomenclature Changes since the publication of *Annotated Checklist of Vascular Flora, Zion National Park* by Fertig and Alexander (2009) and draft *Flora of Zion* (Fertig 2012).

*Abronia fragrans* (Nyctaginaceae) renamed *Abronia fragrans* var. *elliptica* following FNA

Aceraceae transferred to Sapindaceae following APG III

*Adiantum* transferred from Polypodiaceae to Pteridaceae following FNA

*Aegilops cylindrica* (Poaceae) new to Zion NP

Agavaceae transferred to Asparagaceae following APG III

Aizoaceae transferred to Molluginaceae following APG III

*Allium* transferred from Liliaceae to Amaryllidaceae following APG III

*Alyssum parviflorum* var. *micranthum* (Brassicaceae) renamed *A. simplex* following FNA

*Amauriopsis dissecta* (Asteraceae) new to Zion NP, discovered by Fertig and Ott

*Ambrosia confertiflora* (Asteraceae) new to Zion NP discovered by NPS Resource staff

*Andropogon gerardii* var. *chrysocomus* (Poaceae) renamed *Andropogon hallii* following FNA

*Arabis demissa*, *A. drummondii*, *A. holboellii*, *A. perennans*, & *A. pulchra* transferred to *Boechera* following Intermountain Flora and FNA.

*Aristida purpurea* (Poaceae) divided into 3 varieties: *fendleriana*, *longiseta*, *nealleyi* following FNA

*Artemisia carruthii* (Asteraceae) new to Zion NP, discovered by Fertig and Ott

Asclepiadaceae transferred to Apocynaceae following APG III

*Androstephium* transferred from Liliaceae to Asparagaceae following APG III

*Asparagus* transferred from Liliaceae to Asparagaceae following APG III.

- Asplenium* transferred from Polypodiaceae to Aspleniaceae following FNA  
*Aster* (Asteraceae) split into *Herrickia* and *Symphotrichum* following FNA  
*Bidens pilosa* (Asteraceae) new to Zion NP (and a Utah state record) discovered by Fertig and park staff in the South Campground  
*Boerhavia spicata* (Nyctaginaceae) renamed *Boerhavia torreyana* following Intermountain Flora  
*Bromus anomalus* (Poaceae) not in UT according to FNA, specimens referable to *Bromus porteri*  
*Buchloe dactyloides* (Poaceae) new to Zion NP  
*Camissonia brevipes*, *C. multijuga*, *C. parryi*, and *C. walkeri* (Onagraceae) transferred to *Chylismia* following Wagner et al. (2007)  
*Camissonia boothii* var. *villosa* (Onagraceae) transferred to *Eremothera* following Wagner et al. (2007)  
Capparaceae transferred to Cleomaceae following Intermountain Flora and APG III  
*Castilleja* transferred from Scrophulariaceae to Orobanchaceae following APG III  
*Celtis* transferred from Ulmaceae to Cannabaceae following APG III  
*Cheilanthes* transferred from Polypodiaceae to Pteridaceae following FNA  
Chenopodiaceae (except for *Sarcobatus*) transferred to Amaranthaceae following APG III  
*Chrysopsis* (Asteraceae) transferred to *Heterotheca* following FNA  
*Chrysothamnus nauseosus* and *C. parryi* (Asteraceae) transferred to *Ericameria* following FNA  
*Claytonia* transferred from Portulacaceae to Montiaceae following APG III  
*Collinsia* transferred from Scrophulariaceae to Plantaginaceae following APG III  
*Cordylanthus* transferred from Scrophulariaceae to Orobanchaceae following APG III  
*Cordylanthus wrightii* (Orobanchaceae) new to Zion NP  
*Coryphantha vivipara* var. *arizonica* (Cactaceae) renamed *C. vivipara* var. *vivipara* following Intermountain Flora  
Cuscutaceae transferred to Convolvulaceae following APG III  
*Cystopteris* transferred from Polypodiaceae to Dryopteridaceae following FNA  
*Cystopteris fragilis* (Dryopteridaceae) no longer recognized in Zion NP flora and split into two species: *C. reevesiana* and *C. tenuis*.  
*Cystopteris utahensis* (Dryopteridaceae) new to Zion NP  
*Delphinium andersonii* var. *scaposum* (Ranunculaceae) renamed *Delphinium scaposum* following Intermountain Flora  
*Dichelostemma* transferred from Liliaceae to Asparagaceae following APG III  
*Dipsacus sylvestris* (Dipsacaceae) new to Zion NP  
*Disporum* (Liliaceae) transferred to *Prosartes* following FNA  
*Dithyrea* (Brassicaceae) transferred to *Dimorphocarpa* following FNA  
*Draba asprella* var. *zionensis* (Brassicaceae) renamed *Draba zionensis* following Intermountain Flora  
*Dryopteris* transferred from Polypodiaceae to Dryopteridaceae following FNA  
*Dysphania* (Chenopodiaceae) split from *Chenopodium* following FNA and Intermountain Flora  
*Echinocereus engelmannii* var. *chrysocentrus* (Cactaceae) renamed *E. engelmannii* ssp. *engelmannii* following Intermountain Flora  
*Echinocereus triglochidiatus* var. *melanacanthus* (Cactaceae) renamed *E. coccineus* following Intermountain Flora  
*Echinocereus triglochidiatus* var. *mojavensis* (Cactaceae) renamed *E. mojavensis* following Intermountain Flora  
*Echinochloa muricata* var. *microstachya* (Poaceae) new to Zion NP  
*Ephedra viridis* var. *viscida* (Ephedraceae) new to Zion NP, discovered by Fertig & McConnell  
*Epilobium angustifolium* (Onagraceae) transferred to *Chamerion* following Intermountain Flora  
*Ericameria* (Asteraceae) recognized as a new genus with taxa from *Chrysothamnus* and *Haplopappus*  
*Eriogonum corymbosum* var. *aureum* (Polygonaceae) renamed *E. corymbosum* var. *glutinosum* following Intermountain Flora  
*Eriogonum corymbosum* var. *thompsoniae* & var. *albiflorum* (Polygonaceae) transferred to *E. thompsoniae* following Intermountain Flora  
*Eriogonum inflatum* var. *fusiforme* (Polygonaceae) renamed *E. fusiforme* following Intermountain Flora  
*Eriogonum jamesii* var. *rupicola* (Polygonaceae) renamed *E. arcuatum* var. *rupicola* following Intermountain Flora  
*Eriogonum panguicense* (Polygonaceae) renamed *E. panguicense* var. *panguicense* following Intermountain Flora  
*Eriogonum racemosum* var. *zionis* (Polygonaceae) renamed *E. zionis* following Intermountain Flora  
*Erythranthe cordata* (Phrymaceae) recognized as a segregate taxon from *E. guttata* following Nesom  
*Eupatorium herbaceum* (Asteraceae) transferred to *Ageratina* following FNA  
*Fendlerella* transferred from Saxifragaceae to Hydrangeaceae following Intermountain Flora and APG III  
*Festuca bromoides*, *F. microstachys*, *F. myuros*, & *F. octoflora* (Poaceae) transferred to *Vulpia* following FNA & Intermountain Flora  
*Filago californica* (Asteraceae) transferred to *Logfia* following FNA  
*Fraxinus pensylvanica* (Oleaceae) new to Zion NP  
Fumariaceae transferred to Papaveraceae following APG III

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*Gaura* (Onagraceae) transferred to *Oenothera* following Wagner et al. (2007, 2013)  
*Gnaphalium canescens* (Asteraceae) transferred to *Pseudognaphalium* following FNA  
*Habenaria* (Orchidaceae) transferred to *Platanthera* following FNA  
*Haplopappus armerioides* (Asteraceae) transferred to *Stenotus armerioides* following FNA  
*Haplopappus gracilis* and *H. spinulosus* var. *gooddingii* (Asteraceae) transferred to *Xanthisma* following FNA  
*Haplopappus leverichii* (Asteraceae) transferred to *Isocoma humilis* following FNA  
*Haplopappus linearifolius* var. *interior* and *H. zionis* (Asteraceae) transferred to *Ericameria* following FNA  
*Haplopappus scopulorum* (Asteraceae) transferred to *Chrysothamnus* following FNA  
*Hedera helix* (Araliaceae) new to Zion NP, discovered by Dan McConnell in housing area  
Hydrophyllaceae transferred to Boraginaceae following APG III  
*Hymenoxys acaulis* (Asteraceae) transferred to *Tetraneuris* following FNA  
*Jamesia* transferred from Saxifragaceae to Hydrangeaceae following Intermountain Flora and APG III  
*Lactuca tatarica* (Asteraceae) transferred to *Mulgedium* following FNA  
Lemnaceae transferred to Araceae following APG III  
*Leptodactylon* (Polemoniaceae) transferred to *Linanthus* following Porter & Johnson  
*Leucocrinum* transferred from Liliaceae to Asparagaceae following APG III.  
*Lewisia* transferred from Portulacaceae to Montiaceae following Intermountain Flora & APG III  
*Linanthastrum nuttallii* (Polemoniaceae) transferred to *Leptosiphon* following Porter & Johnson  
*Linaria* transferred from Scrophulariaceae to Plantaginaceae following APG III  
*Lotus tenuis* (Fabaceae) new to Zion NP, discovered by Fertig & NPS resource management staff  
*Lychnis* transferred to *Silene* following FNA  
*Malacothrix clevelandii* var. *stebbinsii* (Asteraceae) renamed *M. stebbinsii* following FNA  
*Medicago minima* (Fabaceae) new to Zion NP discovered by Dan McConnell  
*Mimetanthe* (Scrophulariaceae) transferred to Phrymaceae following APG III  
*Mimulus cardinalis* (Scrophulariaceae) transferred to *Erythranthe verbenacea* (Phrymaceae) following Nesom  
*Mimulus glabratus* (Scrophulariaceae) changed to *Erythranthe utahensis* (Phrymaceae) following Nesom  
*Mimulus parryi* (Scrophulariaceae) transferred to *Diplacus parryi* (Phrymaceae) following Nesom  
*Mimulus rubellus* (Scrophulariaceae) transferred to *Erythranthe rubella* (Phrymaceae) following Nesom  
*Mimulus suksdorfii* (Scrophulariaceae) transferred to *Erythranthe suksdorfii* (Phrymaceae) following Nesom  
*Mirabilis pumila* (Nyctaginaceae) renamed *Mirabilis comata* following Intermountain Flora  
Monotropaceae transferred to Ericaceae following APG III  
*Montia* transferred from Portulacaceae to Montiaceae following Intermountain Flora & APG III  
*Muscari botryoides* (Asparagaceae) new to Zion NP, discovered by Derrick Zobell  
*Opuntia acanthocarpa*, *O. echinocarpa*, & *O. whipplei* (Cactaceae) transferred to *Cylindropuntia* following Intermountain Flora and FNA.  
*Opuntia erinacea* var. *aurea* (Cactaceae) renamed *O. aurea* following Intermountain Flora & FNA  
*Opuntia erinacea* var. *erinacea* (Cactaceae) renamed *O. polyacantha* var. *erinacea* following Intermountain Flora  
*Opuntia erinacea* var. *ursina* and var. *utahensis* (Cactaceae) no longer recognized following Intermountain Flora  
*Opuntia phaeacantha* var. *discata* (Cactaceae) renamed *O. engelmannii* var. *engelmannii* following Intermountain Flora  
*Orthocarpus* transferred from Scrophulariaceae to Orobanchaceae following APG III  
*Oryzopsis micrantha* (Poaceae) transferred to *Piptatherium* following FNA  
*Parnassia* transferred from Saxifragaceae to Celastraceae following APG III  
*Parthenocissus quinquefolia* (Vitaceae) new to Zion NP, discovered by Dan McConnell  
*Pedicularis* transferred from Scrophulariaceae to Orobanchaceae following APG III  
*Pellaea* transferred from Polypodiaceae to Pteridaceae following FNA  
*Penstemon* transferred from Scrophulariaceae to Plantaginaceae following APG III  
*Philadelphus* transferred from Saxifragaceae to Hydrangeaceae following Intermountain Flora and APG III  
*Pityrogramma* transferred from Polypodiaceae to Pteridaceae following FNA  
*Polygonum convolvulus* (Polygonaceae) transferred to *Fallopia* following Intermountain Flora  
*Polygonum douglasii* var. *johnstonii* (Polygonaceae) renamed *Polygonum sawatchense* following Intermountain Flora  
*Polygonum douglasii* var. *utahense* (Polygonaceae) renamed *Polygonum utahense* following Intermountain Flora  
*Polygonum persicaria* (Polygonaceae) transferred to *Persicaria* following Intermountain Flora  
*Polypogon semiverticillatus* (Poaceae) renamed *Polypogon viridis* following FNA  
*Polystichum* transferred from Polypodiaceae to Dryopteridaceae following FNA  
*Potamogeton filiformis* var. *occidentalis* (Potamogetonaceae) transferred to *Stuckenia* following FNA  
*Potentilla arguta* and *P. glandulosa* (Rosaceae) transferred to *Drymocallis* following FNA  
*Pteridium* transferred from Polypodiaceae to Dennstaedtiaceae following FNA  
Pyrolaceae transferred to Ericaceae following APG III

- Ranunculus andersonii* var. *juniperinus* (Ranunculaceae) renamed *Ranunculus andersonii* var. *tenellus* following Intermountain Flora
- Ranunculus testiculatus* (Ranunculaceae) transferred to *Ceratocephala* following Intermountain Flora
- Ribes* transferred from Saxifragaceae to Grossulariaceae following Intermountain Flora & APG III
- Sambucus* transferred from Caprifoliaceae to Adoxaceae following APG III
- Sarcobatus* transferred from Chenopodiaceae to Sarcobataceae, following Intermountain Flora and APG III.
- Scirpus maritimus* (Cyperaceae) transferred to *Bolboschoenus* following FNA
- Scirpus acutus*, *S. pungens*, & *S. validus* (Cyperaceae) transferred to *Schoenoplectus* following FNA
- Senecio multilobatus* and *S. streptanthifolius* (Asteraceae) transferred to *Packera* following FNA
- Smilacina* (Liliaceae) transferred to *Maianthemum* in Asparagaceae following FNA
- Stipa x bloomeri*, *S. hymenoides*, *S. lettermanii*, *S. nelsonii*, and *S. pinetorum* (Poaceae) transferred to *Achnatherum* following FNA
- Stipa comata* and *S. neomexicana* (Poaceae) transferred to *Hesperostipa* following FNA
- Stipa speciosa* (Poaceae) transferred to *Jarava* following FNA
- Talinum parviflorum* renamed *Phemeranthus confertiflorus* and transferred from Portulacaceae to Montiaceae following Intermountain Flora & APG III
- Taraxacum laevigatum* (Asteraceae) new to Zion, discovered in wash near east tunnel by W. Fertig
- Thlaspi* (Brassicaceae) transferred to *Noccaea*
- Valerianaceae transferred to Caprifoliaceae following APG III
- Veronica* transferred from Scrophulariaceae to Plantaginaceae following APG III
- Viguiera* (Asteraceae) transferred to *Heliomeris* following FNA
- Viscaceae transferred to Santalaceae following APG III
- Woodsia* transferred from Polypodiaceae to Dryopteridaceae following FNA
- Zannichelliaceae transferred to Potamogetonaceae following APG III
- Zauschneria latifolia* var. *garrettii* (Onagraceae) renamed *Epilobium canum* var. *garrettii* following Intermountain Flora
- Zigadenus* transferred from Liliaceae to Melanthiaceae following APG III

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This paper is dedicated to the memory of the late Margaret Malm (1928-2014), long-time Zion National Park volunteer naturalist and plant lover, who wrote her own key to the flora of the park and discovered several new species for the area. In the photo on the right, Margaret is weeding *Mollucella laevis* (Shellflower or Bell's of Ireland) near the Chinle Trail to remove them from competing with several rare endemic annuals. Photo by Cheryl Decker.



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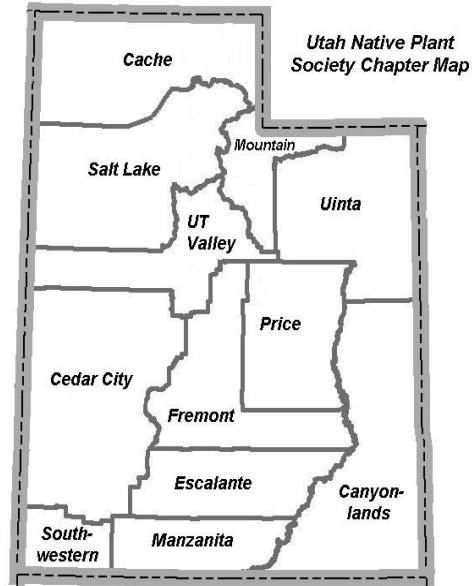
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