

## FLORA OF THE NORTH AND SOUTH SNAKE RANGES

This flora covers the North and South Snake Ranges, extending south to The Troughs, including the valley bottoms on each side. \*Plants deposited in the herbarium at the National Park Headquarters. !Plants deposited at PUA, †Plants deposited at Glenn Clifton Herbarium, ✓Plants deposited at University of Nevada Las Vegas.

Note: This author does not comply with all the rules as set forth by academia. He does what is best for the plants, not what is best for academia. This author also does not buy all the phylogenetic work that is being done, because most of it has no basis in fact. The same goes for DNA work, the markers are most often hard to see, so you can make them say what you want them to say. He doesn't care about the x numbers either. These people are not allowing the plants to testify, morphological speaking to their own existence. This is being done by those who think they are smarter than the plants. (Plants were in existence before the human race). Numerous annual plants often don't come up in dry years and some of the perennial don't either. This is the case in the desert part of this treatment. One of the most major points that one must understand is that plants are very plastic and are often hard to understand. The second is that those who work with plants often don't agree with each other as to the placement of families, genera, or species. It is essentially irrelevant what family or what genus a plant belongs, they only need a name and so they can be keyed out. **It now has become a muddy mess of scientific stupidity. Plants have not changed.**

### TABULATION OF THE FLORA

	Families	Genera	Taxa
Fern and Fern Allies	6	10	17
Cone Bearing Plants	3	16	13
Flowering Plants-Dicots	73	296	747
Flowering Plants-Monocots	17	76	214
Totals	99	378	991

There are other taxa that this author made into complexes because there is no real way to separate them. There are at least 17 taxa that should be here that are included in the keys. There are at least 32 that don't fit any named taxa, these have a name that is in regular type to show that they are not a published name.

This treatment covers a little over 2% of Nevada's land mass with about 30% of the flora being present.

### KEY TO PLANT FAMILIES OR GROUPS

- 1 Plants reproducing by 1-celled spores borne in sporangia. . . . . (Page 8) **Fern and Fern Allies**
- 1 Plants reproducing from seeds, these released from flowers or cones, cones sometimes flesh covered
- 2 Seeds released from cones, plants not bearing typical flowers. . . . . (Page 11) **Cone-bearing Plants**
- 2 Seeds released from typical flowers, these having calyx; or petals; or styles, one or the other may be missing but not all at once, sometimes bracts take the places of calyx and petals
- 3 Most or all the plant growing in water, sometimes floating, plants that grow in water but best collected after water dries, not included here
- 4 Plants free floating. . . . . **Lemnaceae**
- 4 Plants rooting
- 5 Leaves finely dissected into filiform segments
- 6 Plants lacking obvious petals. . . . . **Haloragaceae**
- 6 Plants bearing obvious petals
- 7 Flowers regular, white. . . . . **Ranunculaceae**
- 7 Flowers irregular, yellow. . . . . **Lentibulariaceae**
- 5 Leaves not as above
- 8 Leaves in uniform whorls. . . . . **Hippuridaceae**
- 8 Leaves not as above

- 9 Leaves linear, parallel-veined; plants mostly under water
  - 10 Inflorescence terminal; leaves alternate. . . . . **Potamogetonaceae**
  - 10 Inflorescence axillary; leaves opposite. . . . . **Zannichelliaceae**
  - 9 Leaves broad, net-veined; plants floating . . . . . (*Persicaria*) **Polygonaceae**
- 3 Most of the plant living above water or on dry land or plants that are best collected after the water dries
  - 11 Plants growing on drying mud late in the season, less than 10 cm tall
    - 12 Plants lacking leaves on the stem. . . . . (*Limosella*) **Scrophulariaceae**
    - 12 Plants with leaves on the stem
      - 13 Leaves narrowly oblong to widely elliptic, bases not fused with each other
        - 14 Calyx lacking appendages. . . . . **Elatinaceae**
        - 14 Calyx with appendages between its lobes. . . . . **Lythraceae**
      - 13 Leaves oblanceolate to linear, bases fused with each other. . . . . (*Crassula*) **Crassulaceae**
  - 11 Plants, if growing on mud in late season usually over 10 cm tall
    - 15 Plants parasitic or saprophytic; leaves scale-like, or lacking. . . . . **Group 1**
    - 15 Plants not obviously parasitic or saprophytic
      - 16 Plants having thorns, spines, barbed bristles, or old branches spinescent (fruits with hooked or straight spines included here) . . . . . **Group 2**
      - 16 Plants lacking any kind of thorns, spines or barbed bristles
        - 17 Plants a climbing vine or having tendrils at the ends of the leaf rachis
          - 18 Plants a climbing vine
            - 19 Leaves with 3-7 leaflets . . . . . (*Clematis*) **Ranunculaceae**
            - 19 Leaves simple, palmately lobed. . . . . **Cannabaceae**
          - 18 Plants having tendrils at the ends of the leaf rachis. . . . . (*Lathyrus, Vicia*) **Fabaceae**
        - 17 Plants not climbing or having tendrils
          - 20 Plants with the stems jointed; leaves scale-like; inflorescence looks like a continuation of the stem . . . . . (*Allenrolfea*) **Chenopodiaceae**
      - 20 Plants in no respects as above
        - 21 Petals narrow, hooded, inserted between petaloid sepals that are early deciduous. . . . . **Rhamnaceae**
        - 21 Petals not as above
          - 22 Plants having milky sap (this can not be seen on pressed specimens, make notes) . . . . . **Group 3**
          - 22 Plants lacking milky sap
            - 23 Herbage with some or all the hairs stellate, branched, free at both ends, or barbed. . . . . **Group 4**
            - 23 Herbage with simple hairs or glabrous
              - 24 Plants with some or all the flowers imperfect (sometime parts of the stamens or parts of the styles present but infertile), sometimes pistillate or staminate flowers each on separate plants (dioecious), sometimes pistillate and staminate flowers on the same plant but separate from each other, or sometimes flowers in heads with the inner ones generally bisexual and the outer pistillate or appearing so. . . . . **Group 5**
        - 24 Plants with all the flowers perfect
          - 25 1st and 2nd whorl of floral parts not evident; pseudoperianth (bracts, scales, or a perianth-like involucre) present or lacking, some of these bracts are called scales (calyx present in some in the form of bristles) or glumes (perianth present in the form of lodicules; these plants have parallel-veined leaves except 1 Dicot family. . . . . **Group 6**
          - 25 1st and or 2nd whorl or both of the floral parts evident
            - 26 Flowers with the corolla and or the calyx irregular; or calyx spurred. . . . . **Group 7**
            - 26 Flowers with the corolla and or the calyx regular, calyx not spurred
              - 27 Plants woody for some distance above its base, never dying back to the ground each year
                - 28 Branchlets with numerous scale-like leaves. . . . . **Tamaricaceae**
                - 28 Branchlets with well developed leaves
                  - 29 Leaves divided, has leaflets. . . . . **Group 8**
                  - 29 Leaves simple, may be deeply lobed, but lobes confluent to leaf rachis. . . . . **Group 9**
              - 27 Plants herbaceous, sometimes ± woody at base; the stems ± dying back to the ground each year
                - 30 Inflorescence umbellate or flowers umbellate in an involucre. . . . . **Group 10**
                - 30 Inflorescence not umbellate
                  - 31 1st and or 2nd whorl or floral parts lacking, sometimes both are present but one or the other are very inconspicuous, or some flowers are included here that soon lose their 1st whorl . . . . . **Group 11**
                  - 31 1st and 2nd whorl of floral parts present, dissimilar or similar

- 32 Petals 3 and calyx 3 and are of the  $\pm$  same color (Monocots) . . . . . **Group 12**
- 32 Petals other than 3 and calyx other than 3 and are different in color (dicots) . . . . . **Group 13**
- 33 Pistils 2-250. . . . . **Group 13**
- 33 Pistils 1
  - 34 Petals fused for some distance. . . . . **Group 16**
  - 34 Petals  $\pm$  separate
    - 35 Stamens more than twice as many as the petals. . . . . **Group 14**
    - 35 Stamens twice as many or fewer than the petals. . . . . **Group 15**

**Group 1 Plants parasitic or saprophytic; leaves scale-like, or lacking**

- 1 Plants attached to trees, shrubs or herbs
  - 2 Plants attached to trees. . . . . **Viscaceae**
  - 2 Plants crawling over herbaceous plants. . . . . **Cuscutaceae**
- 1 Plants attached to soil; saprophytic
  - 3 Corolla irregular
    - 4 Lobes of corolla similar in shape and size. . . . . **Orobanchaceae**
    - 4 Lobes of corolla not the same in shape or size. . . . . **Orchidaceae**
  - 3 Corolla regular. . . . . **Monotropaceae**

**Group 2 Plants having thorns, spines, barbed bristles, or old branches spinescent (fruits with hooked or straight spines included here)**

- 1 Plants with all the leaves replaced by spines or barbed bristles. . . . . **Cactaceae**
- 1 Plants with most of the leaves not modified
  - 2 Plants with stems and fruit having thorns. . . . . **Solanaceae**
  - 2 Plants not with both stems and fruit having thorns
    - 3 Fruit with hooked or straight spines
      - 4 Plants mostly erect. . . . . (*Ambrosia, Xanthium*) **Asteraceae**
      - 4 Plants strictly prostrate. . . . . **Zygophyllaceae**
    - 3 Fruit lacking spines
      - 5 Leaves spinose
        - 6 Leaves with spines at their tip only
          - 7 Leaves deeply striate, rather thick and rigid, margins in age filiferous, fibers  $\pm$  coarse and curly. . . . . **Agavaceae**
          - 7 Leaves not with the above combinations
            - 8 Flowers irregular. . . . . (*Astragalus*) **Fabaceae**
            - 8 Flowers regular. . . . . (*Leptodactylon, Phlox*) **Polemoniaceae**
        - 6 Leaves with spines on margins
          - 9 Shrubs. . . . . **Berberidaceae**
          - 9 Herbs
            - 10 Flowers numerous, surrounded by bracts (heads). . . . . **Asteraceae**
            - 10 Flowers single. . . . . **Papaveraceae**
    - 5 Leaves not spinose
      - 11 Plants with spine-tipped bracts in the inflorescence
        - 12 Plants  $\pm$  prostrate. . . . . **Amaranthaceae**
        - 12 Plants mostly erect. . . . . (*Salsola*) **Chenopodiaceae**
      - 11 Plants lacking spine-tipped bracts
        - 13 Stems having epidermal prickles
          - 14 Calyx green; petals large, leaves pinnate. . . . . (*Rosa, Rubus*) **Rosaceae**
          - 14 Calyx whitish; petals small, not obvious; leaves simple. . . . . **Grossulariaceae**
        - 13 Stems lacking epidermal prickles
          - 15 Plants with the old branches spinescent
            - 16 Leaves arising from the stem
              - 17 Flowers enclosed in two bracts. . . . . (*Atriplex, Grayia*) **Chenopodiaceae**
              - 17 Flowers in a catkin-like spiral, many male above with several female below. . . . . (*Sarcobatus*) **Chenopodiaceae**
            - 16 Leaves arising from between stipular lobes. . . . . **Crossosomataceae**
          - 15 Plants with stipular or spines replacing some of the leaves
            - 17 Leaves silvery on the lower surface. . . . . (*Elaeagnus*) **Elaeagnaceae**

- 17 Leaves not silvery on the lower surface
  - 18 Plant a fairly large shrub; calyx reduced to pappus; flowers yellow. . . . . (*Tetradymia*) **Asteraceae**
  - 18 Plants a small subshrub; calyx not reduced; flowers reddish. . . . . **Polygalaceae**

**Group 3 Plants having milky sap**

- 1 Flowers having all strap-shaped corollas inserted on a common receptacle. . . . . **Asteraceae**
- 1 Flowers not as above
  - 2 Leaves well over 20 mm long; plants coarse
    - 3 Sepals and corolla lobes erect . . . . . **Apocynaceae**
    - 3 Sepals and corolla lobes reflexed. . . . . **Asclepiadaceae**
  - 2 Leaves less than 20 mm long; plants more fine, sometimes prostrate. . . . . **Euphorbiaceae**

**Group 4 Herbage with some or all the hairs, peltate-scalelike, stellate, branched, free at both ends, or barbed**

- 1 Hairs free at both ends (dolabriform). . . . . (*Astragalus*) **Fabaceae**
- 1 Hairs otherwise
  - 2 Hairs barbed. . . . . **Loasaceae**
  - 2 Hairs otherwise
    - 3 Herbs
      - 4 Petals 4. . . . . **Brassicaceae**
      - 4 Petals 5. . . . . **Malvaceae**
    - 3 Shrubs or small trees
      - 5 Hairs peltate-scalelike. . . . . **Elaeagnaceae**
      - 5 Hairs stellate or branched
        - 9 Petals lacking (staminate plants only); desert scrub. . . . . (*Krascheninnikovia*) **Chenopodiaceae**
        - 9 Petals present; montane. . . . . (*Physocarpus*) **Rosaceae**

**Group 5 Plants with some or all the flowers imperfect (sometimes parts of the stamens or parts of the styles present but infertile), sometimes pistillate or staminate flowers each on separate plants (dioecious), sometimes pistillate and staminate flowers on the same plant but separate from each other, or sometimes flowers in heads with the inner ones generally bisexual and the outer pistillate or appearing so**

- 1 Plants fleshy; flowers dark red to purple; pistils mostly 5. . . . . **Crassulaceae**
- 1 Plants not composed of all the characters as above
  - 2 Pistillate and staminate flowers found on the same plant, bisexual often also present
    - 3 Inflorescence composed of 1000+ flowers. . . . . **Typhaceae**
    - 3 Inflorescence composed of way fewer flowers than a 1000
      - 4 Leaves parallel-veined; pistillate flowers enclosed in a sack-like bract (Perigynium). . . . . **Cyperaceae**
      - 4 Leaves net-veined or sometimes veins may be obscure; pistillate flowers not as above
        - 5 Petals present; bisexual flowers present
          - 6 Corolla tubular, anthers normally fused. . . . . **Asteraceae**
          - 6 Corolla not tubular, anthers not fused
            - 7 Inflorescence umbellate; plants herbs. . . . . **Apiaceae**
            - 7 Inflorescence racemose; plants trees. . . . . **Aceraceae**
        - 5 Petals lacking; bisexual flowers usually lacking, present in one
          - 8 Plants shrubs or trees
            - 9 Leaves serrate; plants close to water. . . . . **Betulaceae**
            - 9 Leaves entire; plants of dry sandy places inflated. . . . . (*Atriplex*) **Chenopodiaceae**
          - 8 Plants herbaceous
            - 10 Plants lacking stinging hairs
              - 11 Plants ± prostrate; leaves spatulate. . . . . **Amaranthaceae**
              - 11 Plants ± erect; leaves appearing terete. . . . . (*Halogeton*) **Chenopodiaceae**
            - 10 Plants having sting hairs, erect. . . . . **Urticaceae**
  - 2 Pistillate and staminate flowers found on separate plants (plants that are functionally dioecious are included here)
    - 12 Flowers functionally dioecious (stamens malformed on pistillate plant and pistils malformed on staminate plant). . . . . **Polygonaceae**

- 12 Flowers dioecious (stamens lacking on pistillate plants and pistils lacking on staminate plants)
- 13 Leaves parallel-veined, grass-like
- 14 Pistillate flowers enclosed in a sack-like bract. . . . . *Carex* **Cyperaceae**
- 14 Pistillate flowers not enclosed in a sack-like bract, subtended by a lemma. . . . . (*Poa*) **Poaceae**
- 13 Leaves net-veined or sometimes veins may be obscure, not grass-like
- 15 Petals present
- 16 Flowers 1 per receptacle, sepals normal or lacking
- 17 Leaves ternate, resinous. . . . . **Anacardiaceae**
- 17 Leaves simple. . . . . **Rubiaceae**
- 16 Flowers with several to many per receptacle; sepals lacking or reduced to awn-like bristles. . . . . **Asteraceae**
- 15 Petals lacking
- 18 Plants woody
- 19 Leaves palmately-veined. . . . . **Aceraceae**
- 19 Leaves pinnately-veined. . . . . **Salicaceae**
- 18 Plants herbaceous
- 20 Plants lacking stinging hairs . . . . . **Ranunculaceae**
- 20 Plants having stinging hairs. . . . . **Urticaceae**

**Group 6 Calyx and petals lacking or not recognizable as such; pseudoperianth composed of bracts, glumes and lemmas, scales and perigynia, or pseudoperianth lacking completely**

- 1 Leaves not grass-like . . . . . (*Actaea*) **Ranunculaceae**
- 1 Leaves grass-like
- 2 Fruit an achene; the nodes are not easily found; stems usually having pith; anthers base-fixed. . . . . **Cyperaceae**
- 2 Fruit a caryopsis; the nodes are usually easily found; stem mostly round and hollow; anther versatile. . . . . **Poaceae**

**Group 7 Flower with the corolla and or the calyx irregular; or calyx spurred**

- 1 Flowers composed of a banner, 2 wing petals, and 2 fused petals forming a keel. . . . . **Fabaceae**
- 1 Flowers formed other wise
- 2 Calyx petaloid (at least lateral lobes in one)
- 3 Petals spurred. . . . . **Helleboraceae**
- 3 Petals not spurred
- 4 Calyx with the lateral segments petal-like forming what looks like wings as in the above family; the wing petals lacking. . . . . **Polygalaceae**
- 4 Calyx spurred, or upper sepal forming a hood in which the 2 petals are hide. . . . . **Helleboraceae**
- 2 Calyx generally green, not petaloid
- 5 Perianth segments 6; leaves with parallel veins. . . . . **Orchidaceae**
- 5 Perianth segments 4 or 5; leaves net-veined
- 6 Filaments and anthers in tubes; plants of vernal moist depressions . . . . . **Campanulaceae**
- 6 Filaments, anthers, and plants not as above
- 7 Petals free to their base. . . . . **Violaceae**
- 7 Petals fused for some distance above their base
- 8 Stamens 6; calyx drooping as flowers open, thus appearing to be lacking. . . . . **Fumariaceae**
- 8 Stamens 2 or 4; calyx persistent
- 9 Filaments of the stamens hardly developed, usually shorter than the anthers. . . . . **Verbenaceae**
- 9 Filaments of the stamens well developed, usually longer than the anthers
- 10 Style arising from among the 4-lobed ovary; fruit nutlets. . . . . **Lamiaceae**
- 10 Style arising from the apex of the ovary; fruit a capsule
- 11 Upper lip hood-, beak-, or trunk-like. . . . . **Rhinanthaceae**
- 11 Upper lip not as above. . . . . **Scrophulariaceae**

**Group 8 Plants woody for some distance above their base; leaves divided, has distinct leaflets**

- 1 Leaves 3-foliolate
- 2 Stems densely puberulent. . . . . **Anacardiaceae**
- 2 Stems ± glabrous. . . . . **Aceraceae**

- 1 Leaves with more than 3 leaflets
  - 3 Leaves bipinnate..... (*Chamaebatiaria*) **Rosaceae**
  - 3 Leaves 1-pinnate
    - 4 Leaflets serrate..... (*Sambucus*) **Caprifoliaceae**
    - 4 Leaflets entire
      - 5 Herbage glaucous; petals separate to base; plants of lower elevations..... (*Stanleya*) **Brassicaceae**
      - 5 Herbage not glaucous; petals fused with the calyx; plants of upper elevations. .... (*Pentaphylloides*) **Rosaceae**

**Group 9 Plants woody for some distance above their base; leaves simple, may be deeply lobed, but lobe margins confluent to leaf rachis**

- 1 Leaves with some lobes
  - 2 Plants with flowering heads that have multiple flowers per receptacle. .... **Asteraceae**
  - 2 Plants not as above
    - 3 Leaves palmately veined
      - 4 Leaves opposite. .... **Aceraceae**
      - 4 Leaves alternate or leaf clusters alternate..... **Grossulariaceae**
    - 3 Leaves pinnately veined..... (*Purshia*) **Rosaceae**
- 1 Leaves lacking lobes
  - 4 Young branches having crystalline glands..... **Betulaceae**
  - 4 Young branches lacking crystalline glands
    - 5 Leaves opposite
      - 6 Leaves 5-10 cm long. .... **Cornaceae**
      - 6 Leaves 1-3 cm long
        - 7 Flowers usually single, terminal; corolla 4-lobed; hairs on branches of year often facing down the stem  
..... **Philadelphaceae**
        - 7 Flowers axillary in the upper leaves; corolla 5-lobed; hairs present , not reflexed or lacking on branches  
of year. .... **Caprifoliaceae**
    - 5 Leaves alternate or clusters alternate
      - 8 Leaves serrate (at least at the tip of the leaf)
        - 9 Plants usually well developed trees with a single trunk, bark finely fissured. .... **Ulmaceae**
        - 9 Plants more shrubby, usually lacking a single well developed trunk, bark other wide mens normally more  
than twice as many as the petals. .... **Rosaceae**
      - 8 Leaves entire
        - 10 Leaves with margins slightly to strongly revolute. .... (*Cercocarpus*) **Rosaceae**
        - 10 Leaves with margins not revolute
          - 11 Flowers with 1st whorl of floral parts only
            - 12 Flowers borne in involucre. .... (*Eriogonum*) **Polygonaceae**
            - 12 Flowers not borne in an involucre; whorl of floral part attached to an hypanthium. .... **Comandraceae**
          - 11 Flowers with 1st and 2nd whorl of floral parts present
            - 13 Plants mat forming; petals arising from an hypanthium. .... (*Petrophyton*) **Rosaceae**
            - 13 Plants large shrubs; petals fused forming an urn-shaped corolla..... **Ericaceae**

**Group 10 Inflorescence umbellate or flowers umbellate in an involucre**

- 1 Leaves parallel-veined; leaves grass-like
  - 2 2nd whorl of perianth segments 30-40 mm long. .... **Liliaceae**
  - 2 2nd whorl of perianth segments 6-13 mm
    - 3 2nd whorl of perianth pink to red ..... **Alliaceae**
    - 3 2nd whorl of perianth blue
- 1 Leaves net-veined
  - 2 Involucral lobes partly fused
    - 3 Stamens not exerted; perianth less than 5 mm long; yellow, white or reddish..... (*Eriogonum*) **Polygonaceae**
    - 3 Stamens exerted; perianth about 10 mm long; pink to purple. .... (*Mirabilis*) **Nyctaginaceae**
  - 2 Involucral lobes separate or lacking
    - 4 Flowers lacking sepals and or petals
      - 5 Plants not glandular; flowers not long tubular..... **Apiaceae**
      - 5 Plants glandular; flowers long tubular..... **Nyctaginaceae**

- 4 Flowers with both sepals and petals
  - 6 Leaves divided..... **Apiaceae**
  - 6 Leaves simple..... **Primulaceae**

**Group 11 Plants herbaceous; 1st and or 2nd whorl of floral parts present**

- 1 Ovary superior, sometimes surrounded by the calyx, but always free from it
- 2 Stems generally having a stipular sheath, leaves either attached to it or free from it..... **Polygonaceae**
- 2 Stems lacking stipular sheath, they may have stipules but these not sheathing
  - 3 Leaves divided
    - 4 Inflorescence a compact head. .... (*Sanguisorba*) **Rosaceae**
    - 4 Inflorescence open. .... **Ranunculaceae**
  - 3 Leaves simple, entire or variously toothed
    - 5 Leaves connate (forming a sheath-like structure connecting the opposite leaves)... (*Sagina, Stellaria*) **Caryophyllaceae**
    - 5 Leaves not connate
      - 6 Leaves essentially glabrous
        - 7 Sepals pinkish; flowers in the axils of floral leaves, that have 2 long and the others short..... **Amaranthaceae**
        - 7 Sepals greenish; flowers not as above. .... **Caryophyllaceae**
      - 6 Leaves mealy or hairy, or if glabrous, then with a hair-like mucro at apex..... **Chenopodiaceae**
- 1 Ovary more or less inferior, partly or wholly adnate to the floral tube; stamens attached to floral tube
  - 8 Plants with leaves simple
    - 9 Perianth segments with a tuft of hair; leaves single per node..... **Santalaceae**
    - 9 Perianth segments lacking a tuft of hair; leaves whorled..... **Rubiaceae**
  - 8 Plants with at least upper leaves pinnate. .... **Valerianaceae**

**Group 12 Plants herbaceous; 1st and 2nd whorl of floral parts in 3's; leaves parallel veined (Monocots)**

- 1 Ovary inferior; 1st whorl of floral parts 4.5-6 cm long. .... **Iridaceae**
- 1 Ovary superior; 1st whorl of floral parts 2 cm or less long
  - 2 Perianth brownish or fairly dark
    - 3 Flowers subtended by bracts. .... **Juncaceae**
    - 3 Flowers not subtended by bracts. .... **Juncaginaceae**
  - 2 Perianth white, cream, or mottled
    - 4 Styles 3 ..... **Melanthiaceae**
    - 4 Styles 1, slight to fairly deeply 3-lobed
      - 4 Leaves widely spreading; plants from rhizomes; fruit a berry. .... **Convallariaceae**
      - 5 Leaves fairly erect; plants from bulbs or a bulb-like structure; fruit a capsule. .... **Liliaceae**

**Group 13 Plants herbaceous; pistils 2-250**

- 1 Leaves entire
  - 2 Leaves fleshy. .... **Crassulaceae**
  - 2 Leaves not fleshy
    - 3 Flowers yellow..... **Ranunculaceae**
    - 3 Flowers white..... **Rosaceae**
- 1 Leaves or leaflets variously lobed, serrate, or dentate
  - 4 Petals with a gland close to their base. .... **Ranunculaceae**
  - 4 Petals lacking a gland
    - 5 Leaves simple..... **Saxifragaceae**
    - 5 Leaves divided. .... **Rosaceae**

**Group 14 Plants herbaceous; pistils 1; petals separate; stamens over twice as many as the petals**

- 1 Stamens attached below or free from the pistil
  - 2 Leaves flat not succulent
    - 3 Leaves alternate. .... **Ranunculaceae**
    - 3 Leaves opposite. .... **Hypericaceae**
  - 2 Leaves almost terete, succulent. .... **Portulacaceae**

1 Stamens attached to the floral tube. . . . . **Rosaceae**

**Group 15 Plants herbaceous; pistils 1; petals separate; stamens not more than twice as many as petals**

- 1 Flowers with 5 stamens alternating with 5 fimbriate staminodia. . . . . **Parnassiaceae**  
 1 Flowers not as above  
 2 Ovary completely inferior. . . . . **Onagraceae**  
 2 Ovary superior at least 9/10 free or partly inferior  
 3 Ovary at least 1/4 inferior. . . . . **Saxifragaceae**  
 3 Ovary superior to 1/10 inferior  
 4 Styles 2-5, separated to near base  
 5 Sepals 2; plants mostly fleshy. . . . . **Portulacaceae**  
 5 Sepals 3-several; plants not fleshy  
 6 Petals blue. . . . . **Linaceae**  
 6 Petals white  
 7 Leaf blades reniform, mostly 2-6 cm wide. . . . . **Saxifragaceae**  
 7 Leaf blades not reniform, and they are narrower. . . . . **Caryophyllaceae**  
 4 Style 1, sometimes more or less divided toward apex  
 8 Sepals 4  
 9 Leaves simple or pinnate, never having 3 leaflets; plants not stinking. . . . . **Brassicaceae**  
 9 Leaves having 3 leaflets; plants stinking. . . . . **Capparaceae**  
 8 Sepals mostly 5; filaments 5,8 or 10, often united at base  
 10 Leaves divided. . . . . **Geraniaceae**  
 10 Leaves simple. . . . . **Pyrolaceae**

**Group 16 Plants herbaceous; pistils 1; petals fused for some distance above their base**

- 1 Ovary superior  
 2 Leaves basal, stems leafless  
 3 Inflorescence a congested spike; leaves normally shorter than the inflorescence. . . . . **Plantaginaceae**  
 3 Inflorescence single flowered; leaves exceeding the inflorescence. . . . . (*Limosella*) **Scrophulariaceae**  
 2 Leaves basal as well as cauline  
 4 Corolla with lacerate plaits in between the lobes, ring of hairs at the top of the throat, or with a tuft of hair at the base of the petals with a gland just above. . . . . **Gentianaceae**  
 4 Corolla lacking the hairs and glands  
 5 Stamens long exerted. . . . . **Hydrophyllaceae**  
 5 Stamens not or only slightly exerted  
 6 Flowers axillary  
 7 Flowers sessile or very shortly pedicellate; leaves exceeding the flowers. . . . . **Myrsinaceae**  
 7 Flowers on long peduncles; leaves usually shorter than the flowers. . . . . **Convolvulaceae**  
 6 Flowers not axillary  
 8 Calyx lobes free almost to their base . . . . . **Boraginaceae**  
 8 Calyx lobes fused for some distance above their base, if almost free to their base than flowers with 2 stamens or 1 sterile stamen  
 9 Inflorescence a dense flowered spike with many bracts that exceed the flowers at least 3 times; plants strongly decumbent to prostrate. . . . . **Verbenaceae**  
 9 Inflorescence other wise, if a densely flowered spike with bracts these not exceeding the flowers by 2 times, if bracts exceed the flowers by more than 2 times plants not decumbent or prostrate  
 10 Styles entire to 2-cleft  
 11 Flowers with colors other than all white. . . . . **Scrophulariaceae**  
 11 Flowers all white. . . . . **Solanaceae**  
 10 Style 3-cleft . . . . . **Polemoniaceae**  
 1 Ovary inferior or partly so, flowers are slightly irregular. . . . . **Valerianaceae**

**FERNS AND FERN ALLIES**

- 1 Stems hollow and forming a sheath at the nodes. . . . . **Equisetaceae**  
 1 Stems solid and sheath-less at the nodes

- 2 Plants prostrate forming thick mats; leaves thickly covering stem. . . . . **Selaginellaceae**
- 2 Plants erect, not forming thick mats
  - 3 Sporangia attached on the underside of the fronds
    - 4 Sporangia always marginal or sometimes decurrent on the veins. . . . . **Sinopteridaceae**
    - 4 Sporangia single and separate from the margin
      - 5 Sporangia in pairs, each pair forming a V. . . . . **Aspleniaceae**
      - 5 Sporangia otherwise. . . . . **Woodsiaceae**
  - 3 Sporangia on an elevated stalk above the sterile fronds. . . . . **Ophioglossaceae**

### **ASPLENIACEAE** Spleenwort Family

#### **ASPLENIUM**

#### *Asplenium trichomanes-ramosum* L.

GREEN SPLEENWORT. Limited, about 10040 ft.; hidden in rock crevices of limestone. \*†North Fork Big Wash 734 197E 43 10 336N Clifton 43273.

### **EQUISETACEAE** Horsetail Family

#### **EQUISETUM**

- 1 Sterile stems green, having branches; fertile stems dirty white, lacking branches, withering early. . . . . ***E. arvense***
- 1 Stems not of 2 kinds, all green, seldom having branches
  - 2 Sheaths with 2 dark bands, cones apiculate. . . . . ***E. hyemale***
  - 2 Sheaths with dark band at tip, cones obtuse or inconspicuously apiculate. . . . . ***E. laevigatum***

#### *Equisetum arvense* L. (Plate 1)

FIELD or COMMON HORSETAIL. Frequent, below 8,500 ft.; wet or drying places, often associated with riparian. !Baker Creek T13N R69E S29, \*Baker Creek 739 050E 43 18 640N Clifton 48811

#### *Equisetum hyemale* L.

var. *affine* (Engelm.) A. A. Eat. (Plates 2a, b)

SCOURING RUSH. Fairly frequent, below 8,500 ft.; on streambanks and other moist places. \*Snake Creek T12N R70E S18. [ssp. *a.* (Engelm.) Calder & Taylor].

#### *Equisetum laevigatum* R. Braun (Plate 3)

SMOOTH SCOURING RUSH. Frequent, below 9,000 ft.; along streams and in moist riparian. !Lehman Creek T13N R69E S8, Baker Creek T13N R69E S14, †South Fork Lexington Creek 745 648E 43 03 841N Clifton 41027, \*Snake Creek 739 900E 43 11 600N Clifton 41030.

### **OPHIOGLOSSACEAE** Adder's Tongue Family

#### **BOTRYCHIUM** Moonwort

**Note:** *Botrychium* complex that includes *lunaria*, *simplex*, *crenulatum*, *montanum*, *minganense* and etc. are an extremely mixed up group of plants which will never be understood. There is a single population in Glacier National Park that has every conceivable frond shape. Many species could be named from this one population. In California there are some populations of what is called *B. simplex* which have characters for a number of taxa. They have bipinnate, pinnate to a single leaved frond, one of the plants have some fertile sporangia on the margin of the sterile frond, some have the fronds starting at ground level, while others begin well up the stem. There are other populations of this group that seem to be very consistent without much variation, which if they were all this way than a correlatable group of characters could be applied to all populations. A number of keys that have been made don't seem to agree with the photos that are in the same text. The frond segments are not even remotely similar on plants that are call the same thing. The authors who write the keys make them sound like they are the gospel, when in truth they don't even really now themselves the gospel. They try to say they know them by DNA work which is doubtful. Most of it is BS. **In the area of this treatment there are not populations with a number of taxa growing together.**

- 1 Plants lacking a sterile frond, the fertile 2 fronds opposite each other and are identical to each other. . . . . ***B. paradoxum***
- 1 Plants not as above

- 2 Sterile frond triangular pinnate; veins pinnate; . . . . . *B. lanceolatum*  
 2 Sterile frond linear in shape, veins in the segments, if present, radiating  
 3 Petiole of sterile frond long and attached at about ground level. . . . . *B. simplex*  
 3 Petiole of sterile frond short to almost lacking and attached more toward the middle of stem  
 4 Pinnae distant, oblong, wedge-shaped to narrowly fan-shaped, blade gradually expanding. . . . . *B. minganense*  
 4 Pinnae generally fan-shaped  
 5 Plants growing in fairly wet soil; middle pinnae on the sterile frond spreading. . . . . *B. crenulatum*  
 5 Plants of dry places; middle pinnae of the sterile frond ascending. . . . . *B. lunaria*

***Botrychium crenulatum*** W. H. Wagner (Plate 4)

SCALLOPED MOONWORT. Limited, 10240 ft.; wet meadows. Some of the plant that were at this site were so small that some of the characters were not existent. †south of Johnson Lake 734 512E 43 12 065N Clifton 42883.

***Botrychium lanceolatum*** (Gmel.) Ångstr.

var. *lanceolatum*

LANCE-LEAF MOONWORT. Limited, about 10240 ft.; dry upper margin of meadows. These plants don't even look like ones from other places and most likely should be there own taxon, but others have call these plants this taxon. This author went back to this spot and found that it had been completely alter by an avalanche and he couldn't find any plants of this taxon. \*†south of Johnson Lake 734 512E 43 12 065N Clifton 43256.

***Botrychium lunaria*** (L.) Sw.

MOONWORT. This taxon is supposed to be here. 7,000-11,000 ft.; dryer part of meadows.

***Botrychium minganense*** Vict.

MINGAN MOONWORT. Limited, about 10060 ft.; margins of wet meadows. †Baker Creek 734 398E 43 15 445N, \*Highland Ridge 735 264E 43 06 138N Clifton 45269.

***Botrychium paradoxum*** W. H. Wagner

PARADOX MOONWORT. Limited, about 10190 ft.; sandy limestone soil close to a drying drainage. Upper East Branch Decathon Canyon 736 791E 43 05 123N Clifton 54255.

***Botrychium simplex*** E. Hitchc.

LEAST MOONWORT. Infrequent, 7000-11000 ft.; dryer parts of meadows, finely graveled, barren slopes. \*†south of Johnson Lake 734 512E 43 12 065N Clifton 43257.

***Botrychium*** sp. open mesic, rocky slopes, alpine turf, meadows. These plants are often small and very easily overlooked. These apparently don't seem to fit any known species. \*Stella Lake T13N R68E S11, !Baker Lake 733 530E 43 14 991N.

## SELAGINELLACEAE Spikemoss Family

***Selaginella watsonii*** Underwood (Plate 5)

WATSON'S SPIKEMOSS. Frequent, 6,500-11,500 ft.; open, rocky places. \*Stella Lake T13N R68E S11, !Wheeler Peak 731 692E 43 19 692N, †Baker Lake 11 0733 400E 43 15 074N Clifton 40988, Decathon Canyon 738 056E 43 01 078N Clifton 45235, The Table 742 429E 43 52 660N (NAD 83) Clifton 47170.

## SINOPTERIDACEAE Maiden-hair Family (Pteridaceae)

- 1 Fronds with the fertile different form the sterile. . . . . *Cryptogramma*  
 1 Fronds all fertile when mature  
 2 Fronds 3-pinnate, lower surface covered with multicellular, curved, reddish-brown hairs. . . . . *Cheilanthes*  
 2 Fronds pinnate, the lower pinnae often lobed, lower surface glabrous. . . . . *Pellaea*

## CHEILANTHES

***Cheilanthes feei*** Moore (Plate 6a, b)

SLENDER LIPFERN. Widely scattered, 6000- 9100 ft.; crevices in rock faces, often on limestone. \*Big Springs Wash T10N R69E S17, \*Snake Creek T12N R69E S13, †Mt. Washington Road 731 378E 43 07 738N Clifton 38456, †North Fork Big Wash 743 641 43 08 024 Clifton 43015, †Marble Wash 748 470E 43 69 720N Clifton 48959

## CRYPTOGRAMMA Rock-Brake

***Cryptogramma acrostichoides*** R. Br.

AMERICAN PARSLEY FERN. Limited, crevices, talus, ledges, above 10800 ft. This extends its range in Nevada. The nearest locality is the Ruby Mountains. \*Baker Lake 732 780E 43 15 200N Clifton 40978.

### PELLAEA

*Pellaea breweri* D. C. Eat.

BREWER'S CLIFF-BRAKE. Infrequent, above 8000 ft.; rocky crevices on limestone. \*Mount Washington T12N R68E S11, \*†Highland Ridge 734 511E 43 06 613N Clifton 38426, Coyote Canyon 738 360E 43 66 570N Clifton 48929.

### WOODSIACEAE Cliff Fern Family

- 1 Indusium linear-like. . . . . *Athyrium*
- 1 Indusium cup-like or plate-like, with radiating segments, these obscured by maturing sori
- 2 Indusium hood-like, attached at base, its free tip arched over the sorus and commonly thrown back as the sorus expands. . . . . *Cystopteris*
- 2 Indusium attached under the sorus, plate-like with radiating, inconspicuous segments. . . . . *Woodsia*

### ATHYRIUM

*Athyrium filix-femina* (L.) Roth

var. *cyclosorum* Rupr. (Plates 7a, b)

CALIFORNIA LADY FERN. Limited, below 8400 ft; moist shaded places along streams. Pine Creek 2490 m Fred Landau 111, Pine Creek 729141E 4319349N Clifton 45673.

### CYSTOPTERIS

*Cystopteris fragilis* (L.) Bernh. (Plate 8)

FRAGILE or BRITTLE FERN. Frequent, 6000-11,000 ft. \*Baker Creek 738 636E 43 17 440N Clifton 41049, \*Snake Creek 741 196E 43 11 300N Clifton 43023, Chalk Spring 738 254E 43 57 820N.

### WOODSIA

- 1 Lower surface of the blade glabrous or slightly glandular hairy. . . . . *W. oregana*
- 1 Lower surface of the blade glandular as well as bearing coarse septate hairs. . . . . *W. scopulina*

*Woodsia oregana* D.C. Eat. (Plate 9)

OREGON WOODSIA. Infrequent, below 9400 ft.; cliffs, rock crevices in the shade. \*Osceole Road 732 496E 43 32 916N Clifton 44007, †Miller Basin Wash 732 290E 43 42 976N Clifton 48991, †\*Between Jeff Davis Peak and Baker Creek 737 288E 43 18 200N (NAD 83) Clifton 49041

*Woodsia scopulina* D. C. Eat.

ROCKY MOUNTAIN CLIFF FERN. Fairly infrequent, 8000-11000 ft.; stable rocky slopes. This fern often grows with *Cystopteris fragilis* and at first glance will look like it. \*Bald Mountain 732 967E 4321 969N.

### CONE-BEARING PLANTS

- 1 Branches having bark, not photo synthetic; leaves needles or scales that completely cover the branchlets
- 2 Leaves needle-like. . . . . **Pinaceae**
- 2 Leaves normally of overlapping scales, or if needle-like, than small shrub climbing around on the ground. . . **Cupressaceae**
- 1 Branches green, photo synthetic; leaves scale-like and at the nodes only. . . . . **Ephedraceae**

### CUPRESSACEAE Cyperus Family

#### JUNIPERUS Juniper

- 1 Leaves needle-like, declining shrubs; berry-like cones axillary. . . . . *J. communis*
- 1 Leaves of old branches scale-like, erect shrubs or trees; berry-like cones terminal
- 2 Scale-like leaves minutely ciliolate-denticulate on the margin (care must be taken to look at the real margin,

- not the smooth rolled-under margin; plants of dry slopes, not in well developed riparian
- 3 Tree with a well developed central trunk, the limbs widely spreading; bark reddish-brown ..... *J. occidentalis*
- 3 Tree or shrub, lacking a well developed trunk, if developed than less than 1.5 m long; limbs more erect; bark gray-brown, weathering ashy-white. .... *J. osteosperma*
- 2 Scale-like leaves with entire margins; plants of riparian, mesic slopes. .... *J. scopulorum*

***Juniperus communis* L.**var. *depressa* Pursh (Plate 11)

DWARF JUNIPER. 7,000-11,000 ft.; slopes in forest, riparian at lower elevations. Wheeler Peak Campground, \*Baker Creek 738 368E 43 17 323N, Pine Creek 728353E 4318860N.

***Juniperus occidentalis* Hook.**var. *australis* (Vasek) A. & N. Holmgren

WESTERN JUNIPER. Limited, about 7900 ft.; on a slope. The lone tree has a d. b. h. of about 26 inches and the first limb is about 9 feet off of the ground. The bark is reddish brown and it has obvious resin glands on the leaves. It is a staminate tree. \*Mount Wheeler Mine 731 071E 43 08 684N.

***Juniperus osteosperma* (Torr.) Little (Plates 10a, b)**

UTAH JUNIPER. Frequent, below 8000 ft.; slopes and flats. The plants in Spring Valley are an interesting ecotype in that they grow in a high water table and saline soil. †Baker Creek 740 269E 43 19 265N Clifton 41056, \*Snake Creek 746 390E 43 10 640N Clifton 48829

***Juniperus scopulorum* Sarg. (Plates 12a, b)**

ROCKY MOUNTAIN JUNIPER. Widely scattered, below 9000 ft.; most often in riparian or close by. Murphy Wash T11N R68E S35, Lehman Creek T13N R69E S8, †Pole Canyon 741 400E 43 19 080N Clifton 41052, Pine Creek 727 793E 43 18 671N, \*Snake Creek 746390E 4310640N Clifton 48828.

**EPHEDRACEAE** Ephedra Family**EPHEDRA**

- 1 Plants gray green, glaucous; branches widely spreading. .... *E. nevadensis*
- 1 Plants green; branches erect, broom-like. .... *E. viridis*

***Ephedra nevadensis* S. Wats. (Plates 13a, b)**

NEVADA EPHEDRA. Fairly frequent, below 6,500 ft.; mostly desert scrub, but also in the lower pinyon-juniper. Baker Creek T13N R69E S14, \*Snake Creek 748 606E 43 11 498N.

***Ephedra viridis* Cov. (Plates 14a, b)**

GREEN EPHEDRA. Fairly frequent, below 7,500 ft.; dry rocky places, from desert to lower pinyon-juniper. Lehman Caves, !Baker Creek Road T13N R69E S15, Chalk Spring 738 254E 43 57 820N, \*Dry Canyon 734 370E 43 61 553N Clifton 48907.

**PINACEAE** Pine Family

- 1 Needles in bundles or if single, easily rolled between fingers. .... *Pinus*
- 1 Needles single, not easily rolled between fingers
- 2 Needles usually very sharp pointed, quite painful when pushed against skin. .... *Picea*
- 2 Needles blunt at apex, not painful when pushed against skin
- 3 Cones erect, cones not found whole on the ground. .... *Abies*
- 3 Cones pendulous, old cones found whole on the ground. .... *Pseudotsuga*

**ABIES** Fir***Abies concolor* (Gordon & Glend.) Lindl. ex Hildebr. (Plate 15)**

ROCK MOUNTAIN WHITE FIR. Frequent, 6500- 9,000 ft. Snake Creek, Lehman Creek T13N R69E S8, !Burnt Mill Canyon T13N R69E S6, \*Baker Creek Campground 738 990E 43 18 470N Clifton 48816.

**PICEA** Spruce***Picea engelmannii* Engelm.**

ENGELMANN SPRUCE. Frequent, 7600-112000 ft. This taxon comes down to low elevations in the lower canyons. Snake Creek T12N R669E S9, !Wheeler Peak Campground T13N R68E S11, Lehman Creek T13N R69E S8.

### PINUS Pine

- 1 Needles in bundles of five
- 2 Cones lacking spines; bundle sheaths early deciduous; some of the needles over 4 cm long. . . . . *P. flexilis*
- 2 Cones armed with spines; bundle sheaths persisting for 2-3 years; needles 4 cm or less long. . . . . *P. longaeva*
- 1 Needles mostly in bundles of 3 or single
- 3 Needles mostly in bundles of 3, 8-10 cm long. . . . . *P. ponderosa*
- 3 Needles single, 2.5-3.5 cm long. . . . . *P. monophylla*

#### *Pinus flexilis* James (Plate 16)

Limber Pine. Frequent, 7000-10000 ft.; slopes, riparian at lower elevations. !Wheeler Peak Campground T13N R68E S11, \*Baker Creek 738 368E 43 17 323N, \*†Head of Timber Creek 737 987E 43 15 359N.

#### *Pinus longaeva* D. Bailey (Plate 17)

WESTERN BRISTLECONE PINE. Frequent, 7600-11000 ft. !Lehman Creek T13N R68E S11, \*†Head of Timber Creek 737 987E 43 15 359N, Snake Creek 741 496E 43 11 300N. [*P. aristata* Engelm., in part].

#### *Pinus monophylla* Torr. & Frém. (Plate 18)

SINGLE-LEAF PINYON. Frequent, below 7500 ft.; slopes, growing with Juniper and sagebrush. \*Baker Creek 738 990E 43 18 470N Clifton 48815.

#### *Pinus ponderosa* C. & P. Laws. (Plate 19)

PONDEROSA PINE, YELLOW PINE. Widely scattered 8000-9500 ft. The only real variety is the 5-needle phase in SE Arizona. !Burnt Mill Canyon T13N R69E S6, Pine Creek 727 793E 43 18 671N. [var. *scopulorum* Engelm].

### PSEUDOTSUGA

#### *Pseudotsuga menziesii* (Mirbel) Franco

var. *glauca* (Beissn.) Franco (Plate 20)

INTERIOR DOUGLAS FIR. Frequent, 6000-10500 ft.; slopes. Lehman Creek T13N R69E S8, \*†Head of Timber Creek 737 987E 43 15 359N.

### FLOWERING PLANTS

#### ACERACEAE Maple Family

**Note:** Some put this into Sapindaceae, but the fruit and flowers are markedly different.

#### ACER

#### *Acer glabrum* Torr.

var. *diffusum* (Greene) Smiley (Plates 21a, b)

GREAT BASIN MOUNTAIN MAPLE. Fairly frequent, 6000-10000 ft.; canyons and slopes. These plants can have simple or three leaflets. Some don't recognize any varieties. Apr-May. !Lehman Creek T13N R69E S8. \*Gray Cliff T13N R69E S22, Coyote Canyon 738360E 4366570N Clifton 48930

#### AMARANTHACEAE Amaranth Family

**Note:** *Nitrophila* has long been a disconcerting feature in Chenopodiaceae

- 1 Sepals pinkish; perennial with rhizomes. . . . . *Nitrophila*
- 1 Sepals greenish; annual. . . . . *Amaranthus*

#### AMARANTHUS

- 1 Inflorescence elongate terminal and axillary compound spikes. . . . . *A. retroflexus*

- 1 Inflorescence not elongate, among the leaves  
 2 Stems ascending to erect; pistillate sepals 3. . . . . *A. albus*  
 2 Stems prostrate to strongly arching; pistillate sepals 4-5. . . . . *A. blitoides*

*Amaranthus albus* L. (Plate 22)

WHITE TUMBLEWEED. Infrequent, below 6000 ft. along roads; introduced from the Neotropics. Jun-Oct. \*Highway 894 T13N R67E S15.

*Amaranthus blitoides* S. Wats. (Plate 23)

PROSTRATE AMARANTH. Infrequent, below 7000 ft.; along road margins and about buildings; Jun-Sep. Baker Creek, \*Highway 894 T13N R67E S15. [*A. graecizans* auct. non L.]

*Amaranthus retroflexus* L.

ROUGH PIGWEED or RED-ROOTED AMARANTH. Infrequent, below 6000 ft.; sandy margins of dry streams; cultivated fields; introduced from the Neotropics. Jun-Sep. \*Highway 894 T13N R67E S23.

### NITROPHILA

*Nitrophila occidentalis* (Nutt.) Moq. (Plates 50a, b)

WESTERN NITROPHILA. Fairly frequent, below 5800 ft.; wet alkaline meadows. May-July. Hamlin Valley T10N R70E S1, The Cedars T12N R67E S3.

### ANACARDIACEAE Sumac or Cashew Family

- 1 Plants freely branching; leaflets generally lobate. . . . . *Rhus*  
 1 Plants with stems simple or sparingly branched; leaflets entire or with a few irregular teeth. . . . . *Toxicodendron*

### RHUS

*Rhus aromatica* Ait.

var. *trilobata* (Nutt.) A. Gray (Plate 24)

SQUAW or SKUNK BUSH. Locally frequent, below 8000 ft.; stream banks and terraces, margins of springs and on mesic slopes. May-Jun. Murphy Wash T10N R68E S2, !Lehman Creek T13N R69E S9, †South Fork Lexington Creek 746 064E 43 04 090N, \*Snake Creek 748 566 43 11 449. [*R. trilobata* Nutt.].

### TOXICODENDRON

*Toxicodendron rydbergii* (Small) Greene (Plate 25)

WESTERN POISON-IVY. Local, 5800-6600 ft.; rocky areas below cliffs, riparian. May-Jun. Hendrys Creek 750 453E 43 45 133N Clifton 47284, known from Big Wash.

### APIACEAE Carrot or Parsley Family

- 1 Plants with stems purple-spotted, hollow, quite leafy; leaflets numerous, these finely toothed; the "hemlock" of classical antiquity. . . . . *Conium*  
 1 Plants not combining the above  
 2 Plants acaulescent, may have a pseudoscape between the ground and the first leaves  
 3 Flowers yellow  
 4 Involucel exceeding the umbel by as much as twice. . . . . *Cymopterus*  
 4 Involucel slight longer to shorter than the umbel or almost lacking  
 5 Inflorescence lacking a pistillate central umbel that is shorter than the radial ones; fruit winged . . . . . *Lomatium*  
 5 Inflorescence with a pistillate central umbel that is shorter than the radial ones; fruit wingless. . . . . *Musineon*  
 3 Flowers white  
 6 Leaves puberulent or hirtellous throughout. . . . . *Lomatium*  
 6 Leaves glabrous. . . . . *Cymopterus*  
 1 Plants caulescent, sometimes shortly so, or with one small leaf at the bottom of the inflorescence  
 7 Leaves simple pinnate. . . . . *Berula*  
 7 Leaves at least divided twice, if appearing simple pinnate, than leaflets narrow  
 8 Lateral nerves of the leaflets directed to the sinus with a branch continuing along the margin to the tooth tip above

- the sinus. . . . . *Cicuta*
- 8 Lateral nerves of the leaflets directed to the teeth or lateral nerves not obvious
- 9 Plants usually with two tubers; leaves very narrow, leaflets dimorphic, end one longer than the side leaflets  
 . . . . . *Perideridia*
- 9 Plants lacking the above combination
- 10 Flowers yellowish
- 11 Leaves 3 to 4 times pinnate; divisions narrow. . . . . *Lomatium*
- 11 Leaves once to thrice ternate or ternate-pinnate; divisions broad. . . . . *Osmorhiza*
- 10 Flowers greenish-white to white, rarely pinkish
- 12 Umbels with fewer than 7 flowers; leaves bi-ternate. . . . . *Osmorhiza*
- 12 Umbels with more than 7 flowers; basal leaves 3-4 times ternate-pinnately dissected, or sub-pinnate to ternate-pinnate
- 13 Basal leaves sub-pinnate to ternate-pinnate; leaflets few and quite coarse. . . . . *Angelica*
- 13 Basal leaves 3-4 times ternate-pinnately dissected; leaflets numerous. . . . . *Ligusticum*

### ANGELICA

*Angelica kingii* (S. Wats.) Coult. & Rose (Plates 27a, b)

KING ANGELICA. Fairly frequent, 6000-9200 ft.; wet meadows moist aspen stands, and streambanks. Jun-Sep. !Lehman Creek T13N R69E S7, \*Snake Creek T12N R69E S9, Lehman Creek 6520 ft. Fred Landau 167, Baker Creek 8400 ft Raymond Jandl, South Fork Big Wash 737 640E 43 05 396N.

### BERULA

*Berula erecta* (Huds.) Cov. (Plate 26)

CUTLEAF WATER PARSNIP. Infrequent, below 6500 ft.; wet places. Jun-Sep. !Willow Patch Spring T15N R68E S36, \*Strawberry Creek T14N R69E S20, The Cedars 723 809E 43 12 600N Clifton 40949.

### CICUTA Water-Hemlock

*Cicuta maculata* L.

var. *angustifolia* Hook. (Plates 28a, b)

SPOTTED WATER HEMLOCK. Frequent, below 8000 ft.; stream margins, in wet meadows and marshes. May-Aug. †Lehman Creek 745 187E 43 21 235 Clifton 43295, \*Baker 749 300E 43 21 700N Clifton 48865.

### CONIUM

*Conium maculatum* L. (Plates 29a, b)

POISON-HEMLOCK. Rare, waste places; small meadows; introduced from Europe. Apr-Jul: Lehman Creek 739 417N 43 22 308N.

### CYMOPTERUS Spring-parsley

- 1 Leaves aromatic; flowers yellow; base of plants densely covered by old leaf bases
- 2 Bractlets long exceeding the umbels; leaves with fairly crowded segments. . . . . *C. hendersonii*
- 2 Bractlets shorter than the umbels; leaves quite open, almost skeleton-like. . . . . *C. petraeus*
- 1 Leaves not aromatic; flowers white or purple; if base of plants as above, than inflorescence appearing capitate
- 3 Rays of the umbel very short to lacking, making the inflorescence appear capitate
- 4 Leaves somewhat fleshy, gray-green or blue-green appearing glaucous; below 8000 ft. . . . . *C. purpurascens*
- 4 Leaves not fleshy, green, not appearing glaucous; above 8800 ft. . . . . *C. nivalis*
- 3 Rays of the umbel evident, inflorescence not appearing capitate
- 5 Plants lacking a conspicuous pseudoscape; leaves ternately divided without a rachis or occasionally simple and ternately cleft. . . . . *C. basalticus*
- 5 Plants with a conspicuous pseudoscape; leaves bipinnate. . . . . *C. longipes*

*Cymopterus basalticus* M.E. Jones

DOLOMITE SPRING-PARSLEY. Limited, below 6,500 ft.; gravelly slopes and flats. North Snake Range ?

*Cymopterus hendersonii* (Coult. & Rose) Cronq. (Plate 30)

HENDERSON'S PARSLEY, MOUNTAIN ROCK-PARSLEY. Fairly frequent, 6500-11000 ft. Jun-Jul. \*Spring Valley T10N R68E S22, !Baker Lake T13N R68E S26, \*above Stella Lake T13N R68E S11. [*Pteryxia h.* (Coul. & Rose) Mathias & Const.].

***Cymopterus longipes*** S. Wats

var. *ibapensis* (M.E. Jones) Cronq. (Plates 31a, b)

IBAPAH SPRING-PARSLEY. Frequent, 5000-10700 ft.; grows in most vegetation types except greasewood shrub and riparian, scree slopes. Late Apr-May. \*Cross Road T13N R70E S5, \*Johns Wash T11N R68E S25, Big Canyon 741 928E 43 51 790 (NAD 83) Clifton 47152. [*C. I. M. E. Jones*].

***Cymopterus nivalis*** S. Wats. (Plates 32a, b, c)

ELKO SPRING-PARSLEY. Frequent, 8800-11800 ft.; dry alpine meadows, rocky slopes and ridges, crevices in limestone, and sometimes in fairly deep soil in open forests. This taxon is very wide spread, if all the various related plants are put together as they have been done in the recent treatment for the Great Basin, than it would not be a plant of special concern. This would include the plants found on serpentine in the Strawberry Mountains in central Oregon, which is indeed debatable. Jul-Aug. \*above Johnson Lake T13N R68E S36, !Pyramid Peak T13N R68E S35, †Highland Ridge 734 548E 43 06 519N, Saddle between Arch Canyon and Big Spring Wash 740 515E 43 20 12N (NAD 83).

***Cymopterus petraeus*** M. E. Jones (Plates 33a, b)

ROCK SPRING-PARSLEY. Limited, about 6540 ft.; crevices of cliff, very rocky slopes. In the most recent works for California this taxon has been made a variety of *C. terebinthinus*, however it is as much different from that taxon as some of the other named taxa are different from each other within this genus. Apr-May. Marble Wash 743 456E 43 70 110N Clifton 48943.

***Cymopterus purpurascens*** (A. Gray) M.E. Jones (Plate 34)

WIDE-WINGED SPRING-PARSLEY. Frequent, below 9100 ft.; openings in mixed desert shrub, pinyon-juniper, rocky slopes in low sagebrush. Mar-Apr. \*Spring Valley T11N R68E S18, †South Fork Marble Wash 737 330E 43 63 626N Clifton 48921, head of Coyote Canyon 734 510E 43 67 075N Clifton 51310.

### LIGUSTICUM Lovage

***Ligusticum porteri*** Coul. & Rose (Plates 35a, b)

PORTER'S LOVAGE. Fairly frequent, 7500-9800 ft.; in riparian, mesic slopes in woodlands. Jul-Aug. \*Baker Creek T13N R69E S22, !Stella Lake 732 342E 43 20 865N, †Snake Creek 739 900E 43 11 600N Clifton 41035.

### LOMATIUM

- 1 Peduncle on mature plants having a swollen, inflated top upon which the rays are attached. . . . . ***L. nudicaule***
- 1 Peduncle lacking a swollen, inflated top
  - 2 Flowers yellow or purple
    - 3 Plants quite large, short caulescent; larger leaves at least 3 dm long. . . . . ***L. dissectum***
    - 3 Plants smaller, acaulescent; larger leaves shorter than 3 dm long
      - 4 Leaves glabrous. . . . . ***L. graveolens***
      - 4 Leaves hairy
        - 5 Herbage densely hirtellous-puberulent; fruit about the same as the herbage. . . . . ***L. foeniculaceum***
        - 5 Herbage scabrous; fruit glabrous. . . . . ***L. scabrum***
    - 2 Flowers white. . . . . ***L. nevadense***

***Lomatium dissectum*** (T. & G.) Mathias & Const.

var. *eatonii* (J. Coul. & Rose) Cronq. (Plates 36a, b)

FERN LEAF LOMATIUM. Infrequent, 7000-8700 ft.; woodlands. May-Jul. \*Lehman Creek 736688E 4321620N Clifton 48972.

***Lomatium foeniculaceum*** (Nutt.) Coul. & Rose

var. *fimbriatum* (W. Theob.) Boivin (Plates 37a, b)

LOMATIUM. Frequent, below 10000 ft.; dry slopes and flats, sometimes in open woodlands. Apr-Jun. \*Tungsten Queen Mine T11N R68E S16, !Wheeler Peak Campground 733 258E 43 21 195N, !Baker Creek 738 648E 43 17 587N, Chalk Spring 738 254E 43 57 820N, †Dry Canyon 734 370E 43 61 553N Clifton 48906.

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

var. *alpinum* (S. Wats.) Dorn & R. L. Hartm. (Plate 38)

SMALL STINKING LOMATIUM. Infrequent, 6,400-11,000 ft.; open rocky places, often on limestone. The variety *alpinum* is an unfortunate name as these plants are seldom found in the alpine. May-Jun. \*branch of Lincoln Canyon T12N R68E S26, \*Spring Valley T10N R68E S22, Snake Creek 743 079E 43 11 439N, †between Murphy Wash and Johns Wash 732 287E 42 87 868N Clifton 43962. [*L. nuttallii* (A. Gray) J. F. Macbr. var. *a.* (S. Wats.) Mathias]

***Lomatium nevadensis*** (S. Wats.) J. Coult. & Rose (Plates 39a, b)

NEVADA LOMATIUM. below 9,200 ft.; open slopes in sagebrush. This taxon has been misunderstood by numerous authors over a long time and still is even now. There are two phases of this taxon where the ultimate leaf lobes are longer and broader and the other where the ultimate leaf lobes are shorter and narrower. Mar-Jun

***Lomatium nudicaule*** (Pursh) J. Coult. & Rose

PESTLE PARSNIP or LOVAGE. Fairly frequent, below 8,000 ft.; in soil that holds moister (clay types), open slopes and flats. Apr-Jul.\*Johns Wash T11N R68E S25.

***Lomatium scabrum*** (Coult. & Rose) Mathias

var. *scabrum* (Plates 40a, b)

ROUGH DESERT PARSELY, CLIFF LOMATIUM. Limited, about 5340 ft.; crevices in limestone. Late May-Jun. †Lake Creek 758 157E 43 10 734N Clifton 43894.

**MUSINEON*****Musineon divaricatum*** (Pursh) T. & G. (Plates 41a, b, c)

ALKALINE PARSLEY. Limited, about 5460 ft.; wet gumbo, saline clay. There seems to be a question in the relationship between this genus and *Aletes*. This author has not look at the species included in the former, but in *M. divaricatum* the central umbel which flowers first is strictly staminate with the later flowering side umbels perfect-flowered (at least in the area of this treatment). There seems to be no mention of this in any literature nor is it depicted in any drawings. This needs to be checked in *M. lineare* as well as in *Aletes*. May. \*The Pots T10N R70E S12.

**OSMORHIZA** Sweet-Cicely

1 Flowers yellowish; fruit glabrous; stems clustered. . . . . ***O. occidentalis***

1 Flowers whitish or pinkish; fruit bristly; stems usually simple. . . . . ***O. depauperata***

***Osmorhiza depauperata*** Phil. (Plates 42a, b)

BLUNT FRUITED SWEET-CICELY. Frequent, below 10500 ft.; forest floor. A similar taxon (*O. chilensis*) is reported for this area by one author, but not by others. It differs from this one in that the apex of the fruit is beaked, and the inflorescence branches are more erect. May-early Jul. Baker Creek T13N R69E S30, †Lehman Creek T13N R68E S12, \*below Johnson Lake T13N R68E S36, †Timber Creek 738 163 43 16 254, Ridge Creek 727 793E 43 18 671N Clifton 45626.

***Osmorhiza occidentalis*** (Nutt.) Torr. (Plates 43a, b)

WESTERN SWEET-CICELY. Fairly frequent, 6700-9000 ft.; riparian, mesic slopes in woodlands. May-Aug. †Baker Creek T13N R69E S29, \*below Johnson Lake T13N R68E S12

**PERIDERIDIA** Yampah, Squawroot***Perideridia bolanderi*** (A. Gray) Nelson & J. F. Macbr.

var. *bolanderi* (Plates 44a, b, c)

BOLANDER'S YAMPAH. Fairly frequent, 7500-9900 ft.; dryer parts of meadows, open forest floors, low sagebrush slopes. May-Aug. \*Wheeler Peak Campground T13N R68E S11, Chalk Spring 738 254E 43 57 820N, †South Fork Baker Creek 738180E 4317100N Clifton 48844.

**APOCYNACEAE** Dogbane Family**APOCYNUM**

1 Corolla lobes generally ± erect; top most inflorescence usually exceeded by the foliage or leafy branches. . . . . ***A. cannabinum***

1 Corolla lobes spreading; top most inflorescence usually exceeding the foliage or leafy branches

2 Leaves commonly drooping; tube of corolla 3 times longer than the calyx. . . . . ***A. androsaemifolium***

2 Leaves spreading, rarely slightly ascending; corolla less than 3 times longer than the calyx. . . . . ***A. floribundum***

***Apocynum androsaemifolium*** L. (Plates 45a, b)

SPREADING DOGBANE. Infrequent, below 7500 ft.; open wooded slopes. Jul-Aug. †Baker Creek 735 430E 43 16 600N Clifton 41012, \*Branch North Fork Big Wash 736 300E 43 08 000N Clifton 44537.

***Apocynum cannabinum*** L. (Plates 46a, b)

COMMON DOGBANE, INDIAN HEMP. Infrequent, below 6500 ft.; meadows, along streams, gravelly slopes. No plants of this

taxon have been seen for sure in this area. Jun-Aug.

*Apocynum floribundum* Greene (Plate 47)

INTERMEDIATE DOGBANE. Infrequent, below 7000 ft.; streambanks, hillsides, brushy washes. This taxon is often the most common and most often with out none of its supposed parents close by. Jun-Aug. Lehman Creek 741 818E 43 21 380N, \*Snake Creek 744 300E 43 10 700N, †Baker Creek 744 030E 43 20 350N Clifton 49050.

## ASCLEPIADACEAE Milkweed Family

### ASCLEPIAS Milkweed

- 1 Leaves less than 2.5 cm wide; hoods 5-6 mm long, not narrowing to a point. . . . . *A. hallii*  
 1 Leaves broader than 2.5 cm; hoods 10-13 mm long, narrowing to a point. . . . . *A. speciosa*

*Asclepias hallii* A. Gray (Plate 48)

HALL'S MILKWEED. 7000-9000 ft.; moist meadows. To be looked for as it is within the range of this treatment. Jun-Aug.

*Asclepias speciosa* Torr. (Plates 49a, b)

SHOWY MILKWEED. Widely scattered, below 8500 ft.; moist places as meadows and seeps, ditch banks. May-Sep. Willow Patch Spring 39° 07' 13.6 114° 17' 22", Baker Creek 39° 59' 52" 114° 11' 23", The Cedars 723 809E 43 12 600N Clifton 40946, \*Lehman Creek, Baker Ranch 750 025E 43 22 005N Clifton 48859.

Plates 1-6b



Plate 1 *Equisetum arvense*



Plate 4 *Botrychium crenulatum*



Plate 2a *Equisetum hyemale* var. *affine*



Plate 3 *Equisetum laevigatum*



Plate 5 *Selaginella watsonii*



Plate 2b



Plate 6a *Cheilanthes feei*



Plate 6b

Plates 7a-11



Plate 7a *Athyrium filix-femina* var. *cyclosorum*



Plate 7b



Plate 10b



Plate 8 *Cystopteris fragilis*



Plate 10a *Juniperus osteosperma*



Plate 9 *Woodsia oregana*



Plate 11 *Juniperus communis* var. *de-*

Plates 12a-18



Plate 12a *Juniperus scopulorum*



Plate 1b



Plate 13b



Plate 13a *Ephedra nevadensis*



Plate 14a *Ephedra viridis*



Plate 14b



Plate 17 *Pinus longaeva*



Plate 15 *Abies concolor*



Plate 16 *Pinus flexilis*



Plate 18 *Pinus monophylla*

Plates 19-24



Plate 19 *Pinus ponderosa*



Plate 20 *Pseudotsuga menziesii*



Plate 21a *Acer glabrum*  
var. *diffusum*



Plate 21b



Plate 22 *Amaranthus albus*



Plate 23 *Amaranthus blitoides*



Plate 24 *Rhus aromatic* var. *trilobata*

Plates 25-29b



Plate 25 *Toxicodendron rydbergii*



Plate 26 *Berula erecta*



Plate 27a *Angelica kingii*



Plate 28a *Cicuta maculate* var. *angustifolia*

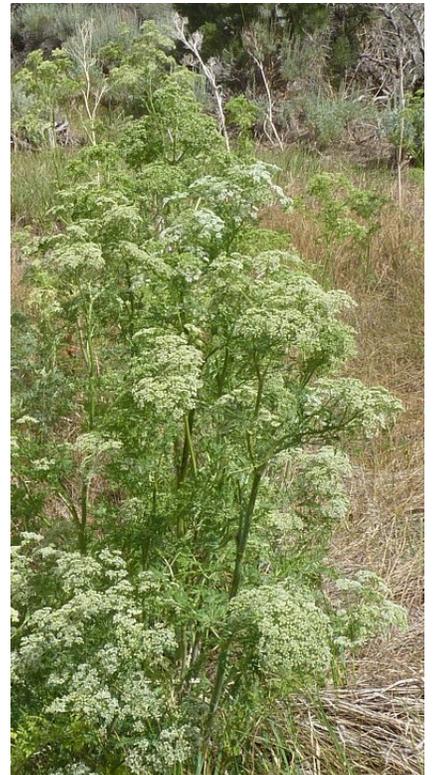


Plate 29a *Conium maculatum*



Plate 27b



Plate 28b



Plate 29b

Plates 30-33b



Plate 30 *Cymopterus hendersonii*



Plate 31a *Cymopterus longipes* var. *ibapensis*



Plate 31b



Plate 32a *Cymopterus nivalis*



Plate 32b



Plate 32c



Plate 33a *Cymopterus petraeus*



Plate 33b

Plates 34-37b



Plate 34 *Cymopterus purpurascens*



Plate 35a *Ligusticum porteri*



Plate 35b



Plate 36b



Plate 36a *Lomatium dissectum* var. *eatonii*



Plate 37a *Lomatium foeniculaceum* var. *fimbriatum*



Plate 37b

Plates 38-42a



Plate 38 *Lomatium graveolens* var. *alpinum*



Plate 39a *Lomatium nevadense*



Plate 40a *Lomatium scabrum*



Plate 39b



Plate 41a *Musineon divaricatum*



Plate 40b



Plate 41b



Plate 41c



Plate 42a *Osmorhiza depauperata*

Plates 42b-46a



Plate 42b



Plate 43a *Osmorhiza occidentalis*



Plate 43b



Plate 44a *Perideridia bolanderi*



Plate 44b



Plate 44c



Plate 45 *Apocynum androsaemifolium*



Plate 45b



Plate 46a *Apocynum cannabinum*

Plates 46b-50b



Plate 46b



Plate 47 *Apocynum floribundum*



Plate 48 *Asclepias hallii*



Plate 49a *Asclepias speciosa*



Plate 49b



Plate 50a *Nitrophila occidentalis*



Plate 50b

## ASTERACEAE Sunflower Family

**Note:** Some wholesale changes have taken place in this family. They may be justifiable. This author buys some of them, others only make the keys laborious and don't help the understanding of the plants at all. The word that is now used in place of achene is cypsela. This new word will not be used in this treatment.

- 1 Receptacle with stiff setae, chaffy scales or naked
- 2 Plants lacking spinulose leaf margins, spines on the end of old branches, prickles on the stem, leaf axils or on the fruit
- 3 Heads with all strap-shaped corollas; juice milky. . . . . **Group 1**
- 3 Heads with strap-shaped corollas marginal or lacking; juice clear
- 4 Heads with strap-shaped corollas apparent
- 5 Strap-shaped corollas yellow
- 6 Pappus of capillary bristles, these scabrous or plumose. . . . . **Group 2**
- 6 Pappus of scales (these sometimes deeply cleft into several bristles), of firm awns, or lacking. . . . . **Group 3**
- 5 Strap-shaped corollas lacking yellow. . . . . **Group 4**
- 4 Heads lacking apparent strap-shaped corollas
- 7 Pappus of ± capillary bristles. . . . . **Group 5**
- 7 Pappus not of capillary bristles. . . . . **Group 6**
- 2 Plants having leaf margins spinulose, spines on the end of branches, in leaf axils, prickles on the stem or on the fruit . . . . . **Group 7**
- 1 Receptacle with numerous bristles (Thistles). . . . . **Group 8**

### Group 1 Heads with all strap-shaped corollas; juice milky

- 1 Strap-shaped corollas blue. . . . . *Mulgedium*
- 1 Strap-shaped corollas other than blue
- 2 Cauline leaves auriculate-clasping. . . . . *Lactuca*
- 2 Cauline leaves not auriculate-clasping
- 3 Leaves with ± prominent crustose white margin; plants up to 6 cm tall. . . . . *Glyptopleura*
- 3 Leaves with plain margins; plants normally taller than 6 cm
- 4 Pappus of plumose bristles
- 5 Pappus composed of scales with a terminal plumose bristle; young heads drooping. . . . . *Microseris*
- 5 Pappus composed of plumose bristles only
- 6 Inflorescence with numerous branches; flowers small, white. . . . . *Stephanomeria*
- 6 Inflorescence simple; flowers large, yellow. . . . . *Tragopogon*
- 4 Pappus of capillary bristles
- 7 Inflorescence branching
- 8 The rays very small. . . . . *Prenanthea*
- 8 The rays quit prominent
- 9 Rays yellow
- 10 Plants perennial with a deep seated root. . . . . *Crepis*
- 10 Plants annual with a shallow root. . . . . *Malacothrix*
- 9 Rays pinkish. . . . . *Lygodesmia*
- 7 Inflorescence not branching, composed of a single head on top of a leafless peduncle
- 11 Achenes with at least the top half muricate or tuberculate; beak long and ± thread-like. . . . . *Taraxacum*
- 11 Achenes glabrous; beak shorter and not as thread-like. . . . . *Agoseris*

### Group 2 Heads with strap-shaped corollas marginal and yellow; juice clear; pappus of capillary bristles.

- 1 The main cauline leaves opposite. . . . . *Arnica*
- 1 The main cauline leaves alternate, or all basal
- 2 Phyllaries composed of 1 main row, the outer very short and often inconspicuous. . . . . *Senecio*
- 2 Phyllaries composed of several, well imbricated rows
- 3 Plants shrubs that are malodorous, aromatic or at least stipitate-glandular in part. . . . . *Ericameria*
- 3 Plants herbaceous, sometimes ± woody at the base
- 4 Strap-shaped corollas normally 2-3 per head. . . . . *Petradoria*
- 4 Strap-shaped corollas usually more than 6 per head
- 5 Leaves mostly all basal, mat-like, cauline highly reduced to almost lacking. . . . . *Stenotus*

- 5 Leaves not mat-like; cauline fairly obvious
  - 6 Inflorescence less than 10 heads; plants of alkaline places. . . . . *Pyrocoma*
  - 6 Inflorescence with well over 10 heads; plants not of alkaline places
    - 7 Strap-shaped corollas 6-10 mm long; heads not in one side arrays. . . . . *Chrysopsis*
    - 7 Strap-shaped corollas less than 6 mm long; heads most often in one sided arrays. . . . . *Solidago*

**Group 3** Heads with strap-shaped corollas marginal and yellow; juice clear; pappus of scales (these sometimes deeply cleft into several bristles), of firm awns, or lacking

- 1 Plants 4-6 cm tall, forming small mats or low mounds. . . . . *Townsendia*
- 1 Plants well over 6 cm tall, usually not forming small mats or low mounds
  - 2 Leaves all basal or if several cauline leaves present, than extremely small compared to the basal
    - 3 Leaves not conspicuously glandular-punctate
      - 4 Leaves pinnatifid or the base of leaf cordate to hastate. . . . . *Balsamorhiza*
      - 4 Leaves with the base cuneate to rounded. . . . . *Enceliopsis*
    - 3 Leaves conspicuously glandular-punctate. . . . . *Hymenoxys*
  - 2 Leaves of the stem well developed even though sometimes reduced
    - 5 Leaves dissected
      - 6 Rays white. . . . . *Tripleurospermum*
      - 6 Rays yellow
        - 7 Segments of the leaves short, these with some again toothed; plants of woodland. . . . . *Amariopsis*
        - 7 Segments of the leaves long, these entire; plants of saline soil. . . . . *Hymenoxys*
    - 5 Leaves not dissected
      - 8 Corolla tube stipitate-glandular. . . . . *Perityle*
      - 8 Corolla tube eglandular
        - 9 Cauline leaves with at least the lower opposite
          - 10 Leaves with well developed petioles. . . . . *Helianthus*
          - 10 Leaves mostly sessile. . . . . *Helianthella*
        - 9 Cauline leaves all alternate
          - 11 Leaves entire
            - 12 Leaf blade 0.2-0.6 dm long; rays 2-3 mm long . . . . . *Gutierrezia*
            - 12 Leaf blade 2-6 dm long; rays 25-60 mm long. . . . . *Wyethia*
          - 11 Leaves not entire
            - 13 Plants below 7000 ft., glabrous. . . . . *Grindelia*
            - 13 Plants above 10800, really hairy . . . . . *Hulsea*

**Group 4** Heads with strap-shaped corollas marginal, these not yellow; juice clear

- 1 Leaves pinnate; receptacle chaffy. . . . . *Achillea*
- 1 Leaves simple; receptacle naked
  - 2 Leaf tips spinulose-apiculate; phyllaries hyaline-margined. . . . . *Chaetopappa*
  - 2 Leaf tips rounded to acute; phyllaries not hyaline-margined
    - 3 Pappus of fairly stiff awns. . . . . *Townsendia*
    - 3 Pappus of capillary bristles
      - 4 Leaf margins serrate. . . . . *Machaeranthera*
      - 4 Leaf margins entire or pinnatifid
        - 5 Pistillate flowers more numerous than the disk-flowers, in several series, with short, narrow, inconspicuous rays scarcely if at all surpassing the disk
          - 6 Involucre 3-4 mm high; rays 0.5-1 mm long. . . . . *Conyza*
          - 6 Involucre 4-9 mm high; rays 2-3 mm long
            - 7 Herbage at least in part spreading-hirsute. . . . . *Trimorpha*
            - 7 Herbage glabrous except for the remotely hispidulous-ciliate margins of the leaves. . . . . *Aster*
        - 5 Pistillate flowers either fewer than the disk-flowers, or with more conspicuous rays, of both of these possible
          - 8 Phyllaries with some of them not uniform in color, whitish-chartaceous at base, purple-tipped or -margined, or green with whitish margins in part. . . . . *Aster*
          - 8 Phyllaries ± uniform in color. . . . . *Erigeron*

**Group 5** Heads lacking apparent strap-shaped corollas; pappus of  $\pm$  capillary bristles

- 1 Receptacle densely bristly
  - 2 Phyllaries subulate, inwardly hooked. . . . . *Arctium*
  - 2 Phyllaries of two kinds, outer very broad, inner row very narrow. . . . . *Acroptilon*
- 1 Receptacle not densely bristly
  - 3 Heads columnar, brown-black. . . . . *Rudbeckia*
  - 3 Heads not as above
    - 4 Phyllaries scarious at the tip or throughout
      - 5 Plants annual, taprooted. . . . . *Gnaphalium*
      - 5 Plants perennial, fibrous-rooted. . . . . *Antennaria*
    - 4 Phyllaries not scarious
      - 6 Plants shrubs, not dying back to the ground each year
        - 7 Flowers pale yellowish-green or white; phyllaries longitudinally striate; achenes 10-ribbed. . . . . *Brickellia*
        - 7 Flowers yellow; phyllaries not obviously striate; achenes not 10-ribbed
          - 8 Leaves copiously stipitate-glandular. . . . . *Ericameria*
          - 8 Leaves other than stipitate-glandular
            - 9 Phyllaries in a single series. . . . . *Tetradymia*
            - 9 Phyllaries in several series. . . . . *Chrysothamnus*
        - 6 Plants herbaceous, dying back to the ground each year
          - 10 Phyllaries longitudinally striate; achenes 10-ribbed. . . . . *Brickellia*
          - 10 Phyllaries not longitudinally striate; achenes not 10-ribbed
            - 11 Plants perennial
              - 12 Plants intricately branched, the branches bearing scale-like leaves. . . . . *Leucosyris*
              - 12 Plants not as above. . . . . *Erigeron*
            - 11 Plants annual
              - 13 Plants with an erect central stem. . . . . *Conyza*
              - 13 Plants lacing an obvious central stem, forming loose mats or open, low mounds. . . . . *Psathyrotes*

**Group 6** Heads lacking apparent strap-shaped corollas; pappus not of capillary bristles

- 1 Pappus of hyaline scales or 2 downwardly barbed awns
  - 2 Pappus of 2 downwardly barbed awns. . . . . *Bidens*
  - 2 Pappus of hyaline scales
    - 3 Flowers yellow. . . . . *Hymenopappus*
    - 3 Flowers white to pinkish. . . . . *Chaenactis*
- 1 Pappus lacking or a small crown
  - 4 Leaves divided or if simple than tridentate at apex
    - 5 Receptacle hairy
      - 6 Flowers bright yellow. . . . . *Sphaeromeria*
      - 6 Flowers not bright yellow. . . . . *Artemisia*
    - 5 Receptacle naked
      - 7 Heads of 2 kinds, staminate flowers in a spike, pistillate heads axillary. . . . . *Ambrosia*
      - 7 Heads  $\pm$  the same
        - 8 Plants perennial, if appearing annual, than leaflet margins serrate . . . . . *Artemisia*
        - 8 Plants annual, leaflets not serrate. . . . . *Matricaria*
  - 4 Leaves simple, not tridentate at apex
    - 9 Leaves toothed
      - 10 Leaves normally exceeding the not very obvious inflorescence; involucre nut-like with hooked prickles. . . . *Xanthium*
      - 10 Leaves not exceeding the obvious inflorescence; involucre not nut-like. . . . . *Iva*
    - 9 Leaves entire
      - 11 Inflorescence with single heads in the axils. . . . . *Iva*
      - 11 Inflorescence not axillary. . . . . *Artemisia*

**Group 7** Plants having spines on the leaf margins, on the end of branches, in leaf axils, prickles on the stem, or on the fruit

- 1 Leaf margins spinulose. . . . . *Eriocarpum*

- 1 Leaf margins not spinulose
- 2 Plants shrubs; spines in leaf axils or on the end of branches
  - 3 Spines in leaf axils. . . . . *Tetradymia*
  - 3 Spines on the end of branches. . . . . *Picrothamnus*
- 2 Plants herbs; fruit with spines or hooked prickles
  - 4 Fruit spiny. . . . . *Ambrosia*
  - 4 Fruit with hooked prickles. . . . . *Xanthium*

**Group 8** Receptacle bearing numerous bristles (Thistles)

- 1 Plants lacking pungent spines on the leaf margins
- 2 Leaves pinnate to entire, if entire very narrow; phyllaries other than subulate . . . . . *Centaurea*
- 2 Leaves ovate or broader; phyllaries subulate, inwardly hooked. . . . . *Arctium*
- 1 Leaf margins spiny
  - 3 Pappus composed of all barbellate bristles. . . . . *Carduus*
  - 3 Pappus composed of plumose bristles (at least in part). . . . . *Cirsium*

**ACHILLEA** Yarrow (Group 4)

*Achillea millefolium* L.

- a Plants below alpine, usually 3-10 dm tall; margins of phyllaries pale to brownish. . . . . var. *lanulosa*
- a Plants subalpine to alpine, usually 1-3 dm tall; margins of phyllaries dark brown to black. . . . . var. *alpicola*

var. *alpicola* (Rydb.) Garrett (Plate 65)

ALPINE YARROW. Fairly frequent, above 9000 ft.; open forest floors, rocky slopes. Jul-Aug. \*Lehman Creek T13N R68E S1.

var. *lanulosa* (Nutt.) Piper (Plate 66)

WESTERN YARROW. Frequent, below 8000 ft.; dryer meadows, riparian, mesic slopes. Jun-Aug. Lehman Creek T13N R69E S8, \*Strawberry Creek T14N R69E S20, !Burnt Mill Canyon T13N R69E S6.

**ACROPTILON** (Group 5)

*Acroptilon repens* (L.) DC. (Plate 67)

RUSSIAN KNAPWEED. Limited, below 6,000 ft.; along road margins; introduced from c. Asia. May-Aug. \*Cross Road T14N R70E S33. [*Centaurea r. L.*]

**AGOSERIS** (Group 1)

**Note:** In the latest works, *A. glauca* and *A. aurantiaca* have become a disarrayed mess. *A. aurantiaca* now has yellow-rayed plants. The plants that are called *A. elata* have no meaning at all. After having laid out all the specimens and having traveled all over looking at the *A. glauca* group of plants, it is the opinion of this author that there is no way to separate out taxa within this group of plants. The plants found on the Kaibab Plateau in Arizona have spindly short beaks which is different than any thing our plants have and yet they are called the same thing.

- 1 Flowers purplish, white or cream, drying either slightly purplish or cream to white
- 2 Flowers purplish; lower margins of the rays glabrous. . . . . *A. aurantiaca*
- 2 Flowers whitish, often drying pinkish on the lower surface. . . . . *A. white flowered phase*
- 1 Flowers yellow. . . . . *A. glauca*

*Agoseris* white-flowered phase

WHITE-FLOWERED MOUNTAIN DANDELION. Limited, 9600-10280 ft.; moist slopes in openings in forest. This taxon seems to be more related to the next rather than to *Agoseris glauca* complex. After the fire in the area close to the Mt. Washington road, the plants have disappeared. Jul-Aug. †Mt. Washington Road 733 040E 43 08 693N, †Timber Creek 737 858E 43 15 244N.

*Agoseris aurantiaca* (Hook.) Greene

var. *purpurea* (A. Gray) Cronq. (Plate 68)

PURPLE-FLOWERED MOUNTAIN DANDELION. Fairly frequent, 6000-10000 ft.; meadows. Jul-Aug. !Lehman Creek T13N R69E S8 Clifton 11714, \*Baker Creek T13N R69E S21, †South Fork Baker Creek 738470E 4317220N Clifton 48842.

***Agoseris glauca*** (Pursh) Raf.var. ***laciniata*** (D. C. Eat.) Sm. (Plates 69a, b)MOUNTAIN DANDELION. Frequent, 6500-10600 ft.; open, dry slopes, openings in woodlands. This is the one most often encountered in this complex. May-Jul. !Buck Mountain T14N R68E S36, Lehman Creek T13N R69E S7, †South Fork Baker Creek 737 309E 43 14 946, Shoshone Ponds 723 496E 43 12 590N Clifton 43918. [*A. parviflora* (Nutt.) Dietr.].**AMAURIOPSIS** (Group 3)***Amauriopsis dissecta*** (A. Gray) Britt. (Plates 70a, b)CUT-LEAVED BAHIA. Infrequent, 6000-9500 ft.; openings in conifer forest in gravelly or rocky soil. This is apparently the northern extent of this taxon in Nevada. This plant could easily be kept in the genus *Bahia*. Aug-Sep. \*Snake Creek T12N R69E S9. [*Bahia d.* (A. Gray) Rydb.]**AMBROSIA** (Group 6, 7)

1 Pistillate involucre normally armed with spines, rarely not armed; staminate involucre wide open, evidently lobed

..... ***A. acanthicarpa***1 Pistillate involucre with short subulate spines at apex; staminate involucre cupulate, scarcely lobed. . . . . ***A. artemisiifolia******Ambrosia acanthicarpa*** Hook. (Plate 73)

ANNUAL BUR-SAGE. below 7000 ft.; along road margins. Aug-Sep.

***Ambrosia artemisiifolia*** L.

COMMON RAGWEED. Fairly frequent, below 7000 ft.; along road margins and ditch banks, old fields; introduced from e. and c. US. Jun-Sep. !Lehman Creek T13N R69E S12, Clifton 11705.

**ANTENNARIA** Everlasting (Group 5)1 Heads solitary; plants almost acaulescent, usually less than 4 cm tall. . . . . ***A. dimorpha***

1 Heads several to many; plants caulescent, often over 4 cm tall

2 The distal scarious portion of the phyllaries whitish to pinkish

3 Scarious portion of the phyllaries scarcely or not at all darkened at the base

4 Involucre 4-7 mm tall; pistillate corollas mostly 2.5-4.5 mm long. . . . . ***A. microphylla***4 Involucre 7-11 mm tall; pistillate corollas mostly 5-8 mm long. . . . . ***A. parvifolia***3 Scarious portion of the phyllaries with a dark spot at the base; margins serrate. . . . . ***A. corymbosa***

2 The distal portion of the phyllaries straw-colored to brownish, or dark black-green

5 The distal portion of the phyllaries straw-colored, greenish to brownish, these normally broader and rounded

at apex. . . . . ***A. umbrinella***5 The distal portion of the phyllaries dark black-green, these normally narrow and more pointed. . . . . ***A. media*****Note:** This is a very complex group of plants with sexual forms that have an identity of their own, but the polyploid apomict plants pass freely into apomict plants of one another.***Antennaria corymbosa*** E. Nelson. (Plate 71)

CORYMBOSE EVERLASTING. Infrequent, 9000-11500 ft.; subalpine to alpine turf. May-Jul. \*Wheeler Peak T13N R68E S15.

***Antennaria dimorpha*** (Nutt.) T. & G.

LOW EVERLASTING. Fairly frequent, below 9000 ft.; dry, gravelly slopes and flats. Apr-Jun. \*Big Wash T12N R70E S27.

***Antennaria media*** Greene (Plates 72a, b)

ALPINE EVERLASTING. Infrequent, above 10000 ft., open rocky slopes, sometimes among small trees. Jul-Aug. \*Stella Lake

***Antennaria microphylla*** Rydb. (Plates 74a, b, c, d)SMALL LEAVED EVERLASTING. Frequent, 5000-11000 ft.; open, dry places. The gynoeceous *A. rosea* along with its varieties have the same distribution as this taxon and are not recognized in this treatment. May-Jul. \*Below Stella Lake T13N R68E S11, Baker Creek 738 652E 43 18 302N, !Wheeler Peak Campground T13N R68E S11, Chalk Spring 738 254E 43 57 820N, †Mill Creek 736 140E 43 23 766N Clifton 48888.***Antennaria parvifolia*** Nutt. (Plates 75a, b)LARGE-HEADED EVERLASTING. Limited about 9800 ft.; openings in conifer forest. This is the first record north of the Charleston Mountains for the state of Nevada. The plants from the Charleston Mountains have smaller heads than normal, but the plants from this area have the larger heads, so it is not easily confused with *A. microphylla*. Jun-Jul. \*Snake Creek T12N R69E S6, †North Fork Baker Creek 734 928 43 17 067 Clifton 43288.

***Antennaria umbrinella*** Rydb. (Plates 76a, b)

BROWN EVERLASTING. Fairly frequent, 7800-12000 ft.; open rocky slopes, openings in forest. These plants are intermediate between *A. microphylla* and *A. media*. The sexual forms have an identity of their own. Jul-Aug. \*Stella Lake T13N R68E S11, †Highland Ridge 7 34 357E 43 07 856N Clifton 45275.

**ARCTIUM** (Group 5, 8)***Arctium minus*** (Hill) Bernh. (Plates 77a, b)

LESSER BURDOCK. Infrequent, below 7000 ft.; moist meadows; introduced from Eurasia. Jul-Oct. !Willow Patch Spring T15N R68E S36, \*Strawberry Creek T14N R69E S20, Caine Spring 755188E 4336099N Clifton 47302.

**ARNICA** (Group 2)

**Note:** This group of plants are in an absolute mess, with many plants from various places that don't look like any named plants. There are two forms of *A. cordifolia* in this area.

- 1 Cauline leaves mostly 5-12 pairs
  - 2 Phyllaries acute, tips on the inner surface no more hairy than any where else. . . . . *A. longifolia*
  - 2 Phyllaries more obtuse, tips on the inner surface with a tuft of long hair. . . . . *A. chamissonis*
- 1 Cauline leaves mostly 2-4 pairs
  - 4 Basal leaves cordate. . . . . *A. cordifolia*
  - 4 Basal leaves acute at the base. . . . . *A. mollis*

***Arnica chamissonis*** Less. (Plate 79)

MEADOW ARNICA. Infrequent, 5500-10000 ft.; meadows, sometimes in riparian. Jul-Aug. !Lehman Creek T13N R69E S8 Clifton 11247, \*Strawberry Creek T14N R68E S26, \*Stella Lake 732 277E 43 20 654N.

***Arnica cordifolia*** Hook.

var. *cordifolia* (Plates 81a, b)

HEART LEAF ARNICA. Fairly frequent, 9000-10000 ft.; in open woods and in thickets along streams. There are two forms of this taxon. One form has the middle cauline leaves coarsely dentate and deeply cordate as at Wheeler Peak Campground. The other form has the middle cauline leaves essentially entire and truncate to rounded at the base as at Johnson Lake area May-July: !Wheeler Peak Campground 39° 00' 38" 114° 18' 22" Clifton 11044, Timber Creek 738 106E 43 16 126N, †Johnson Lake area 734 270E 43 13 228N Clifton 43248.

***Arnica longifolia*** D. C. Eat. (Plates 80a, b)

LONG-LEAVED ARNICA. Locally frequent, 9000-10800 ft.; talus slopes, along streams. These plants are nothing but part of the *A. chamissonis* complex Jul-Aug. \*Wheeler Peak Road 735 003E 43 23 398N, south of Johnson Lake 733 933E 43 12 652N.

***Arnica mollis*** Hook. (Plates 81a, b)

CORDILLERAN ARNICA. Infrequent, 9000-11,000 ft.; moist places in woodland, along streams. Jul-Sep. \*Lehman Creek T13N R68E S11, †Baker Creek 734 400E 43 15 450N Clifton 41002, Timber Creek 738 079E 43 16 082N.

**ARTEMISIA** Sagebrush (Group 6)

- 1 Receptacle beset with long hairs between the flowers. . . . . *A. frigida*
- 1 Receptacle glabrous or hairs short
  - 2 Leaves scarcely or lacking any tomentose hairs
    - 3 Leaves mostly pinnate or pinnatifid
      - 4 Plants woody at their base. . . . . *A. pygmaea*
      - 4 Plants herbaceous
        - 5 Leaflet margins serrate; plants annual to biennial; low elevation. . . . . *A. biennis*
        - 5 Leaflets entire to few toothed; plants perennial; high elevation. . . . . *A. michauxiana*
    - 3 Leaves entire to 3-lobed. . . . . *A. dracuncululus*
  - 2 Leaves evidently tomentose at least below
    - 6 Leaves entire, pinnatifid or lobed if lobed lobes not limited to the apex
      - 7 The phyllaries broadly ovate with the greenish mid-strip narrower than the hyaline margin. . . . . *A. michauxiana*
      - 7 The phyllaries not as broad and with the greenish mid-strip as wide as the scarious margin. . . . . *A. ludoviciana*
    - 6 Leaves mostly 3-lobed at apex
      - 8 Herbage most often greenish; leaves with many small green dots under the tomentum; involucre essentially glabrous. . . . . *A. nova*

- 8 Herbage whitish; leaves with only a few or no green dots; involucre more or less tomentose  
 9 Branches of inflorescence few and quite short or none. . . . . *A. arbuscula*  
 9 Branches of inflorescence more and quite long giving it a bushy look. . . . . *A. tridentata*

***Artemisia arbuscula*** Nutt. (Plates 82a, b)

LITTLE SAGEBRUSH. Frequent, below 9000 ft.; open, fairly shallow soil. Aug.-Sep. \*Wheeler Peak Road T13N R69E S6.

***Artemisia biennis*** Willd. (Plates 83a, b)

BIENNIAL WORMWOOD. below 5500 ft.; along upper margins of lake shores and sandy places along streams; introduced from NW US. Aug.-Oct. \*Pruess Lake T22S R19W S20.

***Artemisia dracunculus*** L. (Plates 84a, b)

DRAGON SAGEWORT, TARRAGON. Frequent, below 10000 ft.; along roads, open dry places. Jul-Oct. \*Wheeler Peak Road T13N R69E S6, !Osceola Road T14N R67E S14, North Fork Big Wash 743 061E 43 08 336N.

***Artemisia frigida*** Willd. (Plates 85a, b)

FRINGED or MOUNTAIN SAGEBRUSH. Infrequent, more common in the North Snake Range, 6000-10,000 ft.; dry, open places. Jun-Sep. Strawberry Creek 8600 ft. Ray Jaendl., Timber Creek 737 843E 43 15 073N.

***Artemisia ludoviciana*** Nutt.

- a Inflorescence composed of numerous wand-like branches with fairly well spaces heads. . . . . var. *albula*  
 a Inflorescence more narrow and congested, with fairly crowded heads  
 b Upper leaf surface whitish-gray; plants not near as aromatic as the next. . . . . var. *latiloba*  
 b Upper leaf surface green, usually not very hairy; plants very aromatic. . . . . var. *incompta*

var. *albula* (Woot.) Shinn. (Plates 86a, b)

WAND WESTERN MUGWORT. Infrequent, below 8000 ft.; rocky slopes and dry creek beds. Mid Aug-Oct. Hendrys Creek 750 426E 43 45 112N Clifton 47287.

var. *incompta* (Nutt.) Cronq. (Plates 87a, b)

CUTLEAF WESTERN MUGWORT. Fairly frequent, 6500-11000 ft.; dry creek margins and other dry open places. This taxon is often confused with *A. michauxiana*. It most likely is not a variety of *A. ludoviciana*. Jul-Oct. \*Baker Creek T13N R69E S21, Hampton Creek 749 481E 43 48 040N (NAD 83) Clifton 27310.

var. *latiloba* Nutt.

BROAD-LOBED MUGWORT. Fairly frequent, 6500-9000 ft.; dry open places. Jul-Oct. \*Baker Creek T13N R69E S22, !Lehman Creek T13N R69E S12, Clifton 11731, !Burnt Mill Creek T13N R69E S6.

***Artemisia michauxiana*** Bess. (Plates 88a, b)

LEMON SAGEWORT or MUGWORT. 8000-11000 ft.; open, rocky places, and open forest floors. Jul-Aug. \*above Johnson Lake T13N R68E S36, Highland Ridge Road 734 381E 43 08 183N, !Baker Creek T13N R68E S26.

***Artemisia nova*** A. Nels.

var. *nova* (Plates 89a, b)

BLACK SAGEBRUSH. Frequent, below 11000 ft.; dry, shallow soil in open places. Jul-Oct. !Baker Creek 738 652E 43 19 478N, \*Snake Creek T12N R69E S10.

***Artemisia pygmaea*** A. Gray (Plates 90a, b)

PYGMY SAGEBRUSH. Limited, 6600 ft.; open barren places among junipers. Aug.-Sep. \*Red Ledges T9N R69E S6.

***Artemisia tridentata*** Nutt.

Despite what is said about how easy it is to tell the difference between the named varieties out in the field, it is not in the area of this treatment. There are places in this area where there are big tall bushes that become smaller as they ascend to well above 9800 ft., without any difference in the type of inflorescence. Some tall plants have the inflorescence of var. *vaseyana* but the smell of var. *wyomingensis*. Some plants have the inflorescence of variety *tridentata* but are at a higher elevation and in shallower soil. There seems to be other combinations that don't seem to fit. Maybe in some areas these plants behave like they are supposed to. It is also quite possible that there are more varieties to be named or that there is more of a contiguum of variation within a single species than one would admit.

- a Inflorescence arising from various levels giving the bush a rounded look; herbage with a more spicy odor, almost stinks in some of the taller types that grow on valley floors  
 b Plants of deep soil, generally over 1 m tall; inflorescence generally large and broad . . . . . var. *tridentata*  
 b Plants of shallow soil, generally not much taller than 1 m; inflorescence smaller. . . . . var. *wyomingensis*  
 a Inflorescence arising from about the same level giving the bush a ± flat look; herbage with a fairly sweet camphor-like smell. var. *vaseyana*

var. *tridentata* (Plates 91a, b)

BIG SAGEBRUSH. Frequent, below 7500 ft.; valley floors, broad canyon bottoms. There are plants along Lake Creek that are 8 ft. tall. Late Jul-Oct. \*Big Springs Creek T10N R70E S1, North Fork Big Wash 743 061E 43 08 336N.

var. *vaseyana* (Rydb.) B. Boivin (Plate 92)

VASEY'S SAGEBRUSH. Frequent, 6000-10000 ft.; open slopes, canyons, ridges, and among pinyon and juniper. Most of the plants within the confines of the Park belong here. It has a pleasing smell of camphor. Jul-Oct. \*Wheeler Peak Road T13N R69E S6, Timber Creek 737 668E 43 15 206N.

var. *wyomingensis* (Beetle & Young) S. Welsh

WYOMING SAGEBRUSH. This taxon may be in this area if it is real.

#### ASTER (Group 4)

**Note:** All the species below have been put into the genus *Symphotrichum*. **Before they change genera they should get what they call species right.** There are more plants that haven't read the keys than have. In the most recent works the keys mean nothing, they tried, but the plants are way to variable, or most likely there are way more taxa lacking names or there are more crosses than real taxa. The characters use to separate *A. ascendens* and *A. spathulatus* are a bald face lie. The characters used to describe *A. ascendens* are not correlatable with the plants on the ground. Each population from one area or the other, seem to have their own set of characters, which workers have tried to cram into a single wide spread species. This author has only one sheet from Cave Spring in Lincoln County, Nevada that has fairly dense hairs on the faces of the phyllaries as described in FNANM 2006. One sheet from NE Utah has a few hairs on the face of the phyllaries. All the rest of the sheets from California, Nevada, and Utah have glabrous faces which should make them *A. spathulatus*, however most of them have fairly dense intertwining or strigose hairs below the heads which would make them *A. ascendens*. All keys that have ever been written for this group essentially lie. This author has tried to figure out this group for almost 40 years without any kind of success.

- 1 Rays short, inconspicuous. . . . . *A. frondosus*
- 1 Rays conspicuous
  - 2 Plants below 9000 ft., most of the plants in a population generally over 2.5 dm tall
    - 3 Plants growing in fairly dense patches; the lower involucral bracts fairly foliaceous, often longer than the inner. *A. eatonii*
    - 3 Plants not growing in dense patch, if growing in dense patches, than bracts not as above
      - 4 The rays long tapered to their base. . . . . *A. 'accedens'*
      - 4 The rays not tapered. . . . . *A. 'variabilis'*
  - 2 Plants above 9000 ft.; generally up to 2.5 dm tall. . . . . *A. foliaceus*

*Aster* 'accedens' (Plates 93a, b)

CLOSE TOO ASTER. Fairly infrequent, below 9100 ft.; wet meadows; outflow from springs. As the photo show, the flowering heads are very showy. These plants are not like anything else. Aug.-Sep. †Caine Spring 755 174E 43 36 060 Clifton 52145.

*Aster eatonii* (A. Gray) J. T. Howell (Plates 94a, b, c)

EATON ASTER. Fairly frequent, below 9000 ft.; along streams, in riparian and about seeps. Jul-Sep. \*Baker Creek T13N R69E S13, †Lehman Creek T13N R69E S8 Clifton 11717, †Snake Creek 746410E 4310612N, Hendrys Creek 750 554E 43 45 030N Clifton 47289. [*Symphotrichum e.* (A. Gray) Nesom].

*Aster foliaceus* Lindl.

var. *apricus* A. Gray (Plate 95)

ALPINE LEAFY ASTER. Fairly frequent, 9000-10000 ft.; moist, often wooded places. Jul-Sep. \*Lehman Creek T13N R68E S11, †Dead Lake 736 142E 43 13 005N. [*Symphotrichum f.* (DC.) Nesom var. *a.* (A. Gray) Nesom]

*Aster frondosus* (Nutt.) T. & G. (Plate 96)

SHORT-RAYED ALKALI ASTER. Rare, below 6800 ft.; moist, usually saline ground. Late Jul-Sep. \*The Cedars T12N R67E S2. [*Symphotrichum f.* (Nutt.) Nesom].

*Aster* 'variabilis' (Plate 97)

MIXED-UP ASTER. Fairly frequent, below 9000 ft.; along streams, meadows. This author has sheets of these plants with not one looking like the others. They can have the stems glabrous to hairy or hairs sometimes in lines; basal leaves long petiolate or almost sessile, present or lacking at flowering, very narrow to fairly broad; the bracts of the heads are extremely variable; rays from white, pinkish, blue, violet, or purple. The range of these variable plants is about the same. Jul-early Sep. \*Hamlin Valley T10N R70E S1, †Baker Creek 738 925E 43 18 597N Clifton 38405, Baker Creek 743 328E 43 20 032N Clifton 47303. [*A. ascendens* Lindl., *A. hesperium* A. Gray, *A. occidentalis* (Nutt.) T. & G., *A. spathulatum* Lindl., *Symphotrichum a.* (Lindl.) Nesom, *Symphotrichum lanceolatum* (Willd.) Nesom var. *h.* (A. Gray) Nesom, *Symphotrichum s.* (Lindl.) Nesom..]

#### BALSAMORHIZA Balsamroot (Group 3)

**Note:** The plants in the *B. hookeri* complex are a problem that most likely has no real answer. In this treatment they are left as varieties off a single species.

- 1 Leaves dissected, sometimes remotely so
- 2 Leaves uniformly dissected, rachis narrow..... *B. hookeri*
- 2 Leaves irregularly dissected, rachis often broad..... *B. ×terebinthacea*
- 1 Leaves entire and sagittate ..... *B. sagittata*

***Balsamorhiza hookeri*** Nutt.

var. *hispidula* (W. M. Sharp) Cronq. (Plates 98a, b)

HOOK'S BALSAMROOT. Frequent, below 8500 ft.; open, dry slopes and flats. May-Jun. !Mill Creek T14N R68E S5, \*Osceola Road T14N R68E S5, Baker Creek 738 852E 43 18 374N.

***Balsamorhiza sagittata*** (Pursh) Nutt. (Plates 99a, b)

ARROWLEAF BALSAMROOT. Frequent, below 10000 ft.; open, dry slopes and flats. May-Jul. !Lehman Creek T13N R69E S8, \*Baker Creek 738 680E 43 17 590N Clifton 48849.

***Balsamorhiza ×terebinthacea*** (Hook.) Nutt. (Plate 100)

INTERMEDIATE BALSAMROOT. Widely scattered, below 9000 ft.; on open slopes in sage brush. This is said to be a cross only between *B. deltoidea* and with *B. hookeri* however the crosses that involve *B. sagittata* and *B. hookeri* complex look about the same as the cross between the former. Since these plants coss when ever they come together (quite frequent) the epithet used here covers all these crosses until someone comes up with some other. \*Baker Creek 738 900E 43 18 520N Clifton 48807.

**BIDENS** (Group 6)

***Bidens cernua*** L. (Plate 101)

BUR-MARIGOLD. Limited, valley floors, margins of streams. Jul-Aug. †Lake Creek 760 026E 43 06 776N Clifton 41063, †Caine Spring 755 188E 43 36 118N Clifton 47299.

**BRICKELLIA** (Group 5)

- 1 Leaves entire, oblong. .... *B. oblongifolia*
- 1 Leaves serrate or irregularly toothed, obovate
- 2 Leaves 2-8 cm long; petioles fairly long. .... *B. californica*
- 2 Leaves 0.5-2 cm long; petioles very short. .... *B. microphylla*

***Brickellia californica*** (T. & G.) A. Gray (Plate 102)

CALIFORNIA BRICKELLBUSH. Infrequent, below 7500 ft.; dry margins of streams. Aug.-Oct. !Lehman Creek T13N R69E S12.

***Brickellia microphylla*** (Nutt.) A. Gray (Plates 103a, b)

SMALL-LEAVES BRICKELLBUSH. Infrequent, below 7000 ft.; rocky slopes. Late Aug-Sep. Big Wash 755 036E 43 07 796N, Hendrys Creek 751 366E 43 44 530N, Marble Wash 745 573E 43 69 727N Clifton 48952.

***Brickellia oblongifolia*** Nutt. (Plates 104a, b)

var. *oblongifolia*

OBLONG-LEAVED BRICKELLBUSH. Below 8500 ft.; cliffs and steep rocky slopes, often on limestone. Jul-early Aug. \*Snake Creek T12N R69E S10, branch of Lincoln Creek T12N R68E S26.

**CARDUUS** (Group 8)

***Carduus nutans*** L. (Plates 105a, b)

MUSK THISTLE. Infrequent, below 8200 ft.; along road margins, in old road beds, margins of disturbed meadows; introduced from Eurasia. Jul-Sep. \*Lincoln Canyon T12N R68E S27, Baker Creek 738 925E 43 18 447N, Baker Creek 738 170E 43 17 423N, †Snake Creek 743 554E 43 11 160N Clifton 48835

**CENTAUREA** (Group 8)

- 1 Outer phyllaries spine tipped and pectinate spinose-ciliate. .... *C. virgata*
- 1 Outer phyllaries lacking a spine at tip and ciliate on the margins, but not spinose. .... *C. micranthos*

***Centaurea micranthos*** S. G. Gmel. (Plate 106)

SPOTTED KNAPWEED. Infrequent, below 8000 ft.; waste places as along roads, may get into some native habitat next to the roads; introduced from Europe. Mid Jul-Sep. Snake Valley T13N R70E S5, \*Baker Creek 738 685E 43 17 595N, Sacramento Pass 39° 08' 41" 114° 20' 13.7", !Lehman Creek T13N R69E S12. [*C. biebersteinii* DC. *C. maculosa* Lam., *C. stoebe* L. ssp. *micranthos* (Gugl.) Hay.].

***Centaurea virgata*** Lam.

VIRGATE KNAPWEED. Infrequent, below 6000 ft.; along roads and other disturbed places; introduced from Asia. Jul-Aug. †Snake Creek 751 262E 43 11 635N Clifton 42929.

**CHAENACTIS (Group 6)**

- 1 The involucre glandular hairy at least in part
- 2 Pappus scales 10-16; involucre 8-12 mm tall. . . . . ***C. douglasii***
- 2 Pappus scales 4; involucre 5-9 mm tall. . . . . ***C. stevioides***
- 1 The involucre lightly tomentulose-puberulent (may have sessile gland drops). . . . . ***C. macrantha***

***Chaenactis douglasii*** (Hook.) H. & A.

- a Plants compact, from ± branched caudex, stems shortened. . . . . var. ***montana***
- a Plants more open, lacking a well developed caudex, stems often taller. . . . . var. ***douglasii***

var. ***douglasii*** (H. & A.) A. Nels. (Plates 107a, b, c)

DUSTY MAIDEN. Fairly frequent, below 11000 ft.; often grows in loose fine gravel along roads and dry gravelly, open places on slopes. This and the next variety passes freely with each other and are often not definable. However in many places they seem to maintain their own identity. Jul-Aug. \*Snake Creek T12N R69E S8, Chalk Spring 738 254E 43 57 820N Clifton 47269.

var. ***montana*** M.E. Jones

MOUNTAIN DUSTY MAIDEN. Infrequent, below 8500 ft.; sandy places. May-Aug. \*Hamlin Valley T10N R70E S13.

***Chaenactis macrantha*** D. C. Eat. (Plates 108a, b)

LARGE-FLOWERED PINCUSHION. Infrequent, below 6000 ft.; gravelly slopes. May-Jun. \*Highway 487 745 247E 43 27 439N Clifton 44002.

***Chaenactis stevioides*** H. & A. (Plate 109)

BROAD-FLOWERED PINCUSHION. Infrequent, below 6200 ft.; sandy openings. Mar-Jun. \*Hamlin Valley T10N R70E S12

**CHAETOPAPPA (Group 4)*****Chaetopappa ericoides*** (Torr.) G. Nesom (Plate 110)

ROSE-HEATH. Infrequent, below 8000 ft.; open dry slopes and flats. May-Aug. Baker Creek Road 741 523E 43 20 190N. [*Leucelene e.* (Torr.) Greene].

**CHRYSOPSIS nom. cons. Golden Aster (Group 2)*****Chrysopsis villosa*** (Pursh) Nutt.

var. ***scabra*** Eastw. (Plates 111a, b)

MINOR GOLDEN ASTER. below 11000 ft. Jul-Sep. Baker Creek Trail 8200 ft. Fred Landau, †Baker Creek 737 570E 43 17 180N, North Fork Big Wash 35 994E 10 179N Clifton 44534. [*Heterotheca v.* (Pursh) Shinners var. *s.* (Eastw) Semple].

**CHRYSOTHAMNUS Rabbit-Bush (Group 5)**

**Note:** All the taxa below have been put in the genus *Ericameria* except *C. albidus*, *C. puberulus*, and *C. viscidiflorus*. All the plants with tightly hairy branchlets, including *Ericameria discoidea* could just as easily be put in their on genus.

- 1 Flowers white. . . . . ***C. albidus***
- 1 Flowers yellow
- 2 Twigs pannose (very tightly tomentose)
- 3 Phyllaries acute, appressed. . . . . ***C. nauseosus***
- 3 Phyllaries acuminate, spreading at the tip. . . . . ***C. parryi***
- 1 Twigs glabrous or spreading-hirtellous
- 4 Involucral bracts obtuse to acute

- 5 The branchlets and leaves grayish green. . . . . *C. puberulus*  
 5 The branchlets and leaves green  
 6 The stems and leaves essentially glabrous, leaves may be ciliate on the margins . . . . . *C. viscidiflorus*  
 6 The stems and or the leaves or both short hairy  
 7 The leaves with one main vein, quite narrow.. . . . *C. puberulus* × *viscidiflorus*  
 7 The leaves with 3 or 5 nerves and 2-6 mm wide. . . . . *C. lanceolatus*  
 4 Involucral bracts, when young, ± folded inward making them appear acuminate, generally with the tips out curved  
 . . . . . *C. greenei*

***Chrysothamnus albidus*** (A. Gray) Greene (Plates 112a, b)

WHITE-FLOWERED RABBIT-BRUSH. Locally frequent, below 6000 ft.; valley floors that are somewhat saline. Aug-Sep. \*Big Springs Creek T10N R70E S1, †Shoshone Ponds 723380E 4312580N Clifton 44984. [*Ericameria a.* (M. E. Jones ex A. Gray) L. C. Anderson].

***Chrysothamnus greenei*** (A. Gray) Greene (Plates 113a, b)

GREENE'S RABBIT-BRUSH. Infrequent, below 5500 ft.; valley floors. Jul-Aug.

***Chrysothamnus nauseosus*** (Pall. ex Pursh) Britton

a Involucre glabrous

b Achenes glabrous; leaves small (seldom over 2.5 cm long and often largely deciduous before anthesis. . . . . var. *leiospermus*

b Achenes hairy; leaves usually over 2.5 cm long, not deciduous before anthesis greenish. . . . . var. *oreophilus*

a Involucre hairy, sometimes limited to the outer phyllaries

c Corolla lobes 1.2-2.0 mm long; style-appendages usually longer than the stigmatic portion. . . . . var. *speciosus*

c Corolla lobes 0.4-1.2 mm long; style-appendages mostly shorter than the stigmatic portion. . . . . var. *hololeucus*

var. *hololeucus* (A. Gray) H. M. Hall

GRAY RUBBER RABBITBRUSH. Frequent, below 9000 ft; open places. \*Wheeler Peak Road T13N R69E S6.[*Ericameria n.* (Pall. ex Pursh) G. L. Anderson & G. I. Bird var. (*h.* (A. Gray) G. L. Nesom)].

var. *leiospermus* (A. Gray) H. M. Hall (Plates 114a, b)

FEW-LEAVED RUBBER RABBITBRUSH. Infrequent, below 8000 ft.; crevices in bluffs. Late Aug-Sep. \*Red Ledges T9N R69E S6. [*Ericameria n.* (Pall. ex Pursh) Britt. var. *l.* (A. Gray) G. L. Nesom & G. I Bird].

var. *oreophilus* (A. Nels.) H. M. Hall (Plate 115)

YELLOW-GREEN RABBIT-BRUSH. Frequent, below 7000 ft.; valley floors and canyons. Aug-Sep. \*Strawberry Creek T14N R69E S20. [*Ericameria n.* (Pall. ex Pursh) Britt. var. *o.* (A. Nels.) G. L. Nesom & G. I Bird].

var. *speciosus* (Nutt.) H. M. Hall

COMMON RABBIT-BRUSH. below 11000 ft. This taxon is said to be all over the Great Basin, but it seems to be a plant that is hard to place within this group of plants. July-Oct.[*Ericameria n.* (Pall. ex Pursh) Britt. var. *s.* (Nutt.) G. L. Nesom & G. I Bird

***Chrysothamnus parryi*** (A. Gray) Greene

var. *parryi* (Plate 116)

PARRY'S RABBIT-BRUSH. Infrequent, below 8500 ft.; slopes with other shrubs. Late Jul-Aug. \*† Snake Creek 738 833E 43 11 850N. [*Ericameria p.* (A. Gray) G. L. Nesom & G. I Bird].

***Chrysothamnus viscidiflorus*** (Hook.) Nutt (Plates 117a, b, c)

There are many forms within this group with various combinations of characters. There have been a number named. This author has looked at many collections and the plants out in the field in much of their range. The conclusion he reached is that there is no way to separate all the variability. In one place the plants are quite diagnostic, but the next place they look quite different. There are way too many places where they are different. There are plants that are hairy or glabrous that have leaves with a single mid nerve. There are plants that are hairy or glabrous with leaves that are 3 nerved. There are plants that have the inflorescence branches short making it compact, branches elongate making it quite open. The varieties that have been named are very simplistic and not real.

STICKY RABBIT-BRUSH. Frequent, below 10200 ft., most no forested habitats. Jul-Sep. \*Wheeler Peak Road T13N R69E S6, Horse Heaven 743 240E 43 14 244N Clifton 45300, †Big Canyon 740 770E 43 53 450N Clifton 52138, †Baker Creek Road 741 539E 43 19 938N, †Osceola Road T14N R67E S15, \*Snake Creek T12N R70E S18, †Lehman Creek Clifton 11730, Baking Powder Flat 721 824E 42 99 067N Clifton 52118. [*C. puberulus* (D. C. Eat.) Greene *C. v.* (Hook.) Nutt. var. *pumilus* (Nutt.) Hall & Clem.].

**CIRSIUM** Thistle (Group 8)

- 1 Stems conspicuously winged by the spiny-decurrent leaf-bases, these nearly or fully as long as the internodes. . . . *C. vulgare*
- 1 Stems lacking decurrent leaf-bases or if decurrent shortly so
  - 2 The heads unisexual; heads essentially spineless. . . . . *C. arvense*
  - 2 The heads with perfect flowers; heads with some spines
    - 3 Lower phyllaries spiny on the margins. . . . . *C. eatonii*
    - 3 Lower phyllaries usually entire
      - 4 At flowering, basal rosette present; inner phyllaries somewhat fringed at the apex. . . . . *C. scariosum*
      - 4 At flowering basal rosette lacking; inner phyllaries not fringed at apex
        - 5 Flowers pale lavender to whitish; phyllaries never having the same color as the flowers
          - 6 Lower phyllaries appressed (*inamoenum* group)
            - 7 Spines of the lower phyllaries robust with some up to 10 mm long; plants associated with *C. eatonii*. *C. 'spinescens'*
            - 7 Spines of the lower phyllaries not as robust, with some up to 6 mm long; plants not associated with *C. eatonii*
              - 8 Herbage densely white hairy at flowering; plants associated with alkali. . . . . *C. 'alcalinum'*
              - 8 Herbage with the surface showing through the hair; plants not associated with alkali. . . . . *C. inamoenum*
          - 6 Lower phyllaries spreading to reflexed. . . . . *C. neomexicanum*
- 5 Flowers crimson to carmine; at least the upper phyllaries about the same color as the flowers. . . . . *C. arizonicum*

**Note:** This is a very difficult group of plants that seem to cross with each other when they come into contact. Some of these ?crosses seem to form large stands, they are not sterile. Is it possibly that apomicts is involved?

***Cirsium*** 'alcalinum' (Plates 125a, b)

ALKALINE THISTLE. Rare, limited to Spring Valley; moist alkaline flats on the valley floor. This is a very distinctive form of *C. inamoenum*. Mid Jul-Aug. Spring Valley 720 580E 43 39 620N Clifton 52142.

***Cirsium arizonicum*** (A. Gray) Petr. (Plate 118)

ARIZONA THISTLE. Fairly frequent, 6500-10100 ft.; open, dry slopes. This is our only red-flowered, native thistle. Mid Jul-Aug. \*Snake Creek T12N R69E S10, North Fork Big Wash 742 138E 43 08 689N, †Snake Creek 738 211 43 14 206. [*Cirsium nidulum* (M. E. Jones) Petr.]

***Cirsium arvense*** (L.) Scop. (Plates 119a, b)

CANADA-THISTLE. Rare, below 6500 ft.; moist places; introduced from Eurasia. Jul-Aug. Highway 894 T13N R67E S22.

***Cirsium eatonii*** (A. Gray) B.L. Robins.

var. *viperinum* D. J. Keil (Plate 120)

SNAKE RANGE THISTLE. Fairly frequent, 10800-11400 ft. Jul-Aug. above Johnson Lake T13N R68E S35, Wheeler Peak T13N R68E S10, \*†Mt. Washington Road 733 406E 43 09 404N.

***Cirsium inamoenum*** (Greene) D. J. Keil

var. *inamoenum* (Plates 121a, b, c)

JACKSON HOLE THISTLE. Fairly frequent, below 10900 ft.; from desert scrub to upper conifer forest. The flower color varies from white, to very pale lavender. These plants have been identified as *C. wheeleri*, *C. calcareum*. The plants that grow along the Wallow River in Oregon has the herbage markedly different and so do the ones from Beaver and Cache Counties in Utah. There are forms that have short peduncles which make the inflorescence look congested and forms with long peduncles making the inflorescence more open. Jul-Aug.\*Spring Valley T13N R67E S9, Big Spring Wash 740 478E 43 00 280N (NAD 83) Clifton 49044, Water Canyon 736 730E 43 55 300N Clifton 52141. [*C. subniveum* Rydb.]

***Cirsium neomexicanum*** A. Gray (Plate 122a, b)

NEW MEXICO THISTLE. Infrequent, 7000-8500 ft.; dry, open slopes, often in sagebrush or pinyon-juniper woodland. Jun-early Jul. \*Close to Cave Canyon 748 058E 43 12 415N. [*C. utahensis* Petrak].

***Cirsium*** 'intermontanum' (Plates 123a, b, c, d, e, f)

In this area there is so much variability from one population to another that there is no way to name any taxa with any kind of certainty.

INTERMOUNTAIN THISTLE. Fairly frequent, below 7200 ft.; edges of meadows, alkaline valley floors, along margins of streams. These are part of the *C. scariosum* var. *americanum* complex. The plants in this area look different in different places. Late Jun-Mid Aug. \*The Cedars T12N R67E S3, \*Baker Creek T13N R69E S13, Hampton Creek 749590E 4347880N (NAD 83) Clifton 47086, north of Millick Spring 725350E 4356070N (NAD 83) Clifton 47193.

***Cirsium*** 'spinescens' (Plates 124a, b)

SUBALPINE THISTLE. Fairly frequent, 9000-10500 ft.; rocky slopes. These plants grow in a belt between *C. eatonii* and *C. inamoenum*. They have very little in common with *C. eatonii*. At first this author thought that these plants could be crosses with

*C. eatonii* but since they have no characters of that taxon except the robust spines, they can not be a cross. Jul-Aug. \*Mount Washington T12N R68E S14, †Mt. Washington Road 732 148E 43 08 186N Clifton 38455, Lincoln Peak 10600 ft. Ray Jaindl., North Fork Big Wash 736 978E 43 10 380N Clifton 43269.

***Cirsium vulgare*** (Savi) Ten. (Plates 126a, b)

BULL THISTLE. Locally frequent, below 8500 ft.; meadows and other moist places; introduced from Europe. This taxon usually doesn't become obnoxious, but in one meadow it has become very much so. Jun-Nov. \*Baker Creek 738 925E 43 18 597N, Baker Creek 743 467E 43 20 131N, †Lehman Creek T13N R69E S12.

#### CONYZA (Group 4, 5)

***Conyza canadensis*** (L.) Cronq. (Plates 130a, b)

HORSEWEED. Widely scattered, below 8000 ft.; disturbed moist or dry places. Jul-Sep. Strawberry Creek T14N R69E S20, †Baker Creek T13N R69E S14. [var. *glabrata* (A. Gray) Cronq., *Erigeron c. L.*]

#### CREPIS Hawksbeard (Group 1)

- 1 Leaves and stems other than tomentose
  - 2 Plants of alkaline meadows, with tall almost naked stems. . . . . *C. runcinata*
  - 2 Plants of talus, with flowers among the leaves. . . . . *C. nana*
- 1 Leaves and stems tomentose
  - 2 Rachis of the lower leaf very narrowly winged, rarely entire. . . . . *C. atribarba*
  - 2 Rachis of the lower leaf quite wide
    - 4 The main phyllaries bracts essentially glabrous, 5-8. . . . . *C. acuminata*
    - 4 The main phyllaries bracts tomentose-pubescent or setose or both, often more than 8
      - 5 The lower part of the stem bearing stout glandless bristles. . . . . *C. modocensis*
      - 5 The lower part of the stem if bristly, than these gland tipped
        - 6 Phyllaries bearing some glandular hairs. . . . . *C. occidentalis*
        - 6 Phyllaries lacking glandular hairs. . . . . *C. intermedia*

**Note:** All the species listed below (except *C. runcinata* belong to a polyploid-apomictic complex, therefore the following key is quite arbitrary. You will not be able to key out every plant. A number of varieties have been maintained even though they may intergrade. If these varieties are submerged some of the continuity between some of these taxa is lost.

***Crepis acuminata*** Nutt.

var. *acuminata* (Plates 127a, b)

LONG LEAF HAWKSBEARD. Widely scattered, below 9,000 ft.; dry, open slopes and flats, in sparse woodlands. Jul-Aug. Baker Creek 38° 59' 06.7" 114° 14' 51", †Lehman Creek T13N R69E S8, \*Timber Creek 738 624 43 16 880.

***Crepis atribarba*** A. Heller (Plates 128a, b)

SLENDER HAWKSBEARD. Infrequent, 6000-10000 ft.; dry open slopes and flats May-Jul. †Burnt Mill Canyon T13N R69E S6, Baker Creek 8200 ft Fred Landau, †Horse Heaven 742 540E 43 14 192N Clifton 54301, Chalk Spring 738 254E 43 57 820N, \*Mill Creek 736 140E 43 23 766N Clifton 48886. [*C. a.* A. Heller ssp. *originalis* Bab. & Stebb.].

***Crepis intermedia*** A. Gray (Plates 129a, b)

INTERMEDIATE HAWKSBEARD. Infrequent, 6000-10500 ft.; dry, open slopes and flats, openings in forest. The only way these plants can be told from var. *pumila* of *C. occidentalis* is if they have over 25 heads and are over 3 dm. tall. May-Jul. Lehman Creek T13N R69E S8, †Mt. Washington Road 733 040E 43 08 693N, †Timber Creek 738 647 43 16 929.

***Crepis modocensis*** Greene

var. *modocensis* (Plates 131a, b, c)

LOW HAWKSBEARD. Quite infrequent, above 5000 ft.; dry open rocky places. May-Jul. \*†Timber Creek 738 647E 43 16 929N Clifton 42905, Marble Wash 747 535E 43 69 948N Clifton 51304.

***Crepis nana*** Richards. (Plates 132a, b)

TALUS HAWKSBEARD. Infrequent, above 11200 ft.; talus-slopes. Mid Jul-Aug. \*†Lincoln Peak 734 409E 43 06 948N, †Highland Ridge 734 632E 43 06 132N Clifton 45278.

***Crepis occidentalis*** Nutt.

var. *pumila* (Rydb.) M. Peck (Plates 133a, b, c)

SLIM WESTERN HAWKSBEARD. Infrequent, 6800-10300 ft.; open woodlands, and open slopes in sagebrush. The difference between this and *C. intermedia* are often indistinguishable. The plants on Mt. Washington have slim heads like *C. intermedia* but have few heads and are not very tall. \*Mill Creek 736 140E 43 23 766N Clifton 48887. May-Jul.

***Crepis runcinata*** (E. James) T. & G.var. ***glauca*** (Nutt.) Boivin (Plates 134a, b)

GLAUCOUS MEADOW HAWKSBEARD. Local, below 6500 ft.; moist saline meadows. Jun-Jul: \*Big Springs Creek T10N R70E S1, The Cedars 723 809E 43 12 600N Clifton 40954, Silver Creek 740557E 4337820N (NAD 83) Clifton 47092. Strawberry Creek 738 064E 43 27 850N Clifton 51340

**ENCELIOPSIS** (Group 3)***Enceliopsis nudicaulis*** (A. Gray) A. Nels.var. ***nudicaulis*** (Plates 135a, b)

NAKEDSTEM. Limited, below 6400 ft. open rocky slopes. Apr-Jun. \*Big Springs Wash T9½N R69E S35, Marble Wash 748990E 4369460N Clifton 48963.

**ERICAMERIA** Golden-Weed (Group 2, 5)  
(Haplopappus in part)**Note:** Due to molecular garbage this genus has now become a dumping ground for all kinds of different looking plants. Some of the species from *Chrysothamnus* have been added to this genus. Not follow here. It is very obvious that the plants with the tomentose stems and the plants with the pannose stems in *Chrysothamnus* belong in there own genus.

- 1 Stems white tomentose; rays lacking. . . . . ***E. discoidea***
- 1 Stems other wise; rays present
  - 2 Leaves with margins ± crisped or wavy; involucre 10-16 mm. . . . . ***E. suffruticosus***
  - 2 Leaves entire; involucre 6-9 (9.5)
    - 3 Herbage villous-golden-glandular; plants somewhat malodorous
      - . . . . . ***E. watsonii***
    - 3 Herbage white short stipitate-glandular or lacking glands; plants not malodorous
      - 4 Stems of the season lacking glandular hairs and the herbage is not nearly as varnished as the next; none of the leaves over 1.5 mm wide. . . . . ***E. nana***
      - 4 Stems of the season short stipitate-glandular and strongly varnished; some of the leaves over 1.5 mm wide. . . . . cross

***Ericameria*** crossLimited, 6840-8600 ft.; under pinyon in fine gravelly soil among large boulders, rock outcrops in mountain mahogany scrub. This taxon may be a cross between *E. nana* and *E. watsonii*. The herbage smells like that of *Larrea* only on the pleasant side. The others don't. The leaving system is also different. Mid Aug-Sep. †Oscoole Road & Highway 50 733 123E 43 33 020N Clifton 44987, †Horse Heaven 745 500N 43 14 371N Clifton 45295.***Ericameria discoidea*** (Nutt.) G. Nesomvar. ***discoidea*** (Plates 136a, b)RAYLESS GOLDEN-WEED. Frequent, above 8000 ft.; roadside banks, rocky, open to sparsely wood slopes. The other variety is found in NE Utah. This is a very disconcerting feature in this genus. Jul-Aug. \*Wheeler Peak Road T13N R69E S6, †Pyramid Peak 733 939E 43 14 737N. [*Macronema d.* Nutt., *Haplopappus macronema* A. Gray].***Ericameria nana*** Nutt. (Plate 137)DWARF GOLDEN-BUSH. Infrequent, below 9000 ft.; rocky slopes and bluffs. Jul-Sep. Red Ledges T9N R69E S6, †Snake Creek 753 532 43 12 282. [*Haplopappus n.* (Nutt.) D. C. Eat.].***Ericameria suffruticosa*** (Nutt.) G. NesomBIG HEAD GOLDEN-BUSH. Locally frequent, 10000-11200 ft.; open slopes that are often quite rocky. Jul-Sep. Johnson Lake 734 017E 43 13 814N, \*†South of Johnson Lake 734 203E 43 13 078N. [*Haplopappus s.* (Nutt.) A. Gray].***Ericameria watsonii*** (A. Gray) Karteszvar. ***watsonii*** (Plate 139)WATSON'S GOLDEN-BUSH. Fairly frequent, below 9000 ft.; crevices. Mid Aug-Sep. Gray Cliff T13N R69E S22, \*Wheeler Peak Road T13N R69E S6, †Baker Creek 739 168E 43 18 674N, †Oscoole Road & Highway 50 733 123E 43 33 020N Clifton 44988, Chalk Spring 738 254E 43 57 820N. [*Haplopappus w.* A. Gray].**ERIGERON** Daisy (Group 4, 5)

- 1 Leaves divided. . . . . ***E. compositus***
- 1 Leaves entire

- 2 Plants creating an open tangled mass because of the proliferating stolons that often root at the tips, the stolons die each year leaving the rooted tip thus often creating a new plant. . . . . *E. flagellaris*
- 2 Plants not as above
- 3 Involucre bearing flattened multicellular hairs, some of these hairs over 1 mm long; plants from the alpine . . . . . *E. grandiflorus*
- 3 Involucre otherwise or if as above, than not from the alpine
- 4 Heads lacking rays or these very poorly developed
- 5 Leaves linear; stem hairs ± appressed; pistillate flowers absent. . . . . *E. bloomeri*
- 5 Leaves linear-oblongeolate to spatulate; stem hairs spreading; pistillate flowers present. . . . . *E. aphanactis*
- 4 Heads with well developed rays
- 6 Achenes mostly with 6,7 or most commonly 8 nerves; leaves silvery. . . . . *E. argentatus*
- 6 Achenes with 2 nerves; leaves gray to green
- 7 Stems and leaves stipitate-glandular, plants malodorous, aromatic. . . . . *E. nauseosus*
- 7 Stems and leaves not stipitate-glandular except the upper stem maybe a little glandular; not aromatic
- 8 Leaves essentially all basal, may have very small leaves or bracts on the scape
- 9 Leaves linear or nearly so. . . . . *E. compactus*
- 9 Leaves with blade subrotund to broadly oblanceolate. . . . . *E. uncialis*
- 8 Leaves not limited to the base
- 10 Basal leaves obviously triple-nerved, the marginal nerves weak only reaching half way up the blade. . . . *E. jonesii*
- 10 Basal leaves lacking obvious triple nerves
- 11 Leaves essentially glabrous or margins ciliate
- 12 Leaves glabrous; phyllaries glandular . . . . . *E. leiomerus*
- 12 Leaves ciliate on the margins; phyllaries bearing numerous septate hairs as well as glandular. . . . . *E. ursinus*
- 11 Leaves fairly hairy on the surfaces
- 13 Stem hairs widely spreading or at least on upper part, none of the hairs appressed
- 14 Main stems branching from a leafy base; plant a longer lived perennial
- 15 Outer pappi of setae; disc corolla tubes glabrous or slightly viscid-glandular . . . . . *E. pumilus*
- 15 Outer pappi of obvious scales; corolla tubes with sharp pointed hairs. . . . . *E. concinnus*
- 14 Main stem simple at immediate base; plant annual to a very short perennial. . . . . *E. divergens*
- 13 Stem hairs appressed. . . . . *E. tener*

***Erigeron aphanactis*** (A. Gray) Greene

var. *aphanactis* (Plates 138a, b)

BASIN RAYLESS FLEABANE. below 9500 ft.; limestone scabland May-Sep. Snake Creek 753 066E 43 12 770N, \*Lincoln Canyon 733 897E 43 08 008N Clifton 44556.

***Erigeron argenteus*** A. Gray (Plate 140)

SILVERY FLEABANE. Infrequent, below 8500 ft.; May-Jul. !Baker Creek Road 741 523E 43 20 190N !Osceola Road T14N R68E S5.

***Erigeron bloomeri*** A. Gray

BLOOMER'S FLEABANE. Infrequent, below 9700 ft.; dry rocky slope. Limited to the North Snake Range ? May-Jul.

***Erigeron compactus*** J. F. Blake

var. *compactus* (Plate 141)

CUSHION FLEABANE. Infrequent, below 7800 ft.; open, barren places. The other variety is found in the Colorado River drainage. May-Jun. \*Murphy Wash T10N R68E S10, Big Wash 744 172E 43 08 964N.

***Erigeron compositus*** Pursh

Most of these plants are apomictic and so the plants vary from one place to another, whether they have rays or not; hairy or subglabrous. The plants that are called var. *glabratus* are very hairy at times and may or may not have rays. Some workers prefer to have no varieties, which is justifiable, however where these two grow together you would think that there were two species present.

1 Leaves mostly 2-4 times ternate. . . . . var. *glabratus*

1 Leaves mostly once ternate. . . . . var. *discoideus*

var. *discoideus* A. Gray (Plate 210)

CUT LEAF FLEABANE. Fairly frequent, 10000-11500 ft.; rocky slopes. This name is unfortunate as these plants often have

rays. Jul-Sep. \*Mount Washington T12N R68E S11, Stella Lake T13N R68E S11, !Wheeler Peak Campground T13N R68E S11.

var. *glabratus* Macoun (Plates 211a, b)

FERN-LEAF FLEABANE. Infrequent, 10000-11500 ft.; rocky slopes, often on talus. Jul-Aug. \*†Bald Mountain 732 537E 43 22 032N.

*Erigeron concinnus* (H. & A.) Dorn (Plate 142)

var. *concinnus*

HAIRY FLEABANE. Fairly frequent, below 9000 ft.; dry, open slopes. There are no other discernable differences between this taxon and *E. pumilus* other than those given in the key. May-Aug. \*The Cedars T12N R67E S2, \*Snake Creek T12N R70E S18, Burnt Mill Canyon T13N R69E S6, !Osceola Road T14N R68E S5, Chalk Spring 738 254E 43 57 820N Clifton 47269.

*Erigeron divergens* T. & G. (Plate 143)

DEFUSE FLEABANE. Fairly frequent, below 9000 ft.; often along road, dry openings. May-Sep. \*Wheeler Peak Road T13N R69E S6, !Lehman Creek T13N R69E S12.

*Erigeron flagellaris* A. Gray

TRAILING FLEABANE. Infrequent, 9000-10400 ft.; top of limestone escarpments, rocky limestone slopes. Jul-Aug. †North Fork Big Wash 735 886E 43 08 798N Clifton 44533, \*branch of North Fork Big Wash 735 810E 43 07 680N Clifton 44550.

*Erigeron grandiflorus* Hook. (Plates 144a, b)

ROCKY MOUNTAIN ALPINE FLEABANE. Fairly frequent, 10500-12,000 ft.; open alpine slopes and ridge tops. It is said that this taxon is rhizomatous, however in this area most of the plants are taprooted. Jul-Aug. \*above Williams Canyon T13N R68E S35, !Pyramid Peak T13N R68E S35, Wheeler Peak 731974E 4320724N Clifton 42955. [*E. simplex* Greene].

*Erigeron jonesii* Cronq. (Plates 145a, b)

JONES' FLEABANE. Frequent, 6000-10000 ft.; dry, open rocky places, sometimes open forest floors. The plants at Pine Creek appear to be a strange form of this taxon. May-Sep. Wheeler Peak Campground, Lehman Creek, Mt. Washington Road 732 545E 43 08 949N Clifton 38416, Chalk Spring 738 254E 43 57 820N, \*†Pine Creek 728 048E 43 18 565N Clifton 45628.

*Erigeron leiomerus* A. Gray (Plate 146)

GLABROUS FLEABANE. Fairly frequent, 8900-12000 ft.; rocky places, often cliff crevices, meadow. The plants above Stella Lake have extra broad and long leaves. Jul-Aug. \*Highland Ridge 734 75E 43 06 771N, †above Stella Lake 732 056E 43 20 237N, †Baker Lake 733 400E 43 15 074N Clifton 40986, The Table 742 275E 43 52 576N (NAD 83) Clifton 47173.

*Erigeron nauseosus* (M.E. Jones) A. Nels. (Plate 147)

MARYSVALE FLEABANE. Infrequent, 6000-9400 ft.; crevices, rocky outcrops, and gravelly slopes. These plants are fairly variable in how they look. May-early Jul. \*Wheeler Peak Road T13N R69E S6, †Osceole Road 733 123E 43 33 020N Clifton 44007, †\*Between Jeff Davis Peak and Baker Creek 737 288E 43 18 200N (NAD 83) Clifton 49040.

*Erigeron pumilus* Nutt.

var. *intermedius* Cronq.

INTERMEDIATE SHAGGY FLEABANE. Infrequent, below 7600 ft.; open gravelly to rocky open slope in sagebrush. This taxon is reported for this area. May-Jul.

*Erigeron tener* (A. Gray) A. Gray (Plate 148a, b)

SLENDER FLEABANE. Frequent, 7000-11300 ft.; crevices, rocky slopes, and alpine gravelly ridge tops. Jun-Sep. Pyramid Peak, \*Wheeler Peak Road T13N R69E S6, !Lehman Creek T13N R69E S8, †Big Wash 744 172E 43 08 964N, Head of Smith Creek 736 780E 43 54 674N (NAD 83) Clifton 47146.

*Erigeron uncialis* S. F. Blake

var. *conjugans* S. F. Blake (Plate 149)

NEVADA LONE FLEABANE. Limited, about 9500-9800 ft.; cool side of limestone cliffs. Jul. †Big Springs Wash 738 787E 43 00 444N Clifton 45248.

*Erigeron ursinus* D. C. Eat. (Plates 150a, b, c)

BEAR RIVER FLEABANE. Infrequent, 9000-10950 ft.; small meadows. Jul-Aug. !Stella Lake 39 00 28 114 19 01 Clifton 11797, The Table 742 550E 43 52 5484N Clifton 52128.

## ERIOCARPUM (Group 7)

*Eriocarpum grindelioides* Nutt.

var. *depressa* (Maguire) G. Clifton comb. nov. (Plates 151a, b)

SMALL GUM-WEED ASTER. Limited, 6000-6500 ft.; dry, barren places. These plants used to be in the genus *Machaeranthera*, now they are put in the genus *Xanthisma*, but they are so different that they belong in their own genus where Nuttall put them in the first place. May-early Jul. \*Big Springs Wash T10N R69E S35, †Big Wash 744 172E 43 08 964N.

[*Machaeranthera* g. (Nutt.) Shinn. var. *d.* (Maguire) Cronq. & Keck, *Xanthisma* g. (Nutt.) D. R. Morgan & R. L. Hartm. var. *d.* (Maguire) D. R. Morgan & R. L. Hartm.]

#### GLYPTOPLEURA (Group 1)

*Glyptopleura marginata* D.C. Eat. (Plate 152)

SMALL-FLOWERED HOLLY-DANDELION. Limited. 5000-5500 ft.; sandy places. May-Jun. \*Hamlin Valley T10N R70E S13.

#### GNAPHALIUM (Group 5)

*Gnaphalium macounii* Greene

MACOUN'S CUDWEED. Limited, about 9320 ft.; at the base of large rocks. These plants are strong perennials and don't look like all the plants that have been crammed into this taxon. Mid Jul-Aug. Between Jeff Davis Peak and Baker Creek 737288E 4318200N (NAD 83) Clifton 49039

*Gnaphalium palustre* Nutt. (Plates 153a, b)

LOWLAND CUDWEED. Infrequent, below 9600 ft.; moist places, sandy spots along creeks. Jul-Aug. \*Strawberry Creek T14N R69E S20, !Lehman Creek T13N R69E S12, Lehman Creek 739 414E 43 21 868N, Dead Lake 736 360E 43 12 990N.

#### GRINDELIA Gumweed (Group 3)

*Grindelia squarrosa* (Pursh) Dunal

var. *serrulata* (Rydb.) Steyerl. (Plate 154)

CURLY CUP GUMWEED. Frequent, below 7000 ft.; mostly along roads. Jun-Oct. \*Highway 894 T13N R67E S23, Lehman Creek 741 693E 43 21 375N.

#### GUTIERREZIA (Group 3)

*Gutierrezia sarothrae* (Pursh) Britton. & Rusby (Plates 155a, b)

COMMON SNAKEWEED. Fairly frequent, below 10000 ft., open slopes in sagebrush and other dry open places. Jun-Oct. \*The Cedars T12N R67E S2, Baker Creek 38° 58' 44" 114° 14' 37", !Lehman Creek T13N R69E S12, above Pole Canyon (east) 739 400E 43 14 388N.

#### HELIANTHELLA (Group 3)

*Helianthella uniflora* (Nutt.) T. & G. (Plates 156a, b)

ONE-HEAD or COMMON LITTLE SUNFLOWER. Frequent, 6500-10000 ft.; dry, open places and open forest floors. Jun-Jul. !Baker Creek T13N R69N S30, \*Snake Creek T12N R69E S8, †Head of Pole Canyon 738 315 43 15 110, Miller Basin Wash 732 430E 43 42 580N Clifton 48990.

#### HELIANTHUS Sunflower (Group 3)

1 Plants a strong perennial. . . . . *H. nuttallii*

1 Plants annual

2 Lower cauline leaves often as broad as long, cordate at their base; heads on the large side. . . . . *H. annuus*

2 Lower cauline leaves usually longer than broad, ±acute at their base; heads on the small side. . . . . *H. annuus* var. *aridus*

*Helianthus annuus* L.

a Lower cauline leaves often as broad as long, cordate at their base; heads on the large side. . . . . var. *annuus*

a Lower cauline leaves usually longer than broad, ±acute at their base; heads on the small side. . . . . var. *aridus*

var. *annuus* (Plates 157a, b)

COMMON SUNFLOWER. Widely scattered, below 8500 ft.; along road margins, disturbed places. This plant acts like a weed, but it is native to the w. U.S. and has been cultivated since pre-Columbian times. Jul-Sep. \*Highway 50 T15N R69E S31, Lehman Caves 741 011E 43 20 718N, !Lehman Creek T13N R69E S12.

var. *aridus* (Rydb.) Cockerell

ARID SUNFLOWER. Below 8,500 ft.; lake shores, valley floors, along roads. This variety pass into the last, but often grows exclusively in more native habitats. Jul-Sep. \*Pruess Lake T22S R19W S20.

***Helianthus nuttallii* T. & G.**

NUTTALL'S SUNFLOWER. Limited, about 6320 ft.; margins of wet meadows. Mid Aug-Sep. †Baker Creek 743 399E 43 20 192N.

**HULSEA (Group 3)**

***Hulsea algida* A. Gray (Plates 158a, b)**

PACIFIC ALPINEGOLD. Talus slopes, 10900-11800 ft. Jul-Aug. †Glacier Canyon 733 095E 43 19 048N Clifton 41018.

**HYMENOPAPPUS (Group 6)**

***Hymenopappus filifolius* Hook.**

var. *nanus* (Rydb.) B.L. Turner (Plates 159a, b)

SMALL COLUMBIA CUTLEAF. Infrequent, 5800-9000ft.; dry, barren places. Jun-Jul. South Fork Big Wash 7040 ft. Raymond Jaendl, North Fork Big Wash 742 138E 43 08 689N, †Snake Creek 742 340E 43 10 926N Clifton 49020

**HYMENOXYYS (Group 3)**

**Note:** *H. acaulis* has been put back into the genus *Tetranuris*, however in a few years someone will come along and put it back, so it will be left in this genus.

- 1 Stems lacking leaves..... ***H. acaulis***
- 1 Stems having leaves
  - 2 Leaves subsucculent, essentially glabrous; stems often granular-glandular or glandular-scurfy, sometimes glabrous; moist or wet, alkaline meadows..... ***H. lemmonii***
  - 2 Leaves not succulent, closely canescent to subglabrous; stems closely canescent to subglabrous; dry places as upper valley floors, open slopes and ridges..... ***H. cooperi***

***Hymenoxys acaulis* (Pursh) Parker**

After having collected plants from Wyoming and Colorado this author concludes that there are several un-named taxa within this complex. The plants from here are more like an un-named taxon that is from Mohave County in Arizona that grows at lower elevations than the ones from here.

- a Leaves narrow, not as hairy, darker; flowers different (see photo)..... var. *arizonica*
- a Leaves broader, more hairy; lighter green;..... var. 'serpentina'

var. ***arizonica*** (Greene) Parker (Plates 160a, b)

STEMLESS HYMENOXYYS. Fairly frequent, below 10000 ft.; open rocky slopes. Jun-Jul. !Lehman Creek T13N R69E S7, North Fork Lexington 8320 ft. Raymond Jaendl, †Coyote Canyon 738 360E 43 66 570N Clifton 48927.

var. 'serpentina' (Plates 161a, b)

ROSETTE STEMLESS HYMENOXYYS. Local, 7000-10000 ft.; barren limestone scabland, ridges. May-Mid Aug. †Big Wash 744 172E 43 08 964N, †divide between South Fork Baker Creek and Pole Canyon 737 990E 43 14 818N.

***Hymenoxys cooperi* (A. Gray) Cockerell**

var. *canescens* (D. C. Eat.) K. L. Parker (Plate 162)

RAGGED RUSTLERS. Infrequent, below 8200 ft.; dry open slopes and ridges. In the area of this treatment these plants have been miss identified as *H. richardsonii*. The plants in Spring Valley have the herbage surface granular and the heads are not this taxon. As in the preceding there are a number of un-named taxa. Jun-Aug. \*Burnt Mill Canyon T14N R68E S35, †Spring Valley 720 598E 43 24 172N Clifton 36414.

***Hymenoxys lemmonii* (Greene) Cockerell (Plates 163a, b)**

ALKALI RUBBERWEED. Fairly frequent, below 7000 ft. moist areas about springs, valley bottoms, most often associated with saline soil. Jun-Aug. !Willow Patch Springs T15N R68E S36, \*Big Springs Creek T10N R70E S1, †The Cedars 723 809E 43 12 600N Clifton 40961.

## IVA (Group 6)

*Iva axillaris* L. (Plates 164a, b)

POVERTY WEED. Fairly frequent, below 8500 ft.; along road, lake shores. Jun-Sep. \*Pruess Lake T22S R19W S20, !Lehman Creek T13N R69E S8, Chalk Spring 738 254E 43 57 820N.

## LACTUCA (Group 1)

*Lactuca serriola* L. (Plates 165a, b)

PRICKLY LETTUCE. Infrequent, below 8000 ft.; waste places. May-Oct. \*Highway 894 T13N R67E S23, \*Baker Creek 738 925E 43 18 597N, Lehman Creek 739 414E 43 21 868N.

## LEUCOSYRIS (Group 5)

*Leucosyris carnosa* (A. Gray) Greene

var. *intricata* (A. Gray) Cronq. (Plates 166a, b)

ALKALI-ASTER. Limited, in alkali flats on valley bottoms. This taxon has been and still is being moved from one genus to another. It is very obvious that no one really knows where it belongs, So it is most obviously a monotypic genus. It has no close relationship to any other taxa, even though there are others who try to cram it into other genera. Jul. Spring Valley 720 740E 43 38 110N.

## LYGODESMIA (Group 1)

*Lygodesmia grandiflora* (Nutt.) T. & G.

var. *dianthopsis* (D. C. Eat.) S. L. Welsh (Plate 167)

LARGE-FLOWERED RUSH-PINK. Infrequent, below 7800 ft., dry, open places in juniper or sagebrush, often in sand.. May-Jun. Snake Creek 6600 ft. Ray Jandl, †Snake Creek 747 970 43 11 482.

## MACHAERANTHERA (Group 4)

**Note:** The below plants have been put in the genus *Dieteria*, however until they get the groups of plants straightened out (which they will never do), this author is leaving them in the above expanded genus.

- 1 Inflorescence real stipitate glandular; disk flowers different (see photo). . . . . *M.* 'Valley form'  
 1 Inflorescence not real stipitate glandular; leaves not real spinulose. . . . . *M.* 'Mountain form'

*Machaeranthera canescens* (Pursh) A. Gray

'Mountain form' (Plates 168a, b, c)

MOUNTAIN HOARY ASTER. Frequent, below 10,300 ft.; dry, open places. Jun-Oct. \*Mt Washington Road 733 040E 43 08 693N, !Lehman Creek T13N R69E S8 Clifton 11713. [*Dieteria canescens* (Pursh) Nutt.].

'Valley form' (Plates 169a, b, c)

VALLEY HOARY ASTER. Infrequent, below 7,000 ft.; sandy places. All plants that are olive-green and that have the inflorescence stipitate glandular are included in this taxon, irregardless of leaf and bract shape. Obviously this author doesn't buy the most recent alignment. Jul-Sep. \*†Snake Creek 753 010E 43 12 280N Clifton 48825. [*Dieteria c.* (Pursh) Nutt. var. *l.* (Greene) D. R. Morgan & R. L. Hartm.].

## MALACOTHRIX (Group 1)

- 1 The few cauline leaves auriculate-clasping, if not, than they are entire or slightly runcinate; none of the stems and leaves bearing glandular hairs . . . . . *M. sonchoides*  
 1 The cauline leaves sessile but not sagittate or auriculate; some part of the herbage bearing some glandular hairs. . . . . *M. torreyi*

*Malacothrix sonchoides* (Nutt.) T. & G. (Plates 170a, b)

SOW-THISTLE. These plants are within the range of this area.

*Malacothrix torreyi* A. Gray (Plates 171a, b)

TORREY'S MALACOTHRIX. Fairly frequent, below 6000 ft.; sandy openings in mixed desert shrub. Late Apr-May: Snake Creek T12N R70E S12, \*Hamlin Valley T10N R70E S13, The Troughs Road 727 514E 42 97 522N Clifton 43950.

#### MATRICARIA (Group 6)

*Matricaria discoidea* DC. (Plate 172)

PINEAPPLE WEED. Scattered; road sides and other waste places. Late Mar-Jun. \*Strawberry Creek 734307E 4326630N Clifton 49006. [*Chamomilla suaveolens* (Pursh) Rydb., *Lepidotheca s.* Nutt., *Matricaria matricarioides* (Less.) Porter].

#### MICROSERIS (Group 1)

*Microseris nutans* (Hook.) Schultz-Bip (Plate 173)

NODDING MICROSERIS. Fairly frequent, below 9500 ft.; open woodlands. Jun-Jul. !Burnt Mill Canyon T13N R69E S6, !Baker Creek T13N R69E S30, \*Grub Gulch 728 262E 43 30 614N Clifton 45205, Chalk Spring 738 254E 43 57 820N, †Wheeler Peak Road 738 110E 43 22 760N Clifton 48880.

#### MULGEDIUM (Group 1)

(*Lactuca*)

*Mulgedium oblongifolium* (Nutt.) Reveal (Plate 174)

CHICORY LETTUCE. Infrequent, below 7200 ft.; along banks of streams and ditches. This taxon moves between *Lactuca* and this genus. Jul.-Aug. \*Big Springs Creek T10N R70E S1, Hendrys Creek 750 550E 43 44 020N. [*Lactuca pulchella* (Pursh) DC., *L. tatarica* (L.) C. Meyer ssp. *pulchella* (Pursh) Stebb.].

#### PERITYLE Rock-Daisy (Group 3)(Group

*Perityle stansburyi* (A. Gray) J. F. Macbr. (Plates 175a, b)

STANSBURY'S ROCK-DAISY. Infrequent, below 8800 ft.; limestone soil, cliff crevices, barren areas. Jun-Aug. \*Gray Cliff T13N R69E S22, Baker Creek 742 011E 43 19 221N, \*Standing Snake Pinnacle 7200 Ray Jandl, †Horse Heaven 745 495E 43 14 570N Clifton 45305.

#### PETRADORIA (Group 2)

*Petradoria pumila* (Nutt.) Greene

var. *pumila* (Plate 176)

ROCK GOLDENROD. Frequent, 6000-9600 ft.; dry, open, rocky places, Jun-Aug. \*Red Ledges T9N R69E S8, !Baker Creek Road 741 510E 43 20 026N, †Big Wash 744 172 43 08 964.

#### PICROTHAMNUS (Group 7)

*Picrothamnus desertorum* Nutt. (Plates 177a, b)

BUDSAGE. Widely scattered, below 6600 ft.; valley floors. Apr-Jun. Hamlin Valley T10N R70E S1, !Osceola Road T14N R67E S14. [*Artemisia spinescens* D. C. Eat.].

#### PLEIACANTHUS (Group 1)

(*Lygodesmia*)

*Pleiacanthus spinosus* (Nutt.) Rydb. (Plates 178a, b)

THORNY SKELETON-PLANT. Frequent, below 9000 ft.; Sagebrush slopes and valley floors Jul-Aug. Wheeler Peak Road T13N R69E S6. [*Stephanomeria s.* (Nutt.) S. Tomb, *Lygodesmia s.* Nutt.].

#### PRENANTHELLA (Group 1)

*Prenanthes exiguus* (A. Gray) Tomb (Plate 179)

BRIGHTWHITE. Infrequent, below 6000 ft.; sandy to gravelly soil. This appears to be a range extension ne. Mid Mar-Jun.

\*Gandy Road 758 470E 43 48 370N Clifton 51298. [*Lygodesmia e.* A. Gray]

### PSATHYROTES (Group 5)

*Psathyrotes annua* (Nutt.) A. Gray (Plate 180)

MEALY ROSETTES. Infrequent, below 6500 ft.; openings on sand, gravel or clay, sometimes alkaline soil. May-Oct. \*South Highland Road T11N R67E S34.

### PYRROCOMA (Group 2)

*Pyrrocoma lanceolata* (Hook.) Greene

This group of plants are so variable that it is hard to separate them throughout their range. The following two forms may or may not be real.

a Herbage lacking glandular hairs. . . . . var. *lanceolata*  
 a Herbage glandular or at least glandular hairs are found in the inflorescence. . . . . var. *subviscosa*

var. *lanceolata* (Plates 181a, b)

INTERMOUNTAIN PYRROCOMA. Local, below 6000 ft.: subalkaline herbland. Jul-Aug. \*The Cedars T12N R67E S3.

var. *subviscosa* (Greene) Mayes ex G. Brown & D Keil (Plates 182a, b)

GLANDULAR INTERMOUNTAIN PYRROCOMA. Local, below 6000 ft.: subalkaline herbland. Jul-Aug Spring Valley 718 922 43 38 000 Clifton 45637

### RUDBECKIA (Group 5)

*Rudbeckia occidentalis* Nutt.

WESTERN CONEFLOWER. Infrequent, 5500-8500 ft.; along streams and moist meadows. June-Aug. \*Snake Creek T12N R70E S12.

### SENECIO Butterweed (Group 2)

**Note:** All of the species below except *S. integerrimus* have been put in the genus *Packera* by some, which may be justifiable, however it doesn't seem to enhance our understanding of the plants out in the field. The few cross ? are very sporadic (Plates 185a, b, c)

- 1 Plants rarely over 1 dm tall; involucre purplish. . . . . *S.* 'illustrious'
- 1 Plants usually over 1.5 dm tall; involucre not purplish
- 2 The central head seeming to be sessile on the terminus of the stem with the lateral peduncles longer; phyllaries generally black tipped; roots attached to a button-like root crown . . . . . *S. integerrimus*
- 2 The central head (if present) on a obvious peduncle; phyllaries rarely black tipped; roots otherwise
- 3 Leaves thin, thinly tomentulose. . . . . *S. multilobatus*
- 3 Leaves thick; soon glabrous. . . . . *S. streptanthifolius*

*Senecio* 'illustrious' (Plates 186a, b, c, d)

DISTINGUISHED BUTTERWEED or GROUNDSEL. Infrequent, above 10000 ft.; rocky slopes and in scree. This group of plants have been abused by taxonomists for a long time. These plants have the leaves quit different from the plants that grow in Arizona, California, and Colorado. Most of the collections have no pistillate flowers, so are rayless. Jul-Aug. \*above Stella Lake T13N R68E S11, †Highland Ridge 734 750E 43 06 771N, †North Fork Big Wash 735 140 43 10 739, †Big Wash Peak 738 527E 43 06 899 Clifton 45259, Big Canyon 741 928E 43 51 790 (NAD 83) Clifton 47155. [*S. wernerifolius* A. Gray, misapplied].

*Senecio integerrimus* Nutt.

var. *exaltatus* (Nutt.) Cronq. (Plates 183a, b)

SINGLE-STEM BUTTERWEED. Frequent, 5500-10000 ft.; dry to moist, open or sparsely forested places. May-Jul. Baker Creek 38° 58' 44" 114° 14' 58", !Buck Mountain T13N R68E S1, Chalk Spring 738 254E 43 57 820N.

*Senecio multilobatus* A. Gray (Plates 184a, b)

BASIN BUTTERWEED. Frequent, 5500-10000 ft.; almost every habitat except meadows and wet places. There are plants that

have simple leaves only. May-Jul: \*Snake Creek T12N R69E S8, North Fork Big Wash 743 061E 43 08 336N, †Decathon Canyon 737 435E 43 01 880N Clifton 45243, Chalk Spring 738 254E 43 57 820N.

**Senecio streptanthifolius** Greene (Plates 187a, b)

ROCKY MOUNTAIN BUTTERWEED. Infrequent, 9000-10400 ft.; gravelly slopes in open forest. Jul-Aug. \*North Fork Big Wash 733 897E 43 08 008N Clifton 44556.

### SOLIDAGO Goldenrod (Group 2)

**Note:** After almost 40 years of trying to fit these western plants (*S. canadensis* and *S. velutina* complexes) into the boxes that taxonomists have tried to fit them, this author has come to the conclusion that the present and past delineations are an absolute fraud. *S. lepida* which has been separated from *S. canadensis* (based on overlapping characters) has been separated into two varieties. *S. lepida* var. *lepida*, thyriform arrays, versa *S. lepida* var. *salebroso* having pyramidal paniculiform arrays, however, the latter is the definition of the former (Sample & Cook 2006 FNANM 20: 155). *S. velutina* is said to have a single stem from the ends of the rhizomes (Sample & Cook 2006 FNANM 20: 160), however this author has many sheets of this taxon with a number of stems arising from a branched caudex that is at the end of the rhizome. The plants that are now called *S. lepida* var. *salebroso* are nothing but a minor variant of the northeastern *S. canadensis*. There are many other plants in the western US that bridge the gap between members of *S. canadensis* There are in various places plants that bridge the gap between *S. canadensis* and *S. velutina* complexes, the only difference is that there are often some fine glandular hairs in the inflorescence. **The best way to see the glandular hairs is by holding the floral leaf or involucrel bract on it edge and looking down its face, these can be seen at 20×**

- 1 The petiolate margins of the lower leaves ciliate. . . . . *S. multiradiata*
- 1 The petiolate margins (if present) not ciliate
  - 2 Basal and lowest cauline leaves generally withered by flowering time; most often there are some fine glandular hairs (some times sparse) in the inflorescence. . . . . *S. canadensis*
  - 2 Basal and lowest cauline leaves present at flowering time, if fine glandular hairs present, than inflorescence branches very long and wand-like
    - 3 The upper leaves and floral leaves lacking sparse fine glandular hairs; inflorescence p . . . . . *S. velutina*
    - 3 The upper leaves and floral leaves bearing sparse fine glandular hairs; inflorescence of long wand like erect branches that are leafy. . . . . *S. 'virgula'*

#### *Solidago canadensis* L.

- a Inflorescence branches quite long and leafy. . . . . var. *salebroso*
- a Inflorescence branches short, most often not leafy. . . . . var. *lepida*

var. *salebroso* (Piper) M. E. Jones (Plates 188a, b)

LEAFY CANADA GOLDENROD. Infrequent, below 8000 ft.; along streams and in meadows. Jul-Oct. The plants at Baker Creek have the inflorescence on the large side, the lower branches often not widely spreading or recurved. These that have a large inflorescence show up very sporadic, most of the others have a much smaller inflorescence, even some of them don't have leafy inflorescence branches. Aug-Sep. †Baker Creek 743 570E 43 20 182N, Baker Creek 743328E 4320032N Clifton 47303.

var. *lepida* (DC.) Cronq.

WESTERN GOLDENROD. Infrequent, below 7000 ft.; meadows and stream margins. \*Strawberry Creek T14N R69E S20, !Lehman Creek T13N R69E S8 Clifton 11712.

***Solidago multiradiata*** Ait. (Plates 189a, b)

In the latest works this taxon disappeared from Nevada, they didn't put anything in its place, so the plants that are found in the area of this treatment, even though they grow here, don't exist.

ALPINE GOLDENROD. Frequent, 9000-12000 ft., open alpine turf, along streams in forests. Jul-Aug. Pyramid Peak 733889E 4314424N, Bald Mountain 10,715 ft., \*Lehman Creek T13N R68E S11, †Blue Canyon 733284E 4324176N Clifton 41047.

***Solidago velutina*** DC. (Plates 190a, b, c, d)

MEXICAN GOLDENROD. Fairly frequent, 6000-8400 ft.; gravelly slopes and dry washes. There are plant in the inner coast ranges in California growing on serpentine that are not any more hairy than these plants here, so no varieties are recognized in this treatment. Jul-Sep. \*Lehman Creek T13N R69E S8, †North Fork Big Wash 736527E 4310240N Clifton 43271, Lexington Creek 749 928E 43 04 717N Clifton 52159. [*S. sparsiflora* A. Gray].

***Solidago* 'virgula'** (Plates 191a, b, c)

WAND GOLDENROD. Rare, limited to Lexington Creek, 6000-7000 ft.; riparian. This author has nothing like this anywhere else. End of Jul-Aug. Lexington Creek 749 928E 43 04 717N Clifton 52159.

**SONCHUS** (Group 1)***Sonchus asper*** (L.) Hill (Plates 192a, b)

SPINY LEAF SOW-THISTLE. Infrequent, below 7500 ft.; waste places. May-Aug. \*Snake Creek T12N R70E S18, !Lehman Creek T13N R69E S9.

**SPHAEROMERIA** (Group 6)

- 1 Plants growing in moist alkaline meadows and flats. . . . . ***S. potentilloides***  
 1 Plants growing in cliff crevices and steep rocky slopes. . . . . ***S. diversifolia***

***Sphaeromeria diversifolia*** (D. C. Eat.) Rydb. (Plates 193a, b)

TWO-LEAVED SPHAEROMERIA. Widely scattered, 6500-10500 ft.; cliffs and steep rocky slopes, most often on limestone. Jul-Sep. \*branch of Lincoln Canyon T12N R68E S26, †Snake Creek 741 496E 43 11 300N, †Horse Heaven 745 495E 43 14 570N Clifton 45304, South Fork Big Wash 737 5309E 43 05 922N.

***Sphaeromeria potentilloides*** (A. Gray) Heller

var. ***nitrophila*** (Cronq.) A. H. Holmgren, L. M. Shultz & Lowrey (Plates 194a, b)

SMALL CINQUEFOIL TANSY. Below 5600 ft; alkali meadows. This taxon is quite different from *Sphaeromeria* in that the receptacle is white-hairy and the seeds swell and become sticky when wet. Jun-early Aug. \*Hamlin Valley T10N R70E S12, †Highway 50 722 842E 4336 232N Clifton 44013.

**STENOTUS** (Group 2)

(Haplopappus in part)

***Stenotus acaulis*** Nutt.

var. ***glabratus*** (H. M. Hall) Kartesz & Gandhi (Plate 195)

CUSHION STENOTUS. Fairly frequent, below 11000 ft.; dry, open, often quite rocky places. Some don't recognize the variety, however it is the only one that grows in this range. The leaves are varnished on the upper surface and well up the stem. It is as much different as the variety *depressa* of *Eriocarpum grindelioides*. May-early Aug. \*head of Lincoln Canyon T12N R68E S14, !Baker Creek Road 741 510E 43 20 026N, Chalk Spring 738 254E 43 57 820N. [*Haplopappus a.* (Nutt.) A. Gray].

**STEPHANOMERIA** (Group 1)***Stephanomeria exigua*** Nutt. (Plate 196)

SMALL WIRE-LETTUCE. Fairly frequent, below 7000 ft.; May-Oct. !Highway 488 T13N R69E S12, !Lehman Creek Clifton 11726.

**TARAXACUM** Dandelion (Group 1)

- 1 The inner phyllaries often broaden at the apex, outer bracts not reflexed. . . . . ***T. ceratophorum***  
 1 The inner phyllaries acute at the apex, outer reflexed. . . . . ***T. officinale***

***Taraxacum ceratophorum*** (Ledeb.) DC. (Plate 197)

NORTHERN DANDELION. Fairly frequent, 10500-12000 ft.; crevices in rock, alpine meadows, rocky, moist slopes. Jun-Aug. \*Wheeler Peak T13N R68E S14, †Highland Ridge 734 750E 43 06 771N, The Table 742 249E 43 51 786 (NAD 83) Clifton 47158.

***Taraxacum officinale*** Wigg. (Plate 198)

COMMON DANDELION. Frequent, rarely above 8000 ft.; pastures, meadows, waste places; introduced from Eurasia. Apr-Nov. Lehman Creek T13N R69E S8, \*Baker Creek 738 660E 43 17 510N Clifton 48838

**TETRADYMIA** Horsebush (Group 5, 7)

- 1 Plants having thorns that persist
  - 2 Branchlets tomentose; achene hairs almost as long as the pappus bristles. . . . . *T. spinosa*
  - 2 Branchlets pubescent to ± glabrous; achene hairs much shorter. . . . . *T. nuttallii*
- 1 Plants lacking thorns
  - 3 Plants canescent. . . . . *T. canescens*
  - 3 Plants glabrate. . . . . *T. glabrata*

***Tetradymia canescens*** DC. (Plates 199a, b)

GRAY HORSE-BRUSH. Scattered, below 9000 ft.; dry open slopes in sagebrush. Jun-Aug. !Lehman Creek T13N R69E S8 Clifton 11716, Baker Creek 38° 58' 44" 114° 15' 03", \* Snake Creek 745225E 4310694N.

***Tetradymia glabrata*** T. & G. (Plates 200a, b)

LITTLE-LEAF HORSE-BRUSH. Infrequent, below 7,000 ft.; canyons and slopes. May-Jul. \*Coyote Canyon 741 600E 4 36 8080N Clifton 48938, Snake Creek 753 532E 43 12 282N Clifton 42877.

***Tetradymia nuttallii*** T. & G. (Plates 201a, b)

NUTTALL'S HORSE-BRUSH. Fairly frequent, below 6,400 ft; open slopes and flats among other shrubs. May-early Jun. Baker Creek 743 304E 43 20 206N, \*Cross Road T13N R70E S5, †Snake Creek 753 920E 43 11 857N Clifton 43993.

***Tetradymia spinosa*** H. & A. (Plates 202a, b)

SPINY HORSE-BRUSH. Infrequent, below 6,500 ft.; valley floors. Apr-Jun. \*Cross Road T13N R70E S5.

**TOWNSENDIA** (Group 3)

- 1 Flowers quite elevated above the lower leaves, cauline leaves only slightly reduced. . . . . *T. florifera*
- 1 Flowers not or only slightly elevated above the lower leaves, cauline leaves not obvious
  - 2 Heads on well developed stems; plants not forming dense mats. . . . . *T. scapigera*
  - 2 Heads sessile; plants forming small mats. . . . . *T. jonesii*

***Townsendia florifera*** (Hook.) A. Gray (Plates 203a, b, c)

SHOWY TOWNSEND-DAISY. Infrequent, below 7,000 ft.; gravelly or sandy slopes. May-Jun. \*Cross Road T13N R70E S5, †Branch of Hyde Wash 742 415E 42 80 995N Clifton 43887, †Spring Valley 724 705E 42 96 593N Clifton 51272.

***Townsendia jonesii*** (Beaman) Reveal (Plates 204a, b, c)

JONES' TOWNSEND-DAISY. below 9100 ft.; slopes, flats, and washes. May-Jul. Lehman Creek Ridge 7000 ft. Ray Jaindl., \*Murphy Wash T10N R68E S15, head of Coyote Canyon 734 510E 43 67 075N Clifton 51313.

***Townsendia scapigera*** D.C. Eat.

GROUND TOWNSEND-DAISY. Infrequent, below 10000 ft.; dry, open places. May-Jul. \*Spring Valley T11N R68E S18.

**TRAGOPOGON** (Group 1)***Tragopogon dubius*** Scop. (Plate 205)

YELLOW SALSIFY. Fairly frequent, below 9500 ft.; disturbed places, sometimes in native habitat. May-Aug. !Lehman Creek T13N R69E S8, Chalk Spring 738 254E 43 57 820N.

**TRIMORPHA** (Group 4)

**Note:** These plants have now been stuck back into *Erigeron*

***Trimorpha lonchophylla*** (Hook.) G. Nesom (Plates 206a, b)

SHORT-RAYED DAISY. Below 8,500 ft.; moist or wet meadows. Jun-Sep. \*The Cedars 723 805E 43 12 692N Clifton 40957, Baker Creek T13N R69E S14, †Snake Creek 746 052E 43 10 600N Clifton 41061. [*Erigeron l.* Hook].

**TRIPLEUROSPERMUM** (Group 3)***Tripleurospermum inodorum*** (L.) Sch.-Bip. (Plates 207a, b)

FALSE-CHAMOMILE. Limited; waste places; introduced from Europe. Jun-Sep. \*Baker Creek 738 756E 43 17 586N.

[*Matricaria maritima* L. var. *I.* (L.) Soó]

**WYETHIA** (Group 3)

***Wyethia amplexicaulis*** (Nutt.) Nutt. (Plate 208)

MULE'S EARS. Fairly frequent, 6500-8500 ft.; open places that dry late. May-Jun. \* Strawberry Creek 733 223E 43 26 119N Clifton 45661, Baker Creek 738 642E 43 18 196N.

**XANTHIUM** (Group 6, 7)

***Xanthium strumarium*** L. (Plates 209a, b)

COCKLEBUR. Locally frequent, below 6000 ft.; lake shores and other drying places. Jun-Oct. Hamlin Valley T10N R70E S12, \*Pruess Lake T22S R19W S20, !Lehman Creek T13N R69E S12 Clifton 11729. [var. *canadense* (Mill.) T. & G.].

Plates 65-70a



Plate 65 *Achillea millefolium* var. *alpicola*



Plate 66 *Achillea millefolium* var. *lanulosa*



Plate 67 *Acroptilon repens*



Plate 68 *Agoseris aurantiaca* var. *purpurea*



Plate 69b



Plate 69a *Agoseris glauca* var. *laciniata*



Plate 70a *Amauriopsis dissecta*

Plates 70b-76b



Plate 70b



Plate 71 *Antennaria corymbosa*



Plate 73 *Ambrosia acanthicarpa*



Plate 72a *Antennaria media*



Plate 72b



Plate 74a *Antennaria microphylla*



Plate 74b



Plate 75a *Antennaria parvifolia*



Plate 75b



Plate 76a *Antennaria umbrinella*



Plate 76b

Plates 74c, d; 76a-81b



Plate 74c



Plate 74d



Plate 77a *Arctium minus*



Plate 77b



Plate 78a *Arnica longifolia*



Plate 79 *Arnica chamissonis*



Plate 80a *Arnica cordifolia*



Plate 78b



Plate 81b



Plate 80b



Plate 81a *Arnica mollis*

Plates 82a-87a

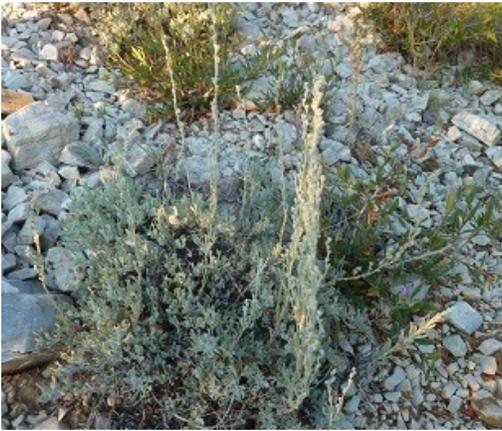


Plate 82a *Artemisia arbuscula*



Plate 82b



Plate 83a *Artemisia biennis*



Plate 83b

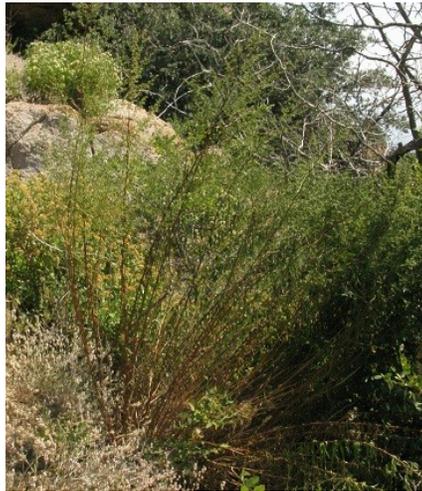


Plate 84a *Artemisia dracunculoides*



Plate 84b

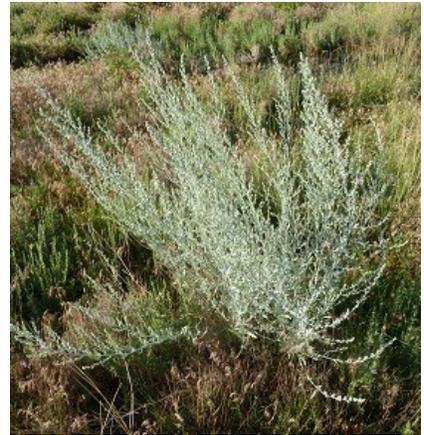


Plate 86a *Artemisia ludoviciana*  
var. *albula*



Plate 85a *Artemisia frigida*



Plate 85b



Plate 86b

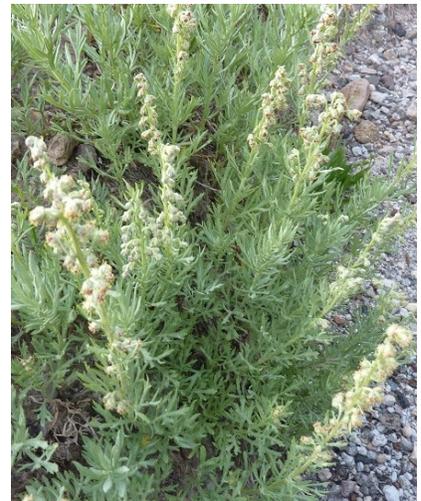


Plate 87a *Artemisia ludoviciana*  
var. *incompta*

Plates 87b-92



Plate 87b



Plate 88a *Artemisia michauxiana*



Plate 88b



Plate 89a *Artemisia nova*



Plate 89b



Plate 90b



Plate 90a *Artemisia pygmaea*



Plate 91a *Artemisia tridentata*



Plate 92 *Artemisia tridentata* var. *vaseyana*



Plate 91b

Plates 93a-99b



Plate 93a *Aster 'accedens'*



Plate 93b



Plate 94a *Aster eatonii*



Plate 94b



Plate 94c



Plate 95 *Aster foliaceus* var. *apricus*



Plate 96 *Aster frondosus*



Plate 97 *Aster 'variabilis'*



Plate 98a *Balsamorhiza hookeri* var. *hispidula*



Plate 98b



Plate 99a *Balsamorhiza sagittata*



Plate 99b

**Plates 100-106**



**Plate 100** *Balsamorhiza X terebinthacea*



**Plate 101** *Bidens cernua*



**Plate 103b**



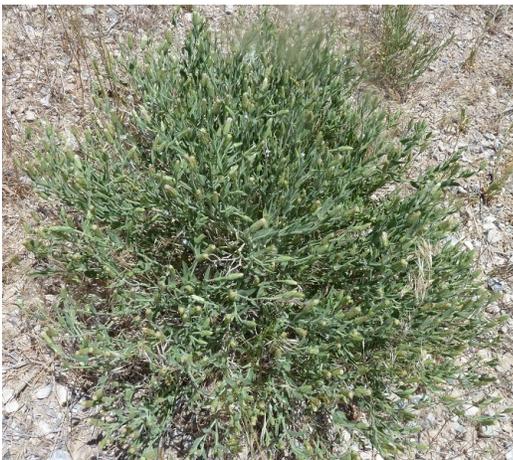
**Plate 102** *Brickellia californica*



**Plate 103a** *Brickellia microphylla*



**Plate 104b**



**Plate 104a** *Brickellia oblongifolia*



**Plate 105a** *Carduus nutans*



**Plate 106** *Centaurea micranthos*



**Plate 105b**

Plates 107a-111b



Plate 107a *Chaenactis douglasii*



Plate 107b



Plate 107c



Plate 108a *Chaenactis macrantha*



Plate 108b



Plate 111b



Plate 109 *Chaenactis stevioides*



Plate 110 *Chaetopappa ericoides*



Plate 111a *Chrysopsis villosa* var. *scabra*

Plates 112a-117a



Plate 112a *Chrysothamnus albidus*



Plate 113a *Chrysothamnus greenei*



Plate 113b



Plate 112b



Plate 114b



Plate 114a *Chrysothamnus nauseosus* var. *leiospermus*



Plate 116 *Chrysothamnus parryi*



Plate 115 *Chrysothamnus nauseosus* var. *oreophilus*



Plate 117a *Chrysothamnus viscidiflorus*

Plates 117a-121c



Plate 117b



Plate 117c



Plate 118 *Cirsium arizonicum*



Plate 119a *Cirsium arvense*



Plate 119b



Plate 120 *Ciraium eatonii* var. *viperinum*



Plate 121b



Plate 121a *Cirsium inamoenum*



Plate 121c

Plates 122a-123f



Plate 122a *Cirsium neomexicanum*



Plate 122b



Plate 123a *Cirsium* 'intermountanum'



Plate 123b



Plate 123c



Plate 123d



Plate 123e



Plate 123f

Plates 124a-128a



Plate 124a *Cirsium* 'spinescens'



Plate 124b



Plate 125a *Cirsium* 'alcalinum'



Plate 125b



Plate 126a *Cirsium vulgare*



Plate 126b



Plate 127a *Crepis acuminata*



Plate 127b



Plate 128a *Crepis atribarba*

Plates 128b-132a



Plate 128b



Plate 129a *Crepis intermedia*



Plate 130a *Conyza canadensis*

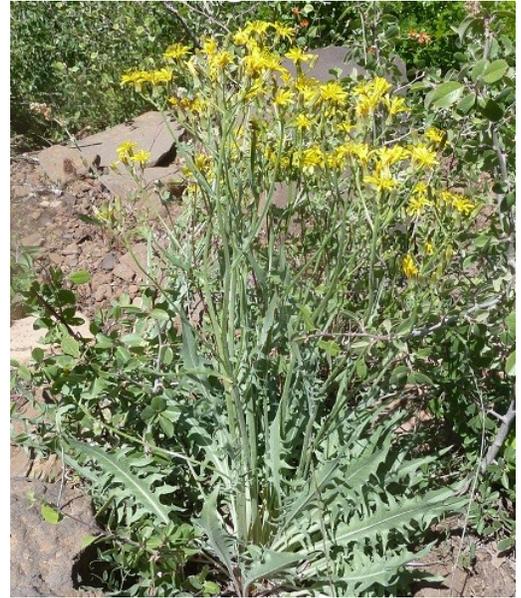


Plate 129b



Plate 131b



Plate 131a *Crepis modocensis*



Plate 131c



Plate 132a *Crepis nana*

Plates 132b-136b



Plate 132b



Plate 133a *Crepis occidentalis* var. *pumila*



Plate 133b



Plate 133c



Plate 134a *Crepis runcinata* var. *glauca*



Plate 134b



Plate 135a *Enceliopsis nudicaulis*



Plate 135b



Plate 136a



Plate 136b *Ericameria discoidea*

Plates 137-141



Plate 137 *Ericameria nana*



Plate 138a *Erigeron aphanactis*



Plate 139 *Ericameria watsonii*



Plate 138b



Plate 140 *Erigeron argenteus*



Plate 141 *Erigeron compactus*

Plates 142-148a



Plate 142 *Erigeron concinnus*



Plate 143 *Erigeron divergens*



Plate 144a *Erigeron grandiflo-*



Plate 144b



Plate 145a *Erigeron jonesii*



Plate 145b



Plate 146 *Erigeron leiomerus*



Plate 147 *Erigeron nauseosus*



Plate 148a *Erigeron tener*

Plates 148b-153b



Plate 148b



Plate 149 *Erigeron uncialis* var. *conjugans*



Plate 150b



Plate 150a *Erigeron ursinus*



Plate 150c



Plate 151b



Plate 151a *Eriocarpum grindelioides* var. *depressa*



Plate 152 *Glyptopleura marginata*



Plate 153a *Gnaphalium palustre*



Plate 153b

Plates 154-159a



Plate 154 *Grindelia squarrosa* var. *serrulata*



Plate 155a *Gutierrezia sarothrae*



Plate 155b



Plate 156b



Plate 157b



Plate 156a *Helianthella uniflora*



Plate 157a *Helianthus annuus*



Plate 158b *Hulsea algida*



Plate 159a *Hymenopappus filifolius* var. *nanus*



Plate 158b

Plates 159b-164b



Plate 159b



Plate 160a *Hymenoxys acaulis*  
var. *arizonica*



Plate 160b



Plate 161a *Hymenoxys* 'serpentina'



Plate 162a *Hymenoxys lemmonii*



Plate 161b



Plate 163a *Hymenoxys cooperi*



Plate 162b



Plate 164b



Plate 164a *Iva axillaris*

Plates 165a-169c



Plate 165a *Lactuca serriola*



Plate 165b



Plate 166a *Leucosyris carnosa* var. *intricata*



Plate 168b



Plate 167 *Lygodesmia grandiflora* var. *dianthopsis*



Plate 166b



Plate 168a *Machaeranthera canescens* mountain form



Plate 168c



Plate 169a, b *Machaeranthera canescens* (valley form)



Plate 169c

Plates 170a-175a



Plate 170a *Malacothrix sonchoides*



Plate 169b



Plate 171a *Malacothrix torreyi*



Plate 172 *Matricaria discoidea*



Plate 171b



Plate 173 *Microseris nutans*



Plate 174 *Mulgedium oblongifolium*



Plate 175a *Perityle stansburyi*

Plates 175b-181a



Plate 175b



Plate 176 *Petradoria pumila*



Plate 177a *Picrothamnus desertorum*



Plate 177b



Plate 178b



Plate 178a *Pleiacanthus spinosus*



Plate 180 *Psathyrotes annua*



Plate 179 *Prenanthes exigua*



Plate 181a *Pyrrcoma lanceolata*

Plates 181b-185a



Plate 181b



Plate 182a *Pyrrcoma lanceolata* var. *subviscosa*



Plate 182b



Plate 183a *Senecio integerrimus* var. *exaltatus*



Plate 183b



Plate 184a *Senecio multilobatus*



Plate 184b

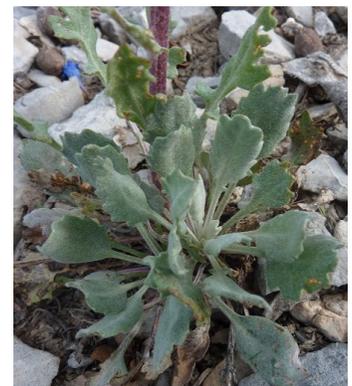


Plate 185a *Senecio* cross?

Plates 185b-188b



Plate 185b



Plate 186a *Senecio* 'illustrious'



Plate 187a *Senecio streptanthifolius*



Plate 186b



Plate 187b



Plate 185c



Plate 186c



Plate 189a *Solidago multiradiata*



Plate 189b



Plate 188a *Solidago canadensis*  
var. *salebrosa*



Plate 188b

Plates 190a-191b



Plate 190a *Solidago velutina*



Plate 190b



Plate 190c



Plate 190d



Plate 191a *Solidago* 'virgule'



Plate 191b

Plates 191c-195



Plate 191c



Plate 192a *Sphaeromeria diversifolia*



Plate 192b



Plate 193b



Plate 194b



Plate 193a *Sonchus asper*



Plate 194a *Sphaeromeria potentilloides* var. *nitrophila*



Plate 195 *Stenotus acaulis* var. *glabrata*

Plates 196-201b



Plate 196 *Stephanomeria exigua*



Plate 197 *Taraxacum ceratophorum*



Plate 198 *Taraxacum officinale*



Plate 199a *Tetradyimia canescens*



Plate 199b



Plate 200b



Plate 200a *Tetradyimia glabrata*



Plate 201a *Tetradyimia nuttallii*



Plate 201b

Plates 202a-204c



Plate 202a *Tetradymia spinosa*



Plate 202b



Plate 203a *Townsendia florifera*



Plate 203b



Plate 203c



Plate 204b



Plate 204a *Townsendia jonesii*



Plate 204c

Plates 205-208



Plate 205 *Tragopodon dubius*



Plate 206a *Trimorpha lonchophylla*



Plate 206b



Plate 207a *Tripleurospermum inodorum*



Plate 207b



Plate 208 *Wyethia amplexicaulis*

Plates 209a-211b



Plate 209a *Xanthium strumarium*



Plate 209b



Plate 210 *Erigeron composites* var. *discoideus*



Plate 211a *Erigeron composites* var. *glabratus*



Plate 211b

**BERBERIDACEAE** Barberry Family

**Note:** The statements that have been made about these plants, are not consistent, the plants themselves seem to refute these statements. *Berberis fendleri* doesn't fit within the statements as it doesn't have axillary shoots, they are nothing but a fascicle of leaves in the axils of the stem. However, if it makes people happy to make them all *Berberis* so be it. Real *Berberis* has spines at the nodes and simple leaves. The below plants move from one to the other depending on who is doing this group, so here they will be left at specific rank.

**MAHONIA** Barberry

- 1 Plants a very tall bush; leaves narrow with very spiny lobes. . . . . *M. fremontii*  
 1 Plants a very low bush; leaves broader, not lobed. . . . . *M. repens*

***Mahonia repens*** (Lindl.) G. Don (Plates 228a, b)

DWARF or CREEPING BARBERRY. Frequent, 6000-10000 ft.; open forest floors, pinyon-juniper slopes and flats. Mar-Jun. !Wheeler Peak Campground T13N R68E S11, North Fork Big Wash 742 138E 43 08 689N, Chalk Spring 738 254E 43 57 820N, \*Baker Creek 738532E 4317295 Clifton 48841. (*Berberis r.* Lindl.).

***Mahonia fremontii*** (Torr.) Fedde (Plate 229)

FREMONT'S BARBERRY. Limited, about 6840 ft.; mountain wash. There was only one very large bush. This apparently is the most northern extent of this taxon. May. \*Murphy Wash T10N R68E S11. [*Berberis f.* Torr.].

**BETULACEAE** Birch Family**BETULA**

***Betula occidentalis*** Hook. (Plate 230)

WESTERN PAPER BIRCH. Frequent, below 9,000 ft.; along stream. Apr-May. Baker Creek T13N R69E S14, !Lehman Creek T13N R69E S8.

**BORAGINACEAE** Borage Family

- 1 Nutlets glochidiate-prickly  
 2 Flowers dull reddish-purple; nutlets with the prickles uniformly on the whole surface. . . . . *Cynoglossum*  
 2 Flowers blue or white  
 3 Corolla inconspicuous 1.5-2.5 mm wide, lobes ± erect. . . . . *Lappula*  
 3 Corolla conspicuous 4-11 mm wide, lobes spreading. . . . . *Hackelia*  
 1 Nutlets unarmed  
 4 Flowers wholly yellow or greenish-yellow  
 5 Annuals. . . . . *Amsinckia*  
 5 Perennials  
 6 Inflorescence leafy. . . . . *Lithospermum*  
 6 Inflorescence not leafy. . . . . *Oreocarya*  
 4 Flowers mostly white, pink, lavender or blue  
 7 Flowers blue, pink or lavender  
 8 Plants erect, montane. . . . . *Mertensia*  
 8 Plants prostrate, low desert. . . . . *Tiquilia*  
 7 Flowers white (sometimes with a yellow eye)  
 9 Biannual to perennial. . . . . *Oreocarya*  
 9 Annuals  
 10 Plants growing in moist places; nutlets with a well developed ventral keel. . . . . *Allocarya*  
 10 Plants growing in dry places; nutlets with a closed or narrowly open ventral groove-scar. . . . . *Cryptantha*

**ALLOCARYA**

**Note:** This genus is being maintained because the fruits have a different point of attachment and most of the plants grow in wetter

type habitats than the genus *Plagiobothrys*.

- 1 Stem and leaf hairs spreading; corolla 2-3 mm across. . . . . *A. salsus*
- 1 Stem and leaf hairs appressed or essentially lacking; corolla less than 2 mm across
  - 2 Stem and leaf hairs appressed; plants decumbent to prostrate
    - 3 Nutlets ± shinny and glabrous. . . . . *A. cusickii*
    - 3 Nutlets dull and appearing hairy. . . . . *A. hispidula*
  - 2 Stem and leaf hairs essentially lacking; plants erect. . . . . *A. 'intermontana'*

***Allocarya cusickii*** Greene (Plates 231a, b, c)

CUSICK'S ALLOCARYA. Local, below 8,000 ft.; vernal wet places. Mid May-Jul. †Shoshone Ponds 723 496E 43 12 590N Clifton 43922, \*Lake Creek 760029E 4306700N Clifton 49028. [*Plagiobothrys c.* (Greene) I. M. Johnst.].

***Allocarya hispidula*** Greene (Plates 231a, b, c)

HARSH POPCORN FLOWER. Limited about 8000 ft.; small vernal moist depressions. Jun-early Jul. Wheeler Peak Road 738110E 4322760N Clifton 48868. [*Plagiobothrys h.* (Greene) I. M. Johnston, *P. scouleri* (H. & A.) I. M. Johnst. var. *pedicellatus* (Greene) Cronq., in part].

***Allocarya* 'intermontana'**

INTERMOUNTAIN ALLOCARYA. Limited, about 5554 ft.; large vernal pond. There are plants from Oasis Valley in Nye County that are quite similar. "Jun-early Jul. north of North Millick Spring 725220E 4356050 (NAD 83) Clifton 47191.

***Allocarya salsus*** Brandeg. (Plate 233)

SALTY ALLOCARYA. Fairly frequent, below 5900 ft.; vernal moist depressions. Jun-Jul. †Shoshone Ponds 723 408 43 12 357 Clifton 45640, north of North Millick Spring 725220E 4356050 (NAD 83) Clifton 47188. [*Plagiobothrys salsus* (Brandege) I. M. Johnst.].

### AMSINCKIA Fiddleneck

- 1 Sepals all or all most free to the base, 5. . . . . *A. intermedia*
- 1 Sepals with some fused, appearing to be 4. . . . . *A. tessellata*

***Amsinckia intermedia*** Fisch & Mey. (Plate 234)

INTERMEDIATE FIDDLENECK. below 6,500 ft. These plants were observed above upper Lehman Creek Campground along the road many years ago. When found again the plants may turn out to be *A. menziesii* as it is more common in this part of Nevada than *A. intermedia*. Apr-Jun.

***Amsinckia tessellata*** A. Gray (Plates 235a, b)

TESSELLATE or CHECKER FIDDLENECK. These plants are well within the range of this treatment. below 6,500 ft. Apr-Jun.

### CRYPTANTHA

**Note:** In this group of plants you need very mature nutlets to separate the taxa

- 1 Plants mostly spreading; calyx circumscissile, basal part scarious, upper the same texture as rest of the plant . . . . . *C. circumscissa*
- 1 Plants generally more erect; calyx not circumscissile
  - 2 Nutlets with 3 broadly, crenulate wings. . . . . *C. pterocarya*
  - 2 Nutlets not broadly winged
    - 3 Nutlets smooth (you may need to look at a number of plants within a population to see what the nutlets are like)
      - 4 The nutlets generally 1, rarely 2, or 3 in some of the flowers; calyx lacking coarse hispid hairs. . . . . *C. gracilis*
      - 4 The nutlets generally 4, rarely 3 or 3 in some of the flowers; calyx usually bearing some coarse hispid hairs
        - 5 The nutlets sharp-edged, markedly so towards the tip. . . . . *C. watsonii*
        - 5 The nutlets rounded on the margins. . . . . *C. torreyi*
    - 3 Nutlets roughened
      - 6 Fruiting calyx strongly spreading and ± recurved because the perfect nutlet is curved. . . . . *C. recurvata*
      - 6 Fruiting calyx and nutlet not as above
        - 7 Nutlets tuberculate, sometimes hardly so
          - 8 The large hispid hair on the calyx not dominate; the central axis generally is well developed . . . . . *C. barbiger*
          - 8 The large hispid hairs on the calyx are more dominate; the central axis is lacking on well developed plants

- ..... *C. ambigua*  
 7 Nutlets ± densely spiculate-papillate..... *C. echinella*

***Cryptantha ambigua*** (A. Gray) Greene (Plates 236a, b)

WILKES' CRYPTANTHA. Infrequent, below 8600 ft.; dry sandy or gravelly slopes and flats. Some of the nutlets appear smooth., thus appearing like *C. torreyana* Jun-Jul. †\*North Branch Rye Grass Canyon 736700E 4362390N Clifton 48916, Kious Basin 744 850E 43 17 065N Clifton 51337.

***Cryptantha barbigera*** (A. Gray) Greene (Plates 237a, b, c)

BEARDED CRYPTANTHA. Infrequent, below 6500 ft.; sandy or rocky soil. May. \*Cross Road T13N R70E S5.

***Cryptantha circumscissa*** (H. & A.) Johnston (Plate 238)

CUSHION CRYPTANTHA. Infrequent, below 7500 ft.; open sandy places. May-Jul.

***Cryptantha echinella*** Greene

PRICKLY CRYPTANTHA. Infrequent, 5400-8500 ft.; rocky slopes. These plants are at a lower elevation than they should be, but they look like this taxon in almost all respects. Jun-Aug. †Pruess Lake 759 550E 43 06 317N Clifton 43989.  
 †Red Ledges 736 438E 4283 033N Clifton 43981.

***Cryptantha gracilis*** Osterhout (Plates 239a, b, c)

NARROW-STEMMED CRYPTANTHA. Fairly frequent, 5500-7000 ft.; gravelly to rocky slopes. May-Jun. The Trough's Road 727 514E 42 97 522N Clifton 43952, Marble Canyon 744 038E 43 70 885N Clifton 51307.

***Cryptantha pterocarya*** (Torr.) Greene (Plates 240a, b)

WING-NUT CRYPTANTHA. Frequent, below 6500 ft.; sandy to gravelly places in mixed desert shrub and pinyon-juniper. Mid Apr-May. Snake Valley T13N R70E S5.

***Cryptantha recurvata*** Cov. (Plate 242)

CURVE-NUT CRYPTANTHA. Infrequent, 5500-6100 ft.; sandy to gravelly slopes and valley bottoms. Mid Apr-Jun. The Trough's Road 727 514E 42 97 522N Clifton 43951.

***Cryptantha torreyana*** (A. Gray) Greene (Plates 241a, b)

TORREY'S CRYPTANTHA. Fairly frequent, below 8000 ft.; open woodland. May-Jun. \*Mill Creek T13N R69N S6, \*Gray Cliffs 740 768E 43 19 080N Clifton 51329.

***Cryptantha watsonii*** (A. Gray) Greene (Plate 243)

WATSON'S CRYPTANTHA. Fairly frequent, below 9800 ft.; on slopes and flats in the open or in the shade. May-Jul. \*Spring Valley T12N R67E S10, Big Springs Wash T9N R69E S2., Decathon Canyon 737 330E 43 00 211E Clifton 45233, Marble Wash 743540E 4370136N Clifton 48945.

## CYNOGLOSSUM

***Cynoglossum officinale*** L. (Plates 244a, b, c)

COMMON HOUND'S TONGUE. Limited, about 6650 ft.; in shrubs in an meadow, introduced from Eurasia. May-early Jul.  
 \*Strawberry Creek T14N R69E S20, †Snake Creek 743554E 4311160N Clifton 48833.

## HACKELIA

- 1 Corolla white..... *H. patens*  
 1 Corolla blue  
 2 Stems 1-3 from the base, caudex lacking; each raceme longer, more flowered; style not reaching the stamens  
 ..... *H. floribunda*  
 2 Stems often more than 3 from the base, caudex branching; each raceme few flowered; style usually reaching  
 the stamens..... *H. micrantha*

***Hackelia floribunda*** (Lehm.) I. M. Johnst. (Plates 245a, b)

MANY-FLOWERED STICKSEED. Limited, below 9000 ft.; dry margins of meadows. Jun-Sep. \*Baker Creek 739740E 4319290N Clifton 49031.

***Hackelia micrantha*** (Eastw.) J. L. Gentry (Plates 246a, b)

SMALL-FLOWERED STICKSEED. 6800-10000 ft.; moist places, meadows, forest openings. known from the n. Snake Range.

***Hackelia patens*** (Nutt.) I. M. Johnst. (Plates 247a, b)

PALE-FLOWERED STICKSEED. Frequent, below 10000 ft.; openings in sagebrush on slopes and flats. Jun-Jul. \*Snake Creek T12N R69E S6, !Buck Mountain T13N R68E S1, North Fork Big Wash 742 138E 43 08 689N, Chalk Spring 738 254E 43 57 820N.

## LAPPULA

**Note:** Variety *cupulata* represents the nutlets that have a fully inflated margin with very small prickles (also called *L. texana* by some). Most floras have combined this and var. *desertorum* because they don't think they are different. Var. *cupulata* (A. Gray) M. E. Jones (Plate 258) has to be used if they are combined because it has priority. Since the nutlets are used to separate the taxa, than if you combine the two markedly different nutlets, you would also have to combine the nutlets of the species itself, because it is just as much different as the varieties. Variety *cupulata* is included in the key as it may grow in the area of this treatment.

*Lappula redowskii* (Hornem.) Greene

- a Marginal prickles of the nutlets attached to a semi to fully inflated edge  
 b The edge semi inflated, the prickles well developed. . . . . var. *desertorum*  
 b The edge fully inflated, the prickles poorly developed. . . . . var. *cupulata*  
 a Marginal prickles of the nutlets attached on almost a knife-like edge. . . . . var. *redowskii*

var. *desertorum* I. M. Johnst. (Plate 249)

THICK-MARGINED ANNUAL STICKSEED. Widely scattered, below 8000 ft.; over grazed land, roadsides, and other waste places. May-Jul. \*The Cedars T13N R67E S34, \*Coyote Canyon 742400E 4369655N Clifton 48941.

var. *redowskii* (Plates 250a, b)

WESTERN ANNUAL STICKSEED. Fairly frequent, below 8500 ft.; over grazed land, roadsides, sometimes in openings in sagebrush. May-Jul. \*Highway 894 T13N R67E S15, !Burnt Mill Canyon T13N R69E S6, Chalk Spring 738 254E 43 57 820N. [*L. occidentalis* Greene].

## LITHOSPERMUM

- 1 Corolla yellow, tube 15-35 mm long. . . . . *L. incisum*  
 1 Corolla yellow-green, tube 4-12 mm long. . . . . *L. ruderale*

*Lithospermum incisum* Lehm. (Plates 251a, b)

SHOWY STONESEED. Infrequent, below 8800 ft.; desert scrub, sometimes subalkaline soil. Spring Valley T13N R67E S33, \*Lexington Creek 6800 ft. Raymond Jandl., †Snake Creek 742624E 4311056N Clifton 49022.

*Lithospermum ruderale* Lehm. (Plate 252)

WESTERN GROMWELL OR STONESEED. Frequent, 6200-9000 ft.; open sagebrush slopes. May-Jun. Lexington Creek 8200 ft. Raymond Jandl, †Baker Creek 738 939 43 18 237.

## MERTENSIA Bluebells

**Note:** The tall group crosses with the short group, often appearing to create populations of plants that have characters of both. The plants called *Mertensia glauca* were growing with *Mertensia franciscana*. They also differ in that the sepals are as long or a little longer than the corolla tube, whereas the other two have them shorter than the tube. (Plates 255a, b)

- 1 Sepals essentially glabrous (short group). . . . . *M. oblongifolia*  
 1 Sepals bearing hairs on the margins of the lobes or on the margins and across the back (tall group)  
 2 Plants fewer stemmed, more open; leaves lacking strigose hairs on the upper surface. . . . . *M. ciliata*  
 2 Plants bearing more stems which make them look like they in large tufts; the upper surface have strigose hairs  
 . . . . . *M. franciscana*

*Mertensia ciliata* A. Heller. (Plates 253a, b, c)

VARIABLE BLUEBELLS. Rare? 7,000-10,500 ft.; mesic slopes, riparian. These plants are supposed to often have ± glaucous stems and leaves. Numerous ones are not even slightly glaucous in many areas. The plants that are really glaucous have a different kind of nutlet and much shorter calyx lobes. Some of these grow in the Beartooth Mountains in Montana. These plants were reported as being common, however most of them are the following. May-Aug.

*Mertensia franciscana* A. Heller (Plates 254a, b, c)

SAN FRANCISCO MOUNTAIN BLUEBELLS. Frequent, 7000-10500 ft.; mesic slopes, riparian. May-Aug. †South of Johnson Lake 734 873E 43 12 065N Clifton 43259, Strawberry Creek 736576E 4326990N Clifton 45659, North Fork Baker Creek 734590E 4317068N Clifton 43291, Baker Creek 738904E 4318235N Clifton 42849.

***Mertensia oblongifolia*** (Nutt.) G. Don (Plates 256a, b, c)

SAGEBRUSH BLUEBELLS. Fairly frequent, 6500-10000 ft.; among sagebrush, open places. There seems to be a matter of opinion whether there are any varieties of this taxon or not. May-Jul: \*Burnt Mill Creek T13N R69E S8, Upper Timber Creek 9440 ft. Raymond Jaindl, Chalk Spring 738 254E 43 57 820N.

**OREOCARYA**

**Note:** There is no real way to separate a number of the species that have been created. From one area to another the plants look different visually, but what makes them look that way is undefinable. There are numerous plants that don't fit any of the named taxa. There are no set of correlatable characters that can be used. The nutlets seem to be different, but the type of hairs don't correlate with the nutlets.

- 1 Corolla yellow. . . . . ***O. confertiflora***
- 1 Corolla white (may have a yellow eye)
- 2 Corolla tub exserted from the calyx. . . . . ***O. flavoculata***
- 2 Corolla tub not exserted from the calyx
- 3 Nutlets smooth at 10×. . . . . ***O. cinerea***
- 3 Nutlets roughened
- 4 The lower surface of the nutlets muricate on the ridges, the scar broadly open at the base; the plants most often quite large and depressed, inflorescence mostly among the leaves. . . . . ***O. depressa***
- 4 The lower surface not muricate on the ridges, the scar narrow or if somewhat broadened, than plants biennial or short-lived perennial and the nutlets with a fairly prominent ridge on the upper surface; plants, if depressed with the inflorescence ± among the leaves, not large perennials
- 5 The nutlets essentially smooth on the surface that has the groove, broadly lanceolate; stems ± reddish. . . . . ***O. rugulosa***
- 5 The nutlets obviously fairly roughened on the surface that has the groove; stems not reddish, or if so, than nutlets glossy-tan and narrowly lanceolate
- 6 The flowers normal in fairly tight balls, become very loose on fairly long pedicels in fruit; nutlets lacking a central ridge on the none grooved side . . . . . ***O. humilis***
- 6 The lower flowers in small, several flowered clusters, if single, than not on long, thin pedicels
- 7 Old dry flowers, counting the lobes less than 4 mm long and not much over 3 mm across; plants very compact, flowering stems very short or not real obvious; strong perennials. . . . . ***O. compacta***
- 7 Old dry flowers bigger; plants not compact, flowering stems quit long
- 8 The upper leaf surface essentially lacking any coarse hairs, the pustules not real obvious; flowering rachis not elongating in fruit. . . . . ***O. welshii***
- 8 The upper leaf surface bearing some coarse hairs, the pustules quit obvious; flowering rachis elongating and in fruit
- 9 The calyx softer haired; the largest leaf blade not more than 4 mm wide; nutlet grove open at base and part way to apex. . . . . ***O. interrupta***
- 9 The calyx quit bristly; the largest leaf blade at least 8 mm wide; nutlet grove completely closed. . . . . ***O. 'scorpioides'***

***Oreocarya cinerea*** Greene

var. ***abortiva*** (Greene) G. Clifton comb. nov. (Plates 257a, b, c)

COMPACT BOW-NUT OREOCARYA. Infrequent, below 8000 ft.; rocky slopes in openings in pinyon-juniper woodland.

\*Murphy Wash 733 802E 42 92 815N Clifton 43957. [*Cryptantha cinerea* (Greene) Cronq. var. ***abortiva*** (Greene) Cronq.].

***Oreocarya compacta*** (Higgins) G. Clifton comb. nov. (Plate 258)

COMPACT OREOCARYA. Rare; incrusted, sandy soil on shallow hummocks on the valley floor. Apr.-early May. \*†Spring Creek 719 423E 43 18 028N Clifton 40945. [*Cryptantha c.* Higgins].

***Oreocarya confertiflora*** Greene (Plate 259)

GOLDEN-FLOWERED or BASIN YELLOW OREOCARYA. Infrequent, below 7000 ft.; dry washes, open gravelly slopes. Apr.-early Jun. \*Big Springs Wash, †Marble Wash 748 470E 43 69 720N Clifton 48962, †Snake Creek 742 340E 43 10 926N Clifton 49021. [*Cryptantha c.* (Greene) Payson].

***Oreocarya depressa*** (M. E. Jones) J. F. Macbr. (Plate 260)

DEPRESSED OREOCARYA. Infrequent, below 8700 ft.; rocky slopes. May-Jun. Head of Smith Creek 736 780E 43 54 674N (NAD 83) Clifton 47145. [*Cryptantha abata* I. M. Johnst.].

***Oreocarya flavoculata*** A. Nels. (Plates 261a, b, c)

YELLOW-EYE OREOCARYA. Frequent, below 8,500 ft.; dry, open often rocky slopes and flats. May-Jul: \*The Cedars T12N

R67E S2, !Baker Creek Road 741 539E 43 20 082N, †Big Spring Wash 743 205E 42 85 252N Clifton 43888, Chalk Spring 738 254E 43 57 820N. [*Cryptantha f.* (A. Nels.) Payson].

***Oreocarya humilis*** A. Gray (Plates 262a, b, c)

LOW OREOCARYA. Fairly frequent, below 9100 ft.; dry open places on shallow soil. May-Jun. !\*Osceola Road T14N R68E S5, head of Coyote Canyon 734 510E 43 67 075N Clifton 51311. [*Cryptantha h.* (A. Gray) Payson].

***Oreocarya interrupta*** Greene (Plate 263)

ELKO OREOCARYA. Rare; valley floors in sandy-gravel in light sagebrush. The leaves seem to be a little different in that they have a large number of obvious pustulate based hairs, but the nutlets seem to be about the same. These plants look like there is some gene flow from *O. rugulosa*. Apr-early May. †Highway 745 247E 43 27 439N Clifton 44003. [*Cryptantha l.* (Greene) Payson].

***Oreocarya rugulosa*** Payson (Plates 264a, b, c)

WRINKLED OREOCARYA. Infrequent, below 7500 ft.; open, gravelly soil in pinyon-juniper woodland. May-mid Jun. Red Ledges 734 514E 42 84 090N Clifton 45150, Big Springs Wash 740 683E 42 86 595N Clifton 43973, Grub Gulch 727215E 4330810N Clifton 45203. [*Cryptantha r.* (Payson) Payson].

***Oreocarya* ‘scorpioides’** (Plates 265a, b, c)

SCORPION OREOCARYA. Very infrequent, about 4970 ft.; whitish scald land. These plants are somewhat like *Oreocarya interrupta*, but the calyx hairs are very bristly and the nutlet grove is different. May-early Jul. Gandy Road 758 530E 43 56 659N Clifton 51300.

***Oreocarya welshii*** (K. Thorne & Reveal) G. Clifton comb. nov. (Plates 266a, b, c)

WELSH’S OREOCARYA. Widely scattered, below 7600 ft.; fairly open white gravelly soil or sandy subalkaline soil, limestone soil in open pinyon-juniper woodland. This taxon from the type valley has sparse hair on the leaves, thus they look green. The plants from this area look gray, because of the dense hair. May-Jun. South Highland Road 725 213E 42 96 576N Clifton 43949. [*Cryptantha w* K. Thorne & Reveal].

## TIQUILIA

***Tiquilia nuttallii*** (Hook.) A. Richardson (Plates 267)

ROSETTE TIQUILIA. Infrequent, below 6000 ft.; sandy places in desert scrub, along sandy shoulders of dirt roads. Jun-Sep. \*South Highland Road T11N R67E S34.

## BRASSICACEAE Mustard Family

- 1 Flowering plants. . . . . **KEY 1**  
 1 Fruiting plants (fruit needs to be mature in some of the plants). . . . . **KEY 2**

### KEY 1

#### Flowering plants

- 1 Flowers other than yellow, or cream  
 2 Cauline leaves with some or all of them auriculate. . . . . **Group 1**  
 2 Cauline leaves not auriculate  
 3 Herbage with some or all the hairs forked. . . . . **Group 2**  
 3 Herbage glabrous or with simple hairs only. . . . . **Group 3**  
 1 Flowers yellow, orange-yellow or cream  
 4 Leaves all or nearly all simple, margins entire, serrate, or with shallow lobes. . . . . **Group 4**  
 4 Leaves all deeply lobbed. . . . . **Group 5**

#### GROUP 1 Flowers other than yellow or cream; cauline leaves with some or all of them auriculate

- 1 Herbage with some or all the hairs branched  
 2 Petals 4 or less mm long; annual; introduced. . . . . *Capsella*  
 2 Petals 4 mm or longer; biennial or perennial; native. . . . . *Arabis*  
 1 Herbage glabrous or with simple hairs only  
 3 Leaves with some or all of them divided. . . . . *Nasturtium*  
 3 Leaves not divided  
 4 Sepals purple. . . . . *Streptanthus*

- 4 Sepals green
  - 5 Herbage glabrous..... *Thelypodium*
  - 5 Herbage bearing simple hairs..... *Cardaria*

**Group 2** Flowers other than yellow; leaves not auriculate; some hairs branched

- 1 Petals 18-25 mm long..... *Hesperis*
- 1 Petals less than 18 mm long
  - 2 Leaves pinnately lobed..... *Smelowskia*
  - 2 Leaves entire, serrate or sinuate-dentate
    - 3 Flowers white..... *Draba*
    - 3 Flowers other than white
      - 4 Leaves entire..... *Arabis*
      - 4 Leaves sinuate-dentate..... *Strigosella*

**GROUP 3** Flowers other than yellow; cauline leaves not auriculate; herbage glabrous or with simple base fixed hairs

- 1 Herbage with some of the hairs stipitate-glandular..... *Chorispora*
- 1 Herbage lacking glandular hairs
  - 2 Petals 0-3.5 mm long
    - 3 Herbage pubescent..... *Lepidium*
    - 3 Herbage glabrous..... *Hornungia*
  - 2 Petals greater than 3.5 mm long, if less than 3.5, plants growing in water
    - 4 Plants lacking leaves on the flowering stem..... *Draba*
    - 4 Plants with leaves on the flowering stem
      - 5 Plants growing in moist places, mostly along streams and springs; rhizomatous..... *Cardamine*
      - 5 Plants growing in dry places, if in moist places, stems glaucous, taprooted
        - 6 Sepals with scarious margins..... *Streptanthella*
        - 6 Sepals lacking scarious margins
          - 7 Leaves entire to denticulate..... *Thelypodium*
          - 7 Leaves lyrate-pinnate or irregularly pinnatifid, if entire, stems inflated..... *Caulanthus*

**GROUP 4** Flowers yellow, orange-yellow or cream; leaves all or nearly all simple

- 1 Cauline leaves with some or all auriculate-clasping
  - 2 Plants with a well developed basal rosette at flowering time; pedicels erect..... *Turritis*
  - 2 Plants lacking a well developed basal rosette at flowering time; pedicels spreading..... *Camelina*
- 1 Cauline leaves not auriculate
  - 3 Herbage glabrous..... *Schoenocrambe*
  - 3 Herbage with at least some h
    - 4 Pubescence of appressed Y-shaped and/or malpighiaceus hairs..... *Erysimum*
    - 4 Pubescence of simple or branched hairs that are  $\pm$  erect or appressed multibranching hairs
      - 5 Pubescence of simple or branched hairs that are  $\pm$  erect
        - 6 Plants usually less than 2 dm tall, inflorescence few flowered; native..... *Draba*
        - 6 Plants usually well over 2 dm tall, inflorescence many flowered; introduced..... *Brassica*
      - 5 Pubescence of appressed multibranching hairs
        - 7 Plants annual; introduced weed..... *Alyssum*
        - 7 Plants perennial; native..... *Physaria*

**GROUP 5** Flowers yellow, or cream; leaves all deeply lobbed

- 1 Cauline leaves with some or all of them auriculate
  - 2 Upper cauline leaves falsely perfoliate-clasping..... *Lepidium*
  - 2 Upper cauline leaves various, not as above
    - 3 The terminal lobe of the basal leaves well developed and about as long as wide..... *Barbarea*
    - 3 The terminal lobe of the basal leaves scarcely developed, if present much longer than wide..... *Rorippa*

- 1 Cauline leaves not auriculate
  - 4 Petals 11-17 mm long. . . . . *Stanleya*
  - 4 Petals under 10 mm long
    - 5 Plants a rhizomatous perennial. . . . . *Rorippa*
    - 5 Plants a taprooted annual
      - 6 Petals 6-8 mm long. . . . . *Sisymbrium*
      - 6 Petals 1-4 mm long. . . . . *Descurainia*

## KEY 2

### Fruiting plants

- 1 Fruit generally less than 3 times longer than wide. . . . . **Group 1**
- 1 Fruit generally 3 times longer than wide
  - 5 Herbage glabrous or with simple, base-fixed hairs. . . . . **Group 2**
  - 5 Herbage with some or all hairs branching. . . . . **Group 3**

#### GROUP 1 Fruit generally less than 3 times longer than wide

- 1 Mature fruit inflated, over 1 cm long. . . . . *Physaria*
- 1 Mature fruit not inflated, if appearing inflated, than less than 1 cm long
  - 2 Cauline leaves with some or all auriculate or cordate-clasping
    - 3 Cauline leaves with the cordate-clasping lobes overlapping. . . . . *Lepidium*
    - 3 Cauline leaves with the auriculate lobes not overlapping
      - 4 Cauline leaves remotely to irregularly serrate-dentate
        - 5 Inflorescence racemose; fruit flat. . . . . *Capsella*
        - 5 Inflorescence of corymbose racemes; fruit globose inflated
          - 4 Cauline leaves nearly or quite entire; fruit rounded at apex. . . . . *Camelina*
    - 2 Cauline leaves not auriculate or cordate-clasping
      - 6 Siliques on gynophores 2-4 mm long. . . . . *Brassica*
      - 6 Siliques sessile or on gynophores less than 1 mm long
        - 7 Plants glabrous. . . . . *Hornungia*
        - 7 Plants hairy, at least in part
          - 8 Septum horizontal, parallel with the top of the fruit
            - 9 Hairs multi-rayed from a  $\pm$  connate base. . . . . *Physaria*
            - 9 Hairs not as above or lacking
              - 10 Leaves pinnate. . . . . *Descurainia*
              - 10 Leaves simple
                - 11 Seeds usually over 2 per locule; native, not weedy. . . . . *Draba*
                - 11 Seeds 2 per locule; weedy. . . . . *Alyssum*
        - 8 Septum vertical, parallel to the edge of the fruit. . . . . *Lepidium*

#### GROUP 2 Fruit generally 3 times longer than wide

- 1 Cauline leaves with some or all of them auriculate
  - 2 Most of the leaves divided
    - 3 Plants taprooted; fruiting pedicels 2-3 mm long. . . . . *Barbarea*
    - 3 Plants with creeping roots or rooting at the nodes; fruiting pedicels 5-15 mm long. . . . . *Rorippa*
  - 2 Leaves simple
    - 4 Cauline leaves broad; basal leaves coarsely dentate. . . . . *Streptanthus*
    - 4 Cauline leaves lance-linear; basal leaves  $\pm$  entire. . . . . *Thelypodium*
- 1 Cauline leaves not auriculate
  - 5 Herbage with some of the hairs stipitate-glandular. . . . . *Chorispora*
  - 5 Herbage lacking stipitate-glandular hairs
    - 6 Stems hollow. . . . . *Caulanthus*
    - 6 Stems not hollow
      - 7 Plants with creeping underground roots, often of moist places
        - 8 Leaves simple and cordate. . . . . *Cardamine*

- 8 Leaves with some or all divided
  - 9 Plant with the upper leaves linear; plants of dry places. . . . . *Schoenocrambe*
  - 9 Plants with none of the leaves linear; plants of wet or moist places
    - 10 The end leaflet much larger than the lateral. . . . . *Cardamine*
    - 10 The end leaflet about the same size as the lateral. . . . . *Nasturtium*
- 8 Plants lacking creeping underground roots, often in dry places
  - 11 Plants a subshrub. . . . . *Stanleya*
  - 11 Plants herbaceous
    - 12 Herbage glabrous
      - 13 Pods appressed-reflexed. . . . . *Streptanthella*
      - 13 Pods ascending. . . . . *Thelypodium*
    - 12 Herbage at least hairy in part
      - 14 Cauline leaves divided into linear segments. . . . . *Sisymbrium*
      - 14 Cauline leaves not divided into linear segments. . . . . *Caulanthus*

**GROUP 3** Fruit generally 3 times longer than wide; herbage with some of the hairs branched

- 1 Leaves pinnate
  - 2 Plants perennial. . . . . *Smelowskia*
  - 2 Plants annual. . . . . *Descurainia*
- 1 Leaves simple
  - 3 Cauline leaves auriculate
    - 4 Fruit flattened. . . . . *Arabis*
    - 4 Fruit most often subterete-quadrangular. . . . . *Turritis*
  - 3 Cauline leaves not auriculate
    - 5 Pods sessile. . . . . *Strigosella*
    - 5 Pods on pedicels
      - 6 Styles on the fruit very short to obsolete
        - 7 Stigma deeply bilobate, massive; leaves serrate to sinuate-dentate. . . . . *Hesperis*
        - 7 Stigma shallow-bilobate, small; leaves entire. . . . . *Arabis*
      - 6 Styles on the fruit 1-4 mm long. . . . . *Erysimum*

**ALYSSUM**

- 1 Fruit glabrous. . . . . *A. desertorum*
- 1 Fruit hairy. . . . . *A. simplex*

*Alyssum desertorum* Stapf (Plates 268a, b)

DESERT MADWORT. Fairly frequent, below 7500 ft.; rocky or sandy soil in sagebrush, waste places; introduced from Europe. May-Jun. \*Baker Creek 738 972E 43 18 671N.

*Alyssum simplex* Rudolphi (Plates 269a, b)

FIELD MADWORT. Rare, about 6810 ft.; disturbed places. May-Jun. \*Lehman Caves 740 990E 43 20 675N Clifton 51254. [*A. parviflorum* Fisch. ex M. Bieb. var. *micranthum* C. A. Mey.) Dorn].

**ARABIS** Rock Cress

**Note:** Most of the species of *Arabis* have been put in the genus *Boechea* by recent molecular phylogenetic studies (not real), however this has not helped us in any way, shape or form in understanding these plants. They stick several unlike genera between *Arabis* and *Boechea* to make it look like the separation is real. This author is only interested in making it as simple as possible, so the genus *Arabis* is left intact except *Arabis glabra* which is put back in its old genus because it doesn't have flatten fruit. There are many plants that don't fit any named taxon. These plants don't form populations, they are widely scattered. There is often some other taxon growing nearby.

- 1 Plants with either the leaves or stem having the hairs laying flat, both ends free (often very sparse); fruit strictly erect. . . . . *A. drummondii*
- 1 Plants not combining the above characters
  - 2 The upper most leaves densely pubescent

- 3 Basal and cauline leaves oblanceolate 3-10 mm wide; stems whitish-gray. . . . . *A. shockleyi*  
 3 Basal and cauline leaves linear to linear-oblongate 1-2 mm wide; stems dull brownish. . . . . *A. lincolnensis*  
 2 The upper leaves from glabrous to slightly pubescent  
 4 Fruit ascending, spreading and descending all on the same plant. . . . . cross  
 4 Fruit one way, ascending, spreading or descending  
 5 Plants with the flowers pendent; fruit strictly reflexed, mostly appressed to the stem. . . . . *A. retrofracta*  
 5 Plants not as above  
 6 Sepals purplish; fruit secund from slightly ascending to slightly descending. . . . . *A. lemmonii*  
 6 Sepals greenish; fruit not secund  
 7 Fruiting pedicels with most of them spreading by more than 30 degrees  
 8 Plants with the stems coming out from under the central clump of leaves or from next to sterile shoots; lower stems  
 with simple trichomes, rarely with a very few 2-branched hairs, sometimes almost glabrous. . . . . *A. pendulina*  
 8 Plants not as above  
 9 Cauline leaves not auriculate. . . . . *A. pendulocarpa*  
 9 Cauline leaves auriculate  
 10 Inflorescence 16-88 flowered; caudex if present at ground surface. . . . . *A. grahamii*  
 10 Inflorescence up to 10 flowered; caudex well under the ground. . . . . *A. 'petra'*  
 7 Fruiting pedicels spreading by less than 30 degrees  
 11 Basal leaves mostly 1-4 mm wide. . . . . *A. microphylla*  
 11 Basal leaves 9+ mm wide. . . . . *A. eschscholtziana*

***Arabis* cross (Plate 270)**

DISHEVELED ROCK CRESS. Fairly frequent, 8000-10600 ft.; rocky, open forest floors. Jun-Aug. †Dead Lake 735 523 43 12 382, †Stella Lake 732 561 43 20 455, Decathon Canyon 737 646E 43 00 803N Clifton 45234, South Fork Baker Creek 737374E 4314826N Clifton 48800, \*†South Fork Baker Creek 737374E 4314826N Clifton 48800.

***Arabis drummondii* A. Gray (Plates 271a, b, c)**

DRUMMOND'S ROCK CRESS. Fairly frequent, 8000-11000 ft.; rock crevices, talus, ledges, open woods and meadows. Jun-Aug. \*below Johnson Lake T13N R69E S36, †Stella Lake 732 245 43 20 437 Clifton 42989, †Shingle Creek 729455E 4320426N Clifton 45680. [*Boechea stricta* (Graham) Al-Shehbaz].

***Arabis eschscholtziana* Andrz. (Plates 272a, b, c)**

WESTERN ROCK CRESS. 7000-8500 ft.; open woods, steep slopes, margins of pinyon-juniper woodland. May-Jul. \*Baker Creek T13N R69E S21, !Burnt Mill Canyon T13N R69E S6, Chalk Spring 738 254E 43 57 820N, Cedar Cabin Spring 741273E 4297807N. [*A. hirsuta* (L.) Scop. var. *glabrata* T. & G.].

***Arabis grahamii* (Lehm.) G. Clifton (Plates 273a, b, c)**

GRAHAM'S ROCK CRESS. Infrequent, 8500-10400 ft.; rocky slope in openings. The description for *A. divaricarpa* is essentially the same as this one. May-Aug. Big Canyon 741 432E 43 52 274N Clifton 52126. [*A. divaricarpa* A. Nels., *Boechea d.* (A. Nels.) Á & D. Löve].

***Arabis lemmonii* S. Wats. (Plates 274a, b, c)**

LEMON'S ROCK CRESS. Fairly frequent, 10000-11500 ft. open rocky slopes, crevices of cliffs. Jun-Sep. \*above Stella Lake T13N R68E S11, !Bald Mountain T13N R68E S2, North Fork Baker Creek 734 590 43 17 068. [*Boechea l.* (S. Wats.) W. A. Weber].

***Arabis lincolnensis* (Windham & Al-Shehbaz) G. Clifton comb. nov. (Plates 275a, b)**

LINCOLN COUNTY ROCK CRESS. Infrequent, below 7500 ft.; rock outcrops, canyon slopes, gravelly slopes. The type is from Muncy on the east flank of the Schell Creek Range. Plate b shows part of the surface of the fruit. Apr-May. \*Highway 894 726 265E 43 04 952N Clifton 43936. [*A. pulchra* M.E. Jones var. *munciensis* M.E. Jones, *Boechea l.* Windham & Al-Shehbaz].

***Arabis microphylla* Nutt. (Plate 276)**

SMALL-LEAF ROCK CRESS. Limited, about 8360 ft.; ledges on steep rocky slopes. May-early Jun. †Shingle Creek 729455E 4320426N Clifton 45679. [*Boechea m.* (Nutt.) Dorn].

***Arabis pendulina* Greene (Plates 277a, b, c, d)**

DROOPING ROCK CRESS. Infrequent, 7000-11400 ft.; rocky slopes, ridges, crevices, often on limestone. *Arabis demissa* is the same as *Arabis oxylobula* which is endemic to Colorado. May-early Aug. †Highland Ridge 734 750E 43 06 771N Clifton 38449, \*†Decathon Canyon 736 250E 43 01 793N Clifton 45242. [*A. demissa* Greene, *Boechea p.* (Greene) W. A. Weber].

***Arabis pendulocarpa* A. Nels. (Plates 278a, b)**

DEFLEXED ROCK CRESS. Infrequent, 7500-11000 ft.; open rocky places, open conifer forest. The plants from The Table come close to this taxon. The type for *Boechea* or *Arabis exilis* is the same as *Arabis retrofracta* depending on who you want to believe. Jun. †The Table 741944E 4352615N (NAD 83) Clifton 47176, Big Canyon 741 406E 43 52 274N Clifton 52125.

[*Boecheera exilis*. A. Nels.) Dorn, *B. pendulocarpa* (A. Nels.) Windham & Al-Shehbaz].

*Arabis retrofracta* Graham (Plates 279a, b, c)

Frequent, above 6000 ft.; openings in woods, sagebrush. May-Aug. Lehman Creek T13N R68E S8, !Buck Mountain T13N R68E S1, \*South Fork Baker Creek 738076E 43171082 Clifton 48846. Decathon Canyon 737 237E 43 00 530N Clifton 45231. [*A. holboellii* Hornem. var. *r.* (Graham) Rydb, *Boecheera r.* (Graham) A. & D. Löve].

*Arabis shockleyi* Munz (Plates 280a, b)

SHOCKLEY'S ROCK CRESS. Infrequent, 5500-6600 ft.; rocky slopes on limestone. Apr-May. \*Snake Creek Cave T12N R70E S13, †Big Springs Wash 740 942E 42 87 000N Clifton 43971. [*Boecheera s.* (Munz) Dorn].

#### BARBAREA Winter Cress

*Barbarea orthoceras* Ledeb. (Plates 281a, b)

AMERICAN WINTER CRESS. Fairly frequent, below 10000 ft.; damp meadows, streams, and other moist places. !Lehman Creek T13N R69E S8, \*Baker Creek 739050E 4318640N Clifton 48809.

#### BRASSICA

*Brassica elongata* Ehrh. (Plates 282a, b, c)

PERENNIAL MUSTARD. Limited, about 6100 ft.; along road margins, spreading into the open desert; introduced from Eurasia. The plants are outside of the area of this treatment, but close enough that they could appear in the future. Known from 2.5 miles south of Highway 50 on Highway 93. It is fairly common on the road banks in the Ely area. Jun-Jul:

#### CAMELINA

*Camelina microcarpa* Andr. (Plates 283a, b, c)

SMALL-FRUITED FALSE FLAX. Fairly frequent, below 8500 ft.; along roads, in pinyon juniper woodland, dry creek beds; introduced from Europe. May-Jul. \*Baker Creek T13N R69E S22, Lehman Creek T13N R69E S8, †Highway 894 726 265E 43 04 952N Clifton 43937, Chalk Spring 738 254E 43 57 820N, Lehman Creek 737 530E 43 2 1650N Clifton 48974.

#### CAPSELLA

*Capsella bursa-pastoris* (L.) Medic. (Plates 284a, b)

SHEPHERD'S PURSE. Infrequent, below 9100 ft.; margins of roads, moist disturbed places, trail margins; introduced from Europe. Apr-Aug. \*Baker Creek 738 756E 4317 586N, Baker Creek 736 378E 43 17 140N.

#### CARDAMINE Bitter-Cress

1 Leaves all simple; petals 7-12 mm long. . . . . *C. cordifolia*

1 Leaves mostly compound; petals 2-7 mm long. . . . . *C. breweri*

*Cardamine breweri* S. Wats.

var. *breweri* (Plates 285a, b)

BREWER'S BITTER-CRESS. Fairly frequent, 6000-8500 ft.; along streams and about springs. Jun-Jul: !Lehman Creek T13N R69E S8, Pine Creek 729 162E 43 19 359N, \*Lehman Creek 737 617E 43 21 475N Clifton 48975.

*Cardamine cordifolia* A. Gray (Plates 286a, b, c)

HEARTLEAF BITTER-CRESS. Frequent, 7000-10000 ft.; along streams and wet meadows. Jun-Sep. \*Baker Creek 739 050E 43 18 640N Clifton 48812.

#### CARDARIA Cress

1 Sepals and fruit glabrous. . . . . *C. draba*

1 Sepals and fruit hairy. . . . . *C. pubescens*

*Cardaria draba* (L.) Desv.

a The claw of the petals equal to or slightly exserted; the fruit cordate to reniform; leaves from entire to slightly dentate. . . . . var. *draba*

a The claw of the petals well included; fruit rounded to somewhat acute; leaves coarsely dentate. . . . . var. *repens*

var. *draba*

HEART-POD HOARY CRESS. Rare, below 8600 ft.; waste places and old fields; introduced from Europe. May-Aug. \*North Branch Rye Grass Canyon 736700E 4362390N Clifton 48915.

var. *repens* (Schrenk) O. E. Schulz (Plates 287a, b)

LENS-POD HOARY CRESS. Rare, about 8000 ft.; dry meadows; introduced from Europe. Jun-early Jul. \*Strawberry Creek 733127E 4326219N Clifton 49014

*Cardaria pubescens* (C.A. Mey.) Jarmol.

GLOBE-PODDED HOARY CRESS, WHITE-TOP. Infrequent, below 6100 ft. old fields and waste places; introduced probably from Asia. Apr-Aug. \*Snake Creek 749 627E 43 11 434N.

### CAULANTHUS

1 Leaves hairy. . . . . *C. pilosus*

1 Leaves glabrous . . . . . *C. crassicaulis*

*Caulanthus crassicaulis* (Torr.) S. Wats.

a Inflorescence extending well down the inflated stem; calyx densely pubescent . . . . . var. *crassicaulis*

a Inflorescence usually above the inflated stem; calyx glabrous or with a few hairs at apex (rarely lightly pubescent throughout). . . . . var. *glaber*

var. *crassicaulis* (Plates 288a, b, c)

THICK-STEMMED WILD CABBAGE. Fairly frequent, 6500-9000 ft., North Snake Range; openings in gravelly soil in pinyon-juniper woodland. Mid Jun-Jul. West of Mud Spring 734 900E 43 55 805N (NAD 83) Clifton 47185, \*Dry Canyon 732 130E 43 61 790N Clifton 48895.

var. *glaber* M. E. Jones (Plate 289)

GLABROUS CALYX THICK-STEMMED WILD CABBAGE. Widely scattered, 8500 ft.; open fairly bear soil, canyons, slopes. May-Jul: †Murphy Wash 731 390E 42 90 476N Clifton 43954, Baker Creek 741 549E 43 20 139N, \*Snake Creek 748 624E 43 11 990N Clifton 43996.

*Caulanthus pilosus* S. Wats. (Plates 290a, b)

HAIRY WILD CABBAGE. Infrequent, 5400-6000 ft.; low sage and shadscale scrub. Late Apr-May: \*Weaver Creek T14N R69E S15.

### CHORISPORA

*Chorispora tenella* (Pallas) DC. (Plates 291a, b)

MUSK-MUSTARD. Infrequent, below 8400 ft.; waste places; introduced from Europe; introduced from Europe. May-Sep. \*The Cedars T12N R67E S2, Strawberry Creek 7700 ft. Ray Jaindl., Chalk Spring 738 254E 43 57 820N, †Baker Creek 739 393E 43 18 857N Clifton 48797.

### DESCURAINIA Tansy Mustard

**Note:** There are no reliable distinctions that separate *D. incisa* and *D. pinnata* without the fruit. Many other plants don't fit completely any named taxon.

1 Flowers white; developing siliques overtopping the apex of elongating inflorescence. . . . . *D. "albiflora"*

1 Flowers cream to yellow; developing siliques only slightly to not at all overtopping the elongating inflorescence

2 Fruit 2.2-4.7 mm long

3 Fruit distinctly tapering at both ends, almost linear; leaflets fairly broad. . . . . *D. californica*

3 Fruit not as tapered, broader; leaflets narrow. . . . . *D. paradisica*

2 Fruit longer than 4.7 mm

4 Siliques 14-28 mm long; fruit slim. . . . . *D. sophia*

4 Siliques just barely reaching 15 mm long; fruit most often somewhat broader

5 The sepals tinted with rose to purplish. . . . . *D. pinnata*

5 The sepals greenish. . . . . *D. incisa*

***Descurainia* “albiflora”**

WHITE-FLOWERED TANSY-MUSTARD. In frequent, valley floors in sand. These plants have the siliques tapering at both ends, 4-5 mm long the seeds are in one row and about 4 per locule. The flowers remain white even when dried. This one is most likely not real either. May. †South Highland Road 725 568E 42 96 300N Clifton 43948

***Descurainia californica* (A. Gray) Schulz (Plates 292a, b)**

CALIFORNIA TANSY-MUSTARD. Frequent, 7000- 10000 ft.; openings in sagebrush, open woodland, gravel and talus slopes, dry ledges. Jun-Jul. Lehman Creek Campground T13N R69E S8, Big Springs Wash T9N R69E S2, \*Burnt Mill Canyon T13N R69E S6, Baker Creek.

***Descurainia incisa* (Engelm. ex A. Gray) Britt**

var. *incisa* (Plates 293a, b)

SHORT-PEDICELLED TANSY-MUSTARD. Fairly frequent, below 10000 ft.; dry disturbed and rocky places. Jun-Aug. Baker Creek Campground 738937E 4318525N Clifton 48799

***Descurainia paradisica* (A. Nels. & Kenn.) O. Schulz**

var. *nevadensis* (Rollins) N. Holmgren (Plate 294)

NEVADA TANSY-MUSTARD. Infrequent, below 7400 ft.; gravelly soil along washes. May-Jun. †Coyote Canyon 741600E 4368080N Clifton 48937.

***Descurainia pinnata* (Walt.) Britt. (Plates 295a, b, c)**

VARIABLE TANSY-MUSTARD. Frequent, below 10200 ft.; all kinds of habitats. There is absolutely no way to separate with any kind of constancy all the named taxa. Just when you think you have them figured out, you find another one that doesn't fit. There are trends within this group, with some of them fairly constant, but there are just enough plants that are in-between to make them inconstant. May-Jul. \*Close to Cave Canyon 748 058E 43 12 415N, \*The Cedars T12N R67E S2, \*Hamlin Valley T10N R70E S13, \*Snake Creek 747 836E 43 11 433N Clifton 43997, Chalk Spring 738 254E 43 57 820N. [*D. p.* (Walt.) Britt. var. *osmiarum* (Cockerell) Shinn.].

***Descurainia sophia* (L.) Webb. (Plates 296a, b)**

FLIXWEED, COMMON TANSY-MUSTARD. Widely scattered, below 9000 ft.; waste places, often invading native habitat; introduced from Europe. Apr-Jul. \*Hamlin Valley T10N R70E S13, Chalk Spring 738 254E 43 57 820N.

**DRABA**

**Note:** The difference between some of these taxa is problematical. The characters used to separate *D. crassifolia* and *D. fladnizensis* completely broke down. Since the petals fade to white, herbarium specimens mean little. It is said that the petals of *D. crassifolia* are rounded, this is not true at all, as the plants from San Francisco Mountain in Arizona are emarginate. There are plants that seem to be strong perennials that have emarginate petals, but the fruit is too large and so are the leaves. The path of least resistance in this treatment is to call all of them *D. crassifolia*, even though *D. fladnizensis* is said to grow here. The illustration of the fruit (N. P. Holmgren 2005) for *D. crassifolia* shows the fruit hairy, but all references say the fruit is glabrous.

- 1 Upper leaf surfaces bearing multi branched hairs that are fairly numerous
- 2 Hairs pectinate, generally with the main branch parallel to the margin of the leaves (this some times hard to see since the hairs are so thick; stems sometimes glabrous). . . . . *D. oligosperma*
- 2 Hairs not so arranged
- 3 Plants tangled mats of loose leafy sterile and fertile stems. . . . . *D. pennellii*
- 3 Plants otherwise
- 4 Stems bearing 1 or more leaves that are above the basal cluster
- 5 Flowers yellow (old flowers may fade white)
- 6 Plants annual; below 7500 ft. and flowering Apr-Jun. . . . . *D. nemorosa*
- 6 Plants perennial; above 9000 ft. and flowering Jul-Aug. . . . . *D. aurea*
- 5 Flowers white or sometimes petals lacking
- 7 Plants perennial most often above timberline; stem leaves well developed up to the inflorescence. . . . . *D. cana*
- 7 Plants annual; pinyon belt and lower; leafy sometimes up to ½ stem height. . . . . *D. cuneifolia*
- 4 Stems leafless above the basal cluster
- 8 Flowers yellow; silicles 2.2-4.2 mm wide, ovate-elliptic to broadly lanceolate. . . . . *D. pedicellata*
- 8 Flowers white; siliques 1-1.7 mm wide, linear to narrowly lanceolate. . . . . *D. lonchocarpa*
- 1 Upper leaf surface glabrous, or sparsely to fairly densely hairy, hairs simple or 2-branched or both present (rarely a few multi branched hairs present), margins often ciliate
- 9 Plants with a many branched caudex; styles very obvious. . . . . *D. serpentina*

9 Plants lacking a many branched caudex; styles very short

10 Plants with the lower leaf surface bearing some branched hairs; stems generally with 3-4 leaves . . . . . *D. albertina*

10 Plants not combining the above 2 characters. . . . . *D. crassifolia*

***Draba albertina*** Greene (Plates 297a, b)

ALASKA or SLENDER WHITLOW-GRASS. Fairly frequent, 7500-10500 ft.; meadows, rocky slopes, openings in woodland, and disturbed places. In the Stella Lake area this taxon and *D. crassifolia* were growing together and there were plants present that were intermediate between the two. In other places the differences between this and *D. crassifolia* become rather nebulous. There are plants on South Fork Baker Creek that have the whole plant hairy, including the fruit. There are plants in Franklin County, Idaho that have the same kind of hairs on the fruit, but rest of the inflorescence is glabrous. May-Aug. \*Stella Lake T13N R68E S11, †Stella Lake 732 316E 43 20 310N, †Wheeler Peak Campground 733020E 4321110N Clifton 48882. [*D. stenoloba* Ledeb. var. *nana* (O. Schulz) C. Hitchc.].

***Draba aurea*** Hornem. (Plates 298a, b)

GOLDEN DRABA. Infrequent, 10400-12500 ft.; rocky slopes. Jul-Aug. \*Wheeler Peak 731974E 4320724N Clifton 42954

***Draba cana*** Rydb. (Plate 299)

HOARY DRABA. Infrequent, limited to Wheeler Peak, 10600-12500 ft.; rocky slopes. Jul-Aug. \*above Stella Lake T13N R68E S11, †Wheeler Peak 731 979E 43 20 122N Clifton 42959.

***Draba crassifolia*** Graham

SNOWBED WHITLOW-GRASS. Infrequent, 10000-11000 ft.; rocky slopes, small meadows. Late Jun-Jul. \*Pyramid Peak 733783E 4314750N, †Stella Lake 732316E 4320310N Clifton 42996, †Horse Heaven 742907E 4314357N Clifton 45298, †Wheeler Peak 732287E 4319784N Clifton 36285.

***Draba cuneifolia*** T. & G.

var. *cuneifolia* (Plate 300)

WEDGE-LEAVED DRABA. Infrequent, below 8300 ft.; limestone slopes in rocks, valley floors in sand, gravelly slopes. Apr-May. Burnt Mill 5740 ft., †The Cedars 723814E 4312591N Clifton 43925, \*Coyote Canyon 737850E 4367156N Clifton 48933

***Draba lonchocarpa*** Rydb.

LANCE-POD WHITLOW-GRASS, LONG-FRUITED DRABA. Fairly infrequent, about 10400-11400 ft.; steep, rocky limestone slopes. Jul. †Mt. Washington 733582N 4310488N Clifton 45281, \*Highland Ridge 735115E 4306428N Clifton 44528, The Table 742130E 4351860 (NAD 83) Clifton 47156.

***Draba nemorosa*** L. (Plates 301a, b, c)

WOOD WHITLOW-GRASS. Limited, below 7500 ft.; open flats, and slopes, disturbed places. Apr-Jun. \*†Baker Creek 739393E 4318857N Clifton 48795.

***Draba oligosperma*** Hook. (Plates 302a, b)

FEW-SEEDED DRABA. Fairly frequent, 9000-12000 ft.; crevices in rock, gravelly flats and slopes. Jun-Jul. \*above Williams Canyon T13N R68E S35, †Highland Ridge 735 393E 43 05 106N Clifton 45271, Head of Smith Creek 736 780E 43 54 674N (NAD 83) Clifton 47147, The Table 742 249E 43 51 786 (NAD 83) Clifton 47160, Miller Basin Wash 732 290E 43 42 976N Clifton 48991.

***Draba pedicellata*** (Rollins & R. A. Price) Windham

var. *wheelerensis* N. H. Holmgren (Plates 303a, b)

SNAKE RANGE DRABA. Limited to the highest areas of the range; rocky slopes and crevices of cliffs. Al-Shehbaz, Windham, Elven (FNANM 2010) consider this taxon to be the same as the species. They also make a false statement by saying that this taxon is found only on non limestone soil, however it is found on limestone soil on Mt. Washington and Highland Ridge. They also say that this and the species have rosulate basal leaves. Some plants do and some don't. There are plants on Mt. Moriah that have much larger fruit than all the others that grow in this Range and may be the species. These plants are extremely variable from one spot to another, to the point that you could make several more taxa out of them. Holmgren named one end of the spectrum. The above variety looks real, but is it? Jul-Aug. †Highland Ridge 734750E 4306771N, Wheeler Peak T13N R68E S15, †Highland Ridge 735 115 4306428 Clifton 44527, The Table 742 130E 43 51 860 (NAD 83) Clifton 47157, †Mt Moriah 741 465E 43 50 680N Clifton 52235.

***Draba pennellii*** Roll.

PENNELL'S WHITLOW-GRASS. Limited, 6100-6800 ft.; steep limestone slopes, in crevices and vertical cliffs. May-Jun. \*†Highway 50 725 143E 43 38 983N Clifton 44009.

***Draba serpentina*** (Tiehm & P. Holmgren) Al-Shehbaz & Windham (Plates 304a, b, c)

SNAKE RANGE DRABA. Locally frequent, 10400-11000 ft. Jul-Aug. †Baker Lake T13N R68E S26, \*above Williams Canyon T13N R68E S35, †Baker Lake 733 400E 43 15 074N Clifton 40990, †Highland Ridge 734 357E 43 07 856N Clifton 45274. [*D. oreibata* Macbr. & Payson var. *s.* Tiehm & P. Holmgren].

**ERYSIMUM** Wallflower

- 1 Petals less than 12 mm long and 3 mm wide
- 2 Plants biennial or short lived perennial, old leaf base often present; pedicels 6-10 mm long. . . . . *E. inconspicuum*
- 2 Plants annual, old leaves bases lacking; pedicels 2-4.5 mm long. . . . . *E. repandum*
- 1 Petals greater than 12 mm long and 5 mm wide. . . . . *E. asperum*

***Erysimum asperum*** (Nutt.) DC. (Plate 305)

ROUGH WALLFLOWER. Infrequent, below 10000 ft.; dry places, slopes, meadows, rocky ridges. This taxon differs from *E. capitatum* in that the fruit is 4-angled, quite densely hairy with a single kind of hair. May-Sep. †Big Spring Wash 742 963E 42 84 280N Clifton 43972. [*E. capitatum* (Dougl. ex Hook.) Greene var. *purshii* (Durand) Rollins, misapplied].

***Erysimum inconspicuum*** (S. Wats.) MacMillanvar. *inconspicuum*

SMALL-FLOWERED WALLFLOWER, SMALL-FLOWERED PRAIRIE ROCKET. Infrequent, below 7000 ft.; dry, often alkaline soil, dry slopes, sandy places, roadsides, among sagebrush. May-Aug. Decathon Canyon 7620 ft. Raymond Jandl., Highway 50 725143E 4338983N Clifton 44011, †Black Horse Canyon 734230E 4333960N Clifton 48978.

***Erysimum repandum*** L. (Plate 306)

SPREADING WALLFLOWER. Infrequent, below 7000 ft.; road margins and other waste places; introduced from Europe. Apr-May. The Troughs Road 733388E 4281953N Clifton 43984

**HESPERIS*****Hesperis matronalis*** L. (Plate 307)

DAME'S ROCKET. Limited, 6920; along a road; introduced from Europe. Jun-Jul. !Osceola T14N R68E S12.

**HORNUNGIA*****Hornungia procumbens*** (L.) Hayek (Plates 308a, b)

OVALPURSE. Infrequent, below 7000 ft.; flats and valley bottoms, in moist, often saline or alkaline soil. Apr-Jun. \*The Cedars T12N R67E S2. [*Hutchinsia* is illegitimate; *Hymenolobus p.* (L.) T. & G.].

**LEPIDIUM** Pepper-Grass

- 1 Leaves obviously dimorphic, lower pinnate, upper simple, perfoliate and clasping. . . . . *L. perfoliatum*
- 1 Leaves not as above
- 2 Cauline leaves sagittate-clasping. . . . . *L. campestre*
- 2 Cauline leaves not clasping
- 3 Styles exceeding the apical notch of the fruit. . . . . *L. montanum*
- 3 Styles not exceeding the apical notch
- 4 Petals lacking, rudimentary, or no more than 1 mm long, the are broader at the base than the narrow top
- 5 Plants with the stem and inflorescence hairs mostly blunt  $\pm$  flattened, very short, straight; margins of leaves with short sharp pointed hair; the hairs on the young inflorescence branches and pedicels appear glandular at 30 $\times$ . . . . . *L. densiflorum*
- 5 Plants with all hairs sharp pointed, if some not sharp pointed, than curved; inflorescence not as above. *L. lasiocarpum*
- 4 Petals broader at the top than the bottom, most often longer than the sepals . . . . . *L. virginicum*

**Note:** There is a serious mistake in the most recent publication for this area. It says that the petals for *L. lasiocarpum* are 1.2-1.7 mm long, however all other publications say that they are lacking to rudimentary. There are plants that seem to incorporate characters of *L. lasiocarpum* and *L. densiflorum*, which means that most likely these two taxa should be lumped into a single polymorphic group.

***Lepidium campestre*** (L.) R. Br. (Plates 309a, b)

POORMAN or ENGLISH PEPPER-GRASS, FIELD CRESS. Limited, about 6920 ft.; along roads and other waste places. May-Jul. Grub Gulch at Osceola.

***Lepidium densiflorum*** Schrader

a Fruit hairy. . . . . var. ***pubicarpum***  
 a Fruit glabrous. . . . . var. ***densiflorum***

var. ***densiflorum*** (Plates 310a, b)

DENSE-FLOWERED PEPPERWORT. Infrequent, below 7000 ft.; rocky open sagebrush slopes. Apr-Jun. Highway 894 726265E 4304952N Clifton 43935.

var. ***pubicarpum*** (A. Nels.) Thell.

DENSE-FLOWERED PEPPERWORT. Widely scattered, below 7000 ft.; fields, road banks, open sagebrush, canyon bottoms, and dry meadows. This taxon is not recognized in the latest works. Apr-Jun. \*Highway 894 T13N R67E S15.

***Lepidium lasiocarpum*** T. & G. (Plates 311a, b)

HAIRY-POD [PEPPERWORT. Infrequent, below 6200 ft.; sandy soil in sagebrush. Apr-May. South Highland Road 725568E 4296300 Clifton 43945. [var. *georgianum* (Rydb.) C. Hitchc.].

***Lepidium montanum*** Nutt.

var. ***montanum*** (Plates 312a, b)

MOUNTAIN PEPPERWORT. Infrequent, below 6000 ft.; saline soils in chenopod scrub. In the most recent works all the varieties have been lumped. Apr-Sep. \*Spring Valley T13N R67E S33, †Murphy Wash 731 170E 42 90 405N Clifton 44976.

***Lepidium perfoliatum*** L. (Plate 313)

ROUND-LEAVED PEPPERWORT. Fairly frequent, below 8500 ft.; along roads and other waste places, sometimes invading native habitat; introduced from Eurasia. Apr-Jun. \*Baker Creek 738925E 4318579N.

***Lepidium virginicum*** L.

var. ***pubescens*** (Greene) Thell. (Plates 314a, b)

HAIRY VIRGINIA PEPPERWORT. Fairly frequent, below 9100 ft.; along roads, meadows, trail margins, open sagebrush flats and slopes. May-Jul. \*Cross Road T13N R70E S5, Baker Creek 736378E 4317140N.

**NASTURTIUM*****Nasturtium officinale*** R. Br. (Plate 315)

WATER-CRESS. Infrequent, below 7200 ft.; wet places; introduced from Europe. Apr-Jul. \*Snake Creek 745225E 4310694N, Lehman Creek 739414E 4321782N. [*Rorippa nasturtium-aquaticum* (L.) Hayek].

**PHYSARIA**

(including *Lesquerella*)

- 1 The fruit notched at apex, in age the inflated valves 11-21 mm wide. . . . . ***P. chambersii***  
 1 The fruit not notched at apex, the somewhat inflated valves 2.5-4.5 mm wide  
 2 Stems prostrate to decumbent  
 3 Fruit compressed-margined towards apex. . . . . ***P. occidentalis***  
 3 Fruit only slightly if at all compressed  
 4 The hairs ± compressed, giving the plants a smooth look. . . . . ***P. kingii***  
 4 The hairs ± erect, giving the plants a fuzzy look. . . . . ***P. Sp.***  
 2 Stems erect. . . . . ***P. pendula***

***Physaria* sp.**

Limited, 6300-6400 ft.; limestone gravel in pinyon-juniper woodland. These plants may be what was called *Lesquerella k.* (S. Wats.) S. Wats. ssp. *latifolia* (A. Nels.) Rollins & Shaw. May. Between Murphy Wash and Johns Wash 732 582E 42 87 500N Clifton 43965.

***Physaria chambersii*** Roll. (Plates 316a, b, c)

CHAMBER'S DOUBLE BLADDERPOD. Fairly frequent, below 10600 ft.; rocky slopes above desert shrubland. May-Jul. \*Murphy Wash T12N R68E S35, Snake Creek 743079E 4311400N, †North Fork Big Wash 742 956E 43 08 341N Clifton, Chalk Spring 738 254E 43 57 820N.

***Physaria kingii*** (S. Wats.) O' Kane & Al-Shehbaz

var. ***parvifolia*** (Maguire & A. H. Holmgren) S. L. Welsh (Plates 317a, b, c)

SMALL-LEAVED KING'S BLADDERPOD. Frequent, 9500-11500 ft.; gravelly ridges and slopes. Jun-early Aug. †Highland Ridge 734 750E 43 06 771N, Divide between South Fork Baker Creek and Timber Creek 737 789 43 15 143. [*Lesquerella k.*

(S. Wats.) S. Wats. ssp. *latifolia* (A. Nels.) Rollins & Shaw].

***Physaria occidentalis*** (S. Wats.) O' Kane & Al-Shehbaz

var. *cinerascens* (Maguire & Holmgren) S. L. Welsh

WESTERN BLADDERPOD. Infrequent, below 9000 ft.; gravelly slopes. Jun-Aug. Lincoln and Pole Canyons. [*Lesquerella o.* (S. Wats.) S. Wats. var. *c.* Maguire & Holmgren].

***Physaria pendula*** (Rollins) O' Kane & Al-Shehbaz (Plates 318a, b)

DROOPING FRUIT BLADDERPOD. Local, below 7000 ft.; fans, gravelly slopes, most often on limestone. In the area of the type there are plants that have the pedicels straight, erect ascending; straight and divaricate; descending and trying to be sigmoid; some of the lower are curved downward and back up the stem. The fruit is pointed up, straight out or straight down. In other places this taxon seems to behave quite well. Type is from Johns Wash T10N R68E S26. May-Jun. †between Murphy Wash and Johns Wash 732 582E 42 87 500N Clifton 43964, \*between Murphy Wash and Johns Wash 733 430E 42 86 712N Clifton 43966. [*Lesquerella p.* Rollins].

### RORIPPA

- 1 Flowers white; cauline leaves pinnate with distinct lateral leaflets. . . . . see *Nasturtium*
- 1 Flowers yellow; cauline leaves lacking distinct lateral leaflets, may be deeply lobed
- 2 Petals 3-5 mm long; plants spreading by long slender rhizomes. . . . . ***R. sinuata***
- 2 Petals mostly less than 2 mm long; plants tap-rooted annuals or perennials
- 3 Plants strongly perennial from a simple or most often from a branched caudex; petals a little longer than the sepals; the filaments of the stamens not much longer than the petals. . . . . ***R. alpina***
- 3 Plants annual to a short-lived perennial; petals shorter than the sepals; filaments of the stamens quite exerted
- 4 Fruit minutely papillate. . . . . ***R. tenerrima***
- 4 Fruit glabrous. . . . . *R. curvipes*

***Rorippa alpina*** (S. Wats.) Rydb.

ALPINE YELLOW CRESS. Limited, about 10400 ft.; lake shores. These plants are out of their normal range, central Utah is the closest. Late Jul-Aug. †Stella Lake 732 277E 43 20 654N Clifton 38395

***Rorippa curvipes*** Greene

BLUNT-FRUITED YELLOW CRESS. Widely scattered, below 10500 ft.; along streams and drying lake shores. The only difference between *R. sphaerocarpa* and *R. curvipes* is the shape of the fruit, which shape seems to be found on the same plant as at Dead Lake. There are places where these plants seem to keep their identity. Our plants used to be called *R. obtusa*, but it has vesicular trichomes on the lower stem and leaves and has been put in synonymy under *R. teres* which is the older name and is in the eastern US. Jun-Aug. \*Dead Lake T12N R69E S6, \*Lehman Creek T13N R68E S11, †Lehman Creek 739 414E 43 21 868N.

***Rorippa sinuata*** (Nutt.) A.S. Hitchc. (Plates 319a, b, c)

SPREADING YELLOW CRESS. Limited, about 5780 ft.; bottom of gravel extraction pit. Late Apr-May. \*The Cedars 722 325E 43 13 560N †Clifton 52120, †Baking Powder Flat 722610E 4301628N Clifton 45653.

***Rorippa tenerrima*** Greene (Plates 320a, b, c)

LOW or MODOC YELLOWCRESS. below 8500 ft.; drying mud along shores of small ponds. May-Jun. \*Lake Creek 759 975E 43 06 775N Clifton 52158.

### SCHOENOCRAMBE

***Schoenocrambe linifolia*** (Nutt.) Greene

SLENDER-LEAF REED MUSTARD. Fairly frequent, 7000-9500 ft., North Snake Range, below 8800 ft.; on slopes in gravelly soil. May-Jul. Chalk Spring 738 254E 43 57 820N, Eightmile Spring 733860E 4363380N (NAD 83), \*Dry Canyon 733700E 4361500N Clifton 48902.

### SISYMBRIUM

***Sisymbrium altissimum*** L. (Plates 321a, b)

TUMBLE MUSTARD. Fairly frequent, below 7000 ft.; along margins of roads, fields, disturbed places, often invading native habitat; introduced from Europe. The flowers often fade white as the photo shows. Late Apr-Sep. \*Highway 894 T13N R67E S23.

## SMELOWSKIA

*Smelowskia calycina* (Steph.) Ledeb.

var. *americana* (Regel & Herder) Drury & Roll. (Plates 322a, b)

ALPINE SMELOWSKIA. Fairly frequent, 10000-11500 ft.; rocky slopes. May-Aug. \*above Williams Canyon T13N R68E S35.

## STANLEYA

*Stanleya pinnata* (Pursh) Britt. (Plate 323)

PRINCE'S PLUME. Widely scattered at low elevations; valley slopes and floors. North Fox Well 716 667E 43 03 179N.

## STREPTANTHELLA

*Streptanthella longirostris* (S. Wats.) Rydb. (Plates 324a, b)

STREPTANTHELLA. Infrequent, 5200-6000 ft.: low sage or shadscale scrub and sometimes in mixed chenopod scrub. Late Apr-May. \*Baker T13N R70E S16.

## STREPTANTHUS Jewelflower, Twistflower

*Streptanthus cordatus* Nutt.

var. *cordatus* (Plates 325a, b, c)

HART-LEAVED JEWELFLOWER or TWISTFLOWER. Frequent, below 11000 ft.; rocky slopes. May-Jul. !Baker Creek Road T13N R69E S15, Strawberry Creek 7360 ft. Raymond Jandl.

## STRIGOSELLA

*Strigosella africana* (L.) Botsch. (Plate 330)

AFRICAN MALCOLMIA. Locally frequent, below 7200 ft.; along margins of roads; introduced from the Mediterranean. May-Jul. \*Grub Gulch T14N R68E S5, Coyote Canyon 742400E 4369655N. [*Malcolmia a.* (L.) R. Br.]

## THELYPODIUM

**Note:** The two genera, *Thelypodium* and *Thelypodopsis* are separated by base chromosome number of 11 and a slightly bilobed stigma for the latter and base chromosome number of 13 and an entire stigma for the former. You need mature fruit to separate these two genera and it is often hard to see the bilobed apex. In this treatment they are put into *Thelypodium* for convenience sake.

1 Stem leaves auriculate

2 The longest stem leaves not much over 15 mm long. . . . . *T. vermicularis*

2 The longest stem leaves over 15 mm long

3 Plants strong perennial with numerous old leaf bases. . . . . *T. flexuosum*

3 Plants biannual to weak perennials, lacking old leaf bases. . . . . *T. sagittatum*

1 Stem leaves not auriculate. . . . . *T. integrifolium*

*Thelypodium flexuosum* Robins. (Plates 326a, b, c)

SPREADING THELYPODY. Fairly Frequent, 5450-5800 ft.; valley bottoms and slight slopes in greasewood scrub. Late Apr-May. †The Cedars 723 809E 43 12 600N Clifton 40952, \*Hamlin Valley T10N R70E S24

*Thelypodium integrifolium* (T. & G.) Endl.

var. *complanatum* (Al-Shehbaz) Welsh (Plates 327a, b)

ENTIRE-LEAVED THELYPODY. Local, below 8000 ft. Jun-Sep. !Willow Patch Springs T15N R68E S36, Strawberry Creek T14N R69E S20, †Snake Creek 749 627 43 11 434, Caine Spring 755 130E 43 36 005N Clifton 47294.

*Thelypodium sagittatum* (Nutt.) Endl. ex Walp.

var. *ovalifolium* (Rydb.) Walsh & Reveal (Plates 328a, b, c, d)

SLENDER THELYPODY. Local in Spring Valley, 5600-5800 ft.; open subalkaline meadows. May-Jun. †Shoshone Ponds 723 496E 43 12 590N Clifton 43921, \*Spring Valley 722 980E 43 35 700N Clifton 51267. [ssp. *ovalifolium* (Rydb.) Al-

Shehbaz].

*Thelypodium vermicularis* (Welsh & Reveal) G. Clifton comb. nov. (Plates 329a, b, c)

GREAT BASIN THELYPODY. Local in Spring Valley, 5600-5800 ft.; margins of wet meadows, often in shade of junipers to open subalkaline flats. This taxon looks like the preceding, but the flowers are different. May-Jul. \*†The Cedars 723 805E 43 12 692N Clifton 43911, Spring Valley 718 483 43 38 082 Clifton 45636. [*Thelypodopsis* v. (Welsh & Reveal) Rollins].

#### TURRITIS

*Turritis glabra* L. (Plates 331a, b, c, d)

TOWER-MUSTARD. Infrequent, below 8200 ft.; shaded canyons, open forest, openings in forest, sometimes in disturbed places. The fruit is enough different to separate this from *Arabis*. Mid Apr-Jul: \*Lehman Creek 739 562E 43 21 906N Clifton 43042, †Timber Creek 738660E 4317380N Clifton 48848. [*Arabis glabra* (L.) Benth.].

Plates 228a-232c



Plate 228a *Mahonia repens*



Plate 228b



Plate 229 *Mahonia fremontii*



Plate 230 *Betula occidentalis*



Plate 231a *Allocarya cusickii*



Plate 232a *Allocarya hispidula*



Plate 231b



Plate 231c



Plate 232b



Plate 232c

Plates 233-238



Plate 233 *Allocarya salsus*



Plate 234 *Amsinckia intermedia*



Plate 235a *Amsinckia tessellata*



Plate 235b



Plate 236a *Cryptantha ambigua*



Plate 236b



Plate 237b



Plate 237c



Plate 237a *Cryptantha barbigerata*



Plate 238 *Cryptantha circumscissa*

Plates 239a-244c



Plate 239a *Cryptantha gracilis*



Plate 239b



Plate 239c



Plate 240a *Cryptantha pterocarya*



Plate 240b



Plate 241a *Cryptantha torreyi*



Plate 242 *Cryptantha recurvata*



Plate 241b



Plate 243 *Cryptantha watsonii*



Plate 244b



Plate 244c



Plate 244a *Cynoglossum officinale*

Plates 245a-251a



Plate 245a *Hackelia floribunda*



Plate 245b



Plate 246a *Hackelia micrantha*



Plate 246b



Plate 247a *Hackelia patens*



Plate 247b



Plate 248 *Lappula redowskii*  
var. *cupulata*



Plate 249 *Lappula redowskii*  
var. *desertorum*



Plate 250a *Lappula redowskii*



Plate 250b



Plate 251a *Lithospermum incisum*

Plates 251b-255b



Plate 251b



Plate 252 *Lithospermum ruderales*



Plate 253a *Mertensia ciliata*



Plate 253b



Plate 253c



Plate 254c



Plate 254a *Mertensia franciscana*



Plate 254b & 255b



Plate 255a *Mertensia 'glauca'*

Plates 256a-261b



Plate 256a *Mertensia oblongifolia*



Plate 256b



Plate 256c



Plate 257a *Oreocarya cinerea* var. *abortiva*



Plate 257b



Plate 257c



Plate 258 *Oreocarya compacta*



Plate 261a *Oreocarya flavoculata*



Plate 259 *Oreocarya confertiflora*



Plate 260 *Oreocarya depressa*



Plate 261b

Plates 261c-272a



Plate 261c



Plate 262a *Oreocarya humilis*



Plate 262b



Plate 262c



Plate 263 *Oreocarya interrupta*



Plate 264b



Plate 264a *Oreocarya rugulosa*



Plate 264c



Plate 265b



Plate 265a *Oreocarya 'scorpioides*



Plate 265c



Plate 266a *Oreocarya welshii*

Plates 266b-271b



Plate 266b



Plate 266c



Plate 268a *Alyssum desertorum*



Plate 268b



Plate 269b



Plate 267 *Tiquilia nuttallii*



Plate 269a *Alyssum simplex*



Plate 270 cross



Plate 271a *Arabis drummondii*



Plate 271b

Plates 271c-274b



Plate 271c



Plate 272a *Arabis eschscholtziana*



Plate 272b



Plate 273b



Plate 272c



Plate 273a *Arabis grahamii*



Plate 273c



Plate 274a *Arabis lemmonii*



Plate 274b

Plates 274c-278b



Plate 274c



Plate 275b



Plate 276 *Arabis microphylla*



Plate 275a *Arabis linclonensis*



Plate 277a *Arabis pendulina*



Plate 277b



Plate 277c



Plate 277d



Plate 278a *Arabis pendulocarpa*



Plate 278b

Plates 279a-282c



Plate 279a *Arabis retrofracta*



Plate 279b

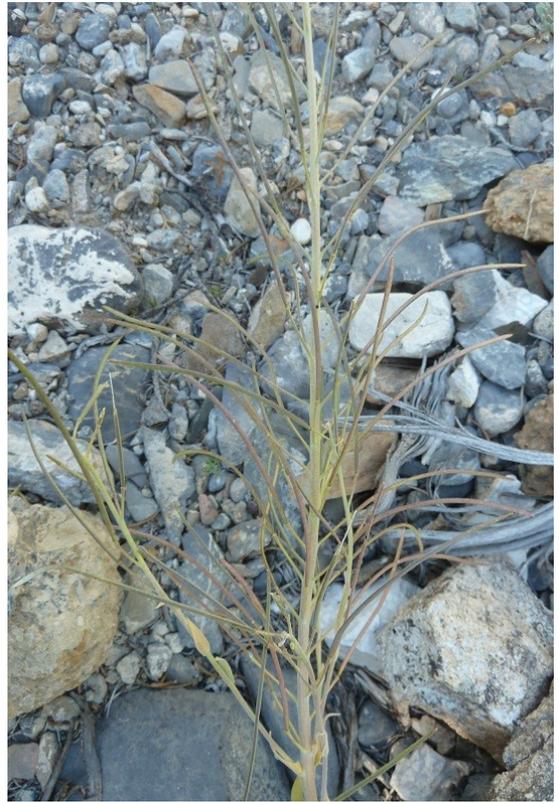


Plate 280a *Arabis shockleyi*



Plate 279c



Plate 281a *Barbarea orthoceras*



Plate 281b

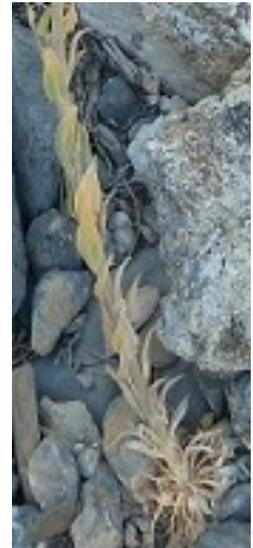


Plate 280b



Plate 282a *Brassica elongata*



Plate 282b



Plate 282c

Plates 283a-286a



Plate 283a *Camelina microcarpa*



Plate 283b



Plate 284a *Capsella bursa-pastoris*



Plate 283c



Plate 284b



Plate 285a *Cardamine breweri*



Plate 285b



Plate 286a *Cardamine cordifolia*

Plates 286b-290b



Plate 286b



Plate 286c



Plate 287b



Plate 287a *Cardaria draba* var. *repens*



Plate 288a *Caulanthus crassicaulis*



Plate 288b



Plate 290a *Caulanthus pilosus*



Plate 289 *Caulanthus crassicaulis* var. *glaber*



Plate 288c



Plate 290b

Plates 291a-295c



Plate 291a *Chorispora tenella*



Plate 291b



Plate 292a *Descurainia californica*



Plate 292b



Plate 294 *Descurainia paradisa*



Plate 293a *Descurainia incisa*



Plate 293b



Plate 295a *Descurainia pinnata*



Plate 295b



Plate 295c

Plates 296a-301b



Plate 296a *Descurainia sophia*



Plate 296b



Plate 297a *Draba albertina*



Plate 297b



Plate 298a *Draba aurea*



Plate 298b



Plate 299 *Draba cana*



Plate 300 *Draba cuneifolia*



Plate 301a *Draba nemorosa*



Plate 301b

Plates 301c, 308-305



Plate 301c



Plate 302a *Draba oligosperma*



Plate 302b



Plate 303a *Draba pedicellata* var. *wheelerensis*



Plate 304b



Plate 303b



Plate 304a *Draba serpentina*



Plate 305 *Erysimum asperum*



Plate 304c

Plates 306-310b



Plate 306 *Erysimum repandum*



Plate 307 *Hesperis matronalis*



Plate 308a *Hornungia procumbens*



Plate 308b



Plate 310a *Lepidium densiflorum*



Plate 309a *Lepidium campestre*



Plate 309b

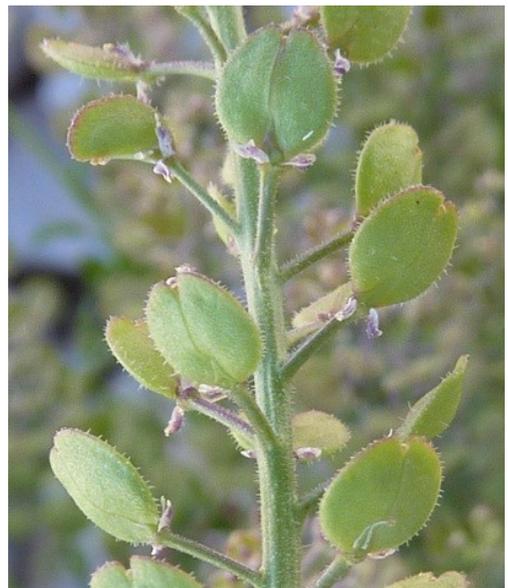


Plate 310b

Plates311a-314c



Plate 311a *Lepidium lasiocarpum*



Plate 311b



Plate 312a *Lepidium montanum*



Plate 312b



Plate 313 *Lepidium perfoliatum*



Plate 314a *Lepidium virginicum*  
var. *pubescens*



Plate 314b



Plate 314c

Plates 315-319b



Plate 315 *Nasturtium officinale*



Plate 316a *Physaria chambersii*



Plate 316b



Plate 316c



Plate 317b



Plate 317a *Physaria kingii* var. *parvifolia*



Plate 317c



Plate 319a *Rorippa sinuata*



Plate 318a *Physaria pendula*



Plate 318b



Plate 319b

Plates 319c-322b



Plate 319c



Plate 320a *Rorippa tenerrima*



Plate 320b



Plate 320c



Plate 321b



Plate 322b



Plate 31a *Sisymbrium altissimum*



Plate 322a *Smelowskia calycina* var. *americana*

Plates 323-326c



Plate 323 *Stanleya pinnata*



Plate 324a *Streptanthella longirostris*



Plate 324b



Plate 325c



Plate 325a *Streptanthus cordatus*



Plate 325b



Plate 326a *Thelypodium flexuosum*



Plate 326b



Plate 326c

Plates 327a-329c



Plate 327a *Thelypodium integrifolium*  
var. *complantum*



Plate 327b



Plate 328c



Plate 328a *Thelypodium sagittatum* var. *ovalifolium*



Plate 328b



Plate 328d



Plate 329a *Thelypodium vermicularis*



Plate 329b



Plate 329c

Plates 330-331d



Plate 330 *Strigosella africana*



Plate 331a *Turritis glabra*



Plate 331b



Plate 331c



Plate 331d

## CACTACEAE Cactus Family

- 1 Plants lacking joints; areolae lacking glochids (hair-like barbed spines) may be hairy
  - 2 At least some of the areolae bearing hooked spines; immature plants with the spines staying pubescent for a number of years. . . . . *Sclerocactus*
  - 2 Areolae with none of the spines hooked; immature plants not staying pubescent very long or not at all
    - 3 Flowers born laterally below the apex; hypanthium bearing spines; flowers red, red-orange or purple-lavender . . . . . *Echinocereus*
    - 3 Flowers born on the apex of the plant; hypanthium spineless; flowers white to yellow, pale or rose-pink, violet; plants usually not obviously mound-forming, may be a few plants, but not making large mounds
      - 4 Tubercles generally with a groove on one side; flower and fruit separate from the spine bearing tubercles; flower reddish. . . . . *Coryphantha*
      - 4 Tubercles not grooved on one side; flowers and fruit connected with the spine bearing tubercles, thus appearing to have a cluster of spines at the base of the flower and fruit; flowers white to yellow, or pale pinkish. . . . . *Pediocactus*
- 1 Plants having joints; areolae having glochids
  - 5 Joints round in cross section and clavate. . . . . *Grusonia*
  - 5 Joints flat. . . . . *Opuntia*

### CORYPHANTHA

#### *Coryphantha vivipara* (Nutt.) Britt. & Rose (Plate 354)

ARIZONA FOXTAIL CACTUS. Infrequent, below 7000 ft.; on open limestone rocky slopes and flats, gravelly slopes. All varieties have been submersed under the species in Flora of North America 2003. May-Jun. \*Cross Road T13N R70E S5, Devils Gate Canyon 744556E 4372346N. [var. *arizonica* (Engelm.) W. Marshall].

### ECHINOCEREUS Hedgehog Cactus

- 1 Petaloids scarlet or red; mature stems with the vegetative areoles bearing white felt or cobwebby hairs. . . . . *E. triglochidiatus*
- 1 Petaloids purplish to magenta; mature stems with the vegetative areoles lacking white felt or cobwebby hairs (felt of young areoles persistent 1-2 years. . . . . *E. engelmannii*

#### *Echinocereus engelmannii* (Parr. ex Engelm.) Lam. (Plate 355)

NORTHERN SAINTS CACTUS. Infrequent, 5900-5500 ft.: rocky slopes. Jun. \*Hamlin Valley 749 530E 42 90 422N Clifton 45157, between Shingle and Pine Creek 725346E 4318440N Clifton 45670.

#### *Echinocereus triglochidiatus* Engelm. (Plate 346)

CLARET-CUP CACTUS. Rare, below 6500 ft.; low exposed slabs of limestone. If one wishes, these could be called *E. mojaviensis* (Engelm. & Bigel.) Rümpler. Late Apr-May. \*†between Murphy Wash and Johns Wash 732 287E 42 87 868N Clifton 43961, Snake Creek 753 780E 43 11 636N.

### GRUSONIA

#### *Grusonia pulchella* (Engelm.) H. Robins.

SAND CHOLLA. Limited, below 6000; sandy or rocky openings in scrub. May-Jun. \*Cross Road T13N R70E S5, †Hamlin Valley 749 490E 42 90 928N Clifton 45155. [*Opuntia p.* Engelm.].

### OPUNTIA Prickly-pear

#### *Opuntia polyacantha* Haw. Complex (Plates 357a, b)

STARVATION PRICKLYPEAR. Frequent, below 10100 ft.; rocky places in pinyon-juniper, sagebrush and mountain mahogany. There are trends within this group of polymorphic plants, but there are no real geographical boundaries. Some flowers are self pollinated while others outcross. Even the plants within this range are not consentient. Apr-Aug. !Baker Creek T38° 58' 35.2" 114° 14' 45" Clifton 11443, \*Cross Road T13N R70E S5, Decathon Canyon 736 405E 43 01 820N Clifton 45251, Horse Heaven 742 630E 43 14 186N Clifton 45299, Chalk Spring 738 254E 43 57 820N. [var. *hystricina* (Engelm. & Bigel.) Parfitt, var. *rufispina* (Engelm. & Bigel.) L. Benson].

**PEDIOCACTUS*****Pediocactus simpsonii*** (Engelm.) Britt. & Rose (Plates 358a, b)

SIMPSON'S FOOTCACTUS. Fairly frequent, below 9500 ft.; openings in sagebrush, on steep slopes and flats. These plants may be a new species as they look different from others. Apr-May. !Lehman Creek T13N R69E S8, Devils Gate Canyon 744630E 4372297N.

**SCLEROCACTUS** Fishhook Cactus***Sclerocactus pubispinus*** (Engelm.) L. Benson

BASIN FISHHOOK. Widely scattered in the Baker area and on the south end of the range, below 6500 ft.; rocky slopes. These plants only reach 0.6 dm tall and up to about 1 dm wide, they are light colored, thus blending with their habitat. May-Jun. \*The Troughs 738 545E 42 79 185N Clifton 43879, †Branch of Weaver Creek 736 272E 43 32 278N Clifton 44006.

**CAMPANULACEAE****DOWNINGIA*****Downingia laeta*** (Greene) Greene

GREAT BASIN CALICO-FLOWER. Limited, about 5760 ft.; vernal depressions. May-early Jun. †Shoshone Ponds 723378 4312407 Clifton 45641, north of North Millick Spring 725220E 4356050 (NAD 83) Clifton 47189.

**CANNABACEAE** Hemp Family**HUMULUS*****Humulus lupulus*** L.

var. *neomexicanus* (A. Nels.) Cockerell (Plates 359a, b)

NEW MEXICO HOP. Limited, about 6820 ft.; climbing on shrubs in riparian. \*†South Fork Lexington Creek 746064E 4304090N Clifton 41028. [*H. americanus* Nutt. in part].

**CAPRIFOLIACEAE** Honeysuckle Family

1. Leaves simple..... *Symphoricarpos*  
1 Leaves compound..... *Sambucus*

**SAMBUCUS** Elderberry

- 1 Inflorescence a flat-topped cluster of flowers; berry blue..... *S. caerulea*  
1 Inflorescence a dome-shaped cluster of flowers; berry red..... *S. racemosa*

***Sambucus caerulea*** Raf. (Plates 260a, b, c)

BLUE ELDERBERRY. Widely scattered, below 9000 ft.; dry canyons and slopes, meadow margins. This taxon has been made a subspecies of *Sambucus nigra* by some. Jun-Aug. †Baker Creek 738 951 43 18 344, Decathon Canyon 736 405E 43 01 820N Clifton 45253.

***Sambucus racemosa*** L. (Plate 361)

RED ELDERBERRY. Limited, 9000-10500 ft.; mesic open or wooded mountain slopes, streambanks. Variety *microbotrys* is identical to the larger forms that are coastal. The other named variety is the purple-black fruited variety. It can only be identified late in the season. May-Jul. \*Baker Creek 734 228E 43 15 500N. [var. *microbotrys* (Rydb.) Kearney & Peebles]

**SYMPHORICARPOS** Snowberry

- 1 Corolla tube narrow, ± tubular, pinkish, lobes spreading..... *S. longiflorus*  
1 Corolla tube bell-shaped, whitish, lobes ± erect..... *S. oreophilus*

***Symphoricarpos longiflorus*** A. Gray (Plate 362)

DESERT SNOWBERRY. \*Grub Gulch 727 580E 43 30 976N Clifton 45214, Snake Creek Spring 750400E 43 10460N, Marble Wash 743776E 4370184N, ridge between North Fork Big Wash and Snake Creek 741550E 43 10016.

***Symphoricarpos rotundifolius*** A. Gray (Plate 363)

MOUNTAIN SNOWBERRY. Frequent, below 9,000 ft.; open slopes or in woods. There are several named varieties that are often hard to distinguish, they are most likely just a contiguuum of variation within a single species.. Jun-early Jul. \*Gray Cliff T13N R69E SW22, Chalk Spring 738 254E 43 57 820N. [*S. oreophilus* A. Gray and var. *utahensis* (Rydb.) A. Nels.]

**CARYOPHYLLACEAE** Pink Family

**Note:** There are several families within this group of plants. The plants that have tubular flowers belong in this family. The ones with no tube belong in Alsinaeae

- 1 Calyx lobes fused for some distance forming a tube. . . . . *Silene*
- 1 Calyx lobes ± free to base
  - 3 Plants with some of the leaves over 3 mm wide, if narrower, than petals deeply cleft, rarely lacking
    - 4 Herbage with some glandular pubescence
      - 5 The longer leaves 30 mm or longer. . . . . *Pseudostellaria*
      - 5 The longer leaves rarely longer than 15 mm. . . . . *Cerastium*
    - 4 Herbage mostly glabrous, rarely pubescent at base of plant. . . . . *Stellaria*
  - 3 Plants with most of the leaves under 2 mm wide
    - 6 Stipules prominent. . . . . *Paronychia*
    - 6 Stipules lacking
      - 7 Flowers congested at the end of the inflorescence branches. . . . . *Eremogone*
      - 7 Flowers single at the end of the inflorescence branches
        - 8 Plants of moist places; pedicels recurving in fruit. . . . . *Sagina*
        - 8 Plants of dry gravelly or rocky slopes; pedicels not curved . . . . . *Minuartia*

**CERASTIUM** Mouse-ear Chickweed

- 1 Petals exceeding sepals by 1.2 mm or more. . . . . *C. beeringianum*
- 1 Petals not exceeding the sepals by more than 0.5 mm, if at all. . . . . *C. fontanum*

***Cerastium beeringianum*** Cham. & Schldl. (Plates 364a, b)

ALPINE MOUSE-EAR CHICKWEED. Infrequent, above 11000 ft.; alpine turf, rocky ground and gravelly slopes. Jul-Aug. \*Mount Washington T12N R68E S11, †Pyramid Peak 733 783E. 43 14 750N Clifton 40998, †Pyramid Peak 733 795E 43 14 706N Clifton 11740, †Highland Ridge 735 264E 43 06 138N Clifton 45270. [var. *capillare* Fern. & Wieg.]

***Cerastium fontanum*** Bamug.

ssp. *vulgare* (Hartman) Greuter & Burdet (Plate 365)

LARGE MOUSE-EAR CHICKWEED. Fairly frequent, below 8500 ft.; meadows, stream margins, damp woods; introduced from Europe. May-Aug. Baker Creek T13N R69E S14.

**EREMOGONE** Sandwort

- 1 Flowers single; petals fairly deeply lobed. . . . . *A. kingii*
- 1 Flower congested; petals not much lobed. . . . . *A. congesta*

***Eremogone congesta*** (Nutt.) Ikonnikov

var. *simulans* (Maguire) R. L. Hartman & Rabeler (Plate 366)

WHEELER PEAK CAPITATE SANDWORT. Frequent, 7000-11500 ft.; open, rocky slopes. Jul-Aug. Stella Lake 732 188E 43 20 413N, †Head of Lucky Boy Canyon 727 970E 43 29 680N Clifton 45208, \*Wheeler Peak Road 736 270E 43 22 595N Clifton 48881. [*Arenaria c.* Nutt. var. *wheelerensis* Maguire]

***Eremogone kingii*** (S. Wats.) Ikonnikov

var. *kingii* (Plate 368)

KINGS SANDWORT. Fairly frequent, 6000-9400 ft.; rocky slopes in openings in pinyon-juniper woodland. †between Murphy Wash and Johns Wash 733 430E 42 86 712N Clifton 43966, †branch of Decathlon Canyon 738 463 43 00 250 Clifton 45247,

Dry Canyon 733 700E 43 61 500N Clifton 48903, Saddle between Arch Canyon and Big Spring Wash 740 515E 43 02 012N (NAD 83). [*Arenaria k. S. Wats.*].

#### MINUARTIA Sandwort

- 1 Sepal tip narrowly rounded, margins incurved, hood-like. . . . . *M. obtusiloba*
- 1 Sepal tip acute to acuminate, margins not incurved
  - 2 Plants usually trailing; rhizomes elongate; leaves usually recurved. . . . . *M. nuttallii*
  - 2 Plants caespitose; leaves usually straight. . . . . *M. rubella*

*Minuartia nuttallii* (Pax) Briq.

var. *fragilis* (Maguire & A. Holmgren) G. Clifton (Plates 367a, b)

FRAGILE SANDWORT. Infrequent, 10,000-11,500 ft.: limestone talus. Jul-Aug. \*Mount Washington T12N R68E S11, Lincoln Peak 734 409E 4 306 948N.

*Minuartia obtusiloba* (Rydb.) House

ALPINE SANDWORT. Infrequent, above 10,000 ft.; alpine turf and rocky slopes. This and the next almost look the same when looking down at them in the field. Jul-Aug. \*Stella Lake T13N R68E S11, †Highland Ridge 734 357E 43 07 856N Clifton 45276.

*Minuartia rubella* (Wahlenb.) Hiern (Plate 369)

MARBLE or REDDISH SANDWORT. Infrequent, 10000-11500 ft.; rocky ridges and slopes. Jul-Aug. \*above Stella Lake T13N R68E S11, †The Table 741 944E 43 52 615N (NAD 83) Clifton 47174, †Highland Ridge 734 750E 43 06 771N Clifton 38447.

#### PARONYCHIA

*Paronychia sessiliflora* Nutt. (Plates 370 a, b)

LOW NAILWORT. Infrequent, below 9500 ft., North Snake Range; open gravelly flats and slopes. Late Jun-Aug. West of Mud Spring 734 940E 43 56 040N (NAD 83) Clifton 47184

#### PSEUDOSTELLARIA False Starwort

*Pseudostellaria jamesiana* (Torr.) W. A. I. Weber & R. L. Hartman (Plate 371)

STICKY STARWORT. Frequent, 6000-9800 ft.; mesic woods, riparian, open slopes. May-Jul. Strawberry Creek T14N R68E S24.

#### SAGINA Pearlwort

*Sagina saginoides* (L.) Karst. (Plates 372a, b)

ARCTIC PEARLWORT. Fairly frequent, 6500-10400 ft.; moist to wet places. This is a vary small plant and often overlooked. May-Sep. \*Stella Lake T13N R68E S11.

#### SILENE Campion

- 1 Flowers purplish; plants alpine dwarfs. . . . . *S. acaulis*
- 1 Flowers whitish; plants not dwarfs
  - 2 Petals included or only slightly exerted
    - 3 Herbage lacking glandular hair. . . . . *S. nachlingerae*
    - 3 Herbage bearing glandular hairs. . . . . *S. drummondii*
  - 2 Petals well exerted from calyx
    - 4 Herbage with multicellular hairs; plants functionally dioecious. . . . . *S. menziesii*
    - 4 Herbage with short hair that is not cellular; plants monoecious. . . . . *S. douglasii*

*Silene acaulis* L. (Plates 373a, b)

MOSS CAMPION. Fairly frequent, above 11000 ft.; open rocky slopes. late Jun-Aug. \*above Johnson Lake T13N R68E S36, †Mount Washington 733 542E 43 10 723N Clifton 45283. [var. *subacaulescens* (F. Williams) Fern. & St. John].

*Silene douglasii* Hook.

var. *douglasii* (Plates 374a, b, c)

DOUGLAS' CAMPION. Fairly frequent, 8000-10800 ft.; open rocky slopes. May-Jul. Bald Mountain T13N R68E S2,

\*Wheeler Peak Road T13N R69E S6.

***Silene drummondii*** Hook.

var. *striata* (Rydb.) Bocquet (Plates 376a, b)

DRUMMOND'S CAMPION. Infrequent, 8000-11500 ft.; open rocky slopes, crevices on buffis. Jun-Aug. †Stella Lake 732 245E 43 20 437N Clifton 42993, †Baker Lake 38° 57' 17" 114° 18' 19" Clifton 11758. [*Lychnis d.* (Hook.) S. Wats.].

***Silene menziesii*** Hook. (Plates 375a, b)

MENZIES' CAMPION. Riparian, 7000-10000 ft. May-Aug. \*Baker Creek 740 414E 43 19 235N Clifton 40967.

***Silene nachlingerae*** Tiehm

NEVADA CAMPION. Widely scattered, 9000-11500 ft.; on limestone and sometimes on quartzite, open woods, cliffs, canyons. The only difference between this taxon and *S. invisa* of California is that it has no glandular hairs. This taxon, *S. invisa* and *S. drummondii* look the same visually except *S. drummondii* is often more robust. In the Egan Range this taxon gets below 7000 ft. and blooms in June. Jul-Sep. \*head of Lincoln Canyon T12N R68E S14, \*North Fork Big Wash 734 092E 43 09 413E Clifton 44561, †Decathlon Canyon 737 122E 43 00 880N Clifton 45230.

### STELLARIA Starwort

- 1 Petals lacking or shorter than the sepals by quite a bit
- 2 Inflorescence appearing leafy, cymose. . . . . *S. calycantha*
- 2 Inflorescence not appearing real leafy, subumbellate. . . . . *S. umbellata*
- 1 Petals well developed. . . . . *S. longipes*

***Stellaria calycantha*** (Ledeb.) Bong. (Plate 377)

NORTHERN STARWORT. Fairly frequent, 7000-10700 ft.; fairly wet places as meadows, streams, and springs. May-Aug. \*Lehman Creek T13N R68E S11, †Pyramid Peak 733 783E. 43 14 750N Clifton 40994, Pine Creek 729 204E 43 19 388N Clifton 45674.

***Stellaria longipes*** Goldie

- a Plants widely separated, taller. . . . . var. *longipes*
- a Plants tufted with numerous stems, shorter. . . . . var. *altocaulis*

var. *altocaulis* (Hultén) C. L. Hitchc. (Plates 378a, b)

GLAUCOUS STARWORT. Infrequent, 10000-12000 ft.; alpine turf close to drying rivulets. All persons who have worked with this group of plants have tried to separate them based on branching, pubescence, or green verses glaucous. But what needs to be look at throughout their range is the method of producing seed in relationship to the other characters that have been used. The plants that have glaucous leaves in this area don't even remotely look like the species. The method of flowering as addressed in the next taxon, doesn't seem to apply to this taxon. Jul-Aug. \*above Stella Lake T13N R68E S11, Pyramid Peak 733 783E. 43 14 750N Clifton 40991. [*S. monantha* Hultén]

var. *longipes* (Plate 379)

LONG-STALKED STARWORT. Frequent, 6000-9000 ft.; meadows, streams, and springs. This taxon has two flowering systems. One plant has broad petal lobes, has long stamens with red anthers that make pollen and 4 styles that are not exerted, the capsule is black. The other has narrow petal lobes, very short stamens, white anthers that appear not to make pollen, has 3 long exerted styles, also makes fruit. These booth have green leaves and a branching inflorescence. May-Aug. Baker Creek 738 611E 43 18 257N, \*Snake Creek 739 900E 43 11 600N Clifton 41030.

***Stellaria umbellata*** Karel. & Kir. (Plates 380a, b)

UMBEL-FLOWERED CHICKWEED. Fairly frequent, 9500-11000 ft.; moist places. There seems to be two different forms of this taxon. One has a very open inflorescence with long pedicels; when pressed the anthers are not obvious; sepals purplish with the central nerve raised. The other one has the inflorescence more compact; when pressed the anthers are obvious; sepals green and generally flat. Jul-Aug. \*above Stella Lake T13N R68E S11, †Highland Ridge Road 734 262E 43 08 977N, †Pyramid Peak 733 783E. 43 14 750N Clifton 40993.

### CHENOPODIACEAE Goosefoot Family

**Note:** This is a huge polymorphic family of numerous unlike plants that could easily be made in to a number of families.

- 1 Upper stems appear jointed; leaves scale-like. . . . . *Allenrolfea*
- 1 Upper stems not as above; leaves otherwise

- 2 Leaves sharp-pointed (prickly or not) or with a hair-like mucro and terete
  - 3 Leaves sharp-pointed (prickly or not), not terete
    - 4 Leaves prickly; wings of fruit wider than the body. . . . . *Salsola*
    - 4 Leaves sharp-pointed but not prickly; wings of fruit narrower than the body. . . . . *Corispermum*
  - 3 Leaves mucronate, terete; plants not a tumbleweed. . . . . *Halogeton*
- 2 Leaves not spine-tipped or with a hair-like mucro
  - 5 Herbage tomentose, bearing some branching hairs. . . . . *Krascheninnikovia*
  - 5 Herbage not as above, if bearing branched hairs, these mealy
    - 6 Plants shrubs or subshrubs
      - 7 Leaves linear, terete or semiterete
        - 8 Plants a small subshrub, not bearing spines. . . . . *Neokochia*
        - 8 Plants a much larger shrub, bearing spinescent branches. . . . . *Sarcobatus*
      - 7 Leaves not as above
        - 9 Twigs with conspicuous white lines running length wise; axillary buds present; mealy hairs often branched. . . *Grayia*
        - 9 Twigs the same color throughout; axillary buds lacking; lacking branched mealy hairs. . . . . *Atriplex*
    - 6 Plants herbaceous
      - 10 Herbage hairy
        - 11 Sepals cottony hairy; bracts of inflorescence hardly longer than the flowers. . . . . *Bassia*
        - 11 Sepals glabrous or with some hairs on apex; bracts of the inflorescence much longer than the flowers. . . . . *Kochia*
      - 10 Herbage glabrous or mealy
        - 12 Flowers enclosed in paired bracteoles, lacking sepals (very arbitrary). . . . . *Atriplex*
        - 12 Flowers having developed sepals, not enclosed in paired bracteoles
          - 13 Perianth lobes 1-3, rarely absent
            - 14 The ultimate branches filiform; leaves oblong. . . . . *Micromonolepis*
            - 14 The ultimate branches when present, thicker; leaves spatulate or narrowly triangular-lanceolate. . . . . *Monolepis*
          - 13 Perianth lobes 5; wall of fruit honey-combed to smooth. . . . . *Chenopodium*

#### ALLENROLFEA

*Allenrolfea occidentalis* (S. Wats.) Kuntze (Plate 381)

IODINE BUSH. Local, below 5500 ft; alkaline soil. Mid Jul-early Sep. \*Big Springs Creek 756 251E 42 94 920N, †Spring Creek 719 281E 43 18 043 Clifton 40944.

#### ATRIPLEX Saltbush

**Note:** *Atriplex gardneri* is a formidable complex of plants that is poorly understood. There are numerous forms, some have names and some don't. The fruiting bracteoles are often not a very good character as there can be different kinds on the same plant. The varieties are pure speculation on the part of various workers. The plants have been where they are at, since they were put there. In this treatment they are not recognized as varieties because they are not so.

- 1 Plants woody to only woody at the base (soft shrubs)
  - 2 Bracteoles with 4 lateral wings; plants 8-20 dm tall. . . . . *A. canescens*
  - 2 Bracteoles not obviously winged; plants 8 dm or less tall
    - 3 Plants spinescent; leaves orbiculate, to ovate, elliptic or oval. . . . . *A. confertifolia*
    - 3 Plants unarmed; leaves linear, oblong, oblanceolate, obovate-spatulate
      - 4 The flowering rachis strongly zig zagging; inflorescence more open. . . . . *A. bonnevillensis*
      - 4 The flowering rachis essentially straight; inflorescence very compact. . . . . *A. 'compacta'*
- 1 Plants annual
  - 5 Plants green, turning reddish in late season, only lightly scruffy. . . . . *A. dioica*
  - 5 Plants hardly green, densely scruffy
    - 6 Leaves mostly irregularly sinuate-dentate. . . . . *A. rosea*
    - 6 Leaves mostly entire, may be lobed near the base
      - 7 Fruiting bracteoles dentate only across their truncated summit. . . . . *A. truncata*
      - 7 Fruiting bracteoles otherwise. . . . . *A. argentea*

*Atriplex argentea* Nutt.

var. *argentea* (Plate 382)

SILVER SCALE. Infrequent, below 6600 ft.; road banks, valley floors, alkaline soil, often in disturbed places. Most plants have short-stalked and sessile fruiting bracts on the same plant. \*Highway 50 T15N R69E S31, †Coyote Canyon 742 400E 43 69 655N Clifton 48939.

*Atriplex bonnevillensis* C. A. Hanson (Plates 386a, b, c, d)

BONNEVILLE SALTBUUSH. Infrequent, limited to Snake Valley, below 5200 ft.; a component of chenopod scrub. These plants come the closest to this taxon. The description of the fruiting bracteoles don't really fit the plants that grow here, however since they are so variable, the description may be inaccurate. Jul-Aug. \*Marble Wash 241 984E 43 65 275N Clifton 48967, Caine Spring 755 070E 43 35 940N Clifton 47293.

*Atriplex canescens* (Pursh) Nutt.

var. *canescens* (Plates 383a, b)

WESTERN FOUR-WINGED SALTBUUSH. Frequent, below 7500 ft.; well drained soil, openings in pinyon-juniper, sandy areas in sagebrush, and in saline soils. May-Jun. \*Spring Valley T13N R67E S33, Baker Creek T13N R69E S13, Lehman Caves 741 007E 43 20 777N. [var. *occidentalis* (Torr. & Frém.) Welsh & Stutz].

*Atriplex* 'compacta' (Plates 387a, b, c, d)

DENSE-FLOWERED SALTBUUSH. Rare, limited to Snake Valley; a component of chenopod scrub. These plants sometimes grow in the same area as *A. bonnevillensis*. Jul-Aug. †Caine Spring 755 070E 43 35 940N Clifton 47292.

*Atriplex confertifolia* (Torr. & Frém.) S. Wats. (Plates 384a, b)

SHADSCALE. Frequent, below 7200 ft.; desert scrub, sometimes up into the lower pinyon-juniper. Apr-May. \*Spring Valley T13N R67E S33, Baker Creek T13N R69E S13, Coyote Canyon 742400E 4369655N.

*Atriplex dioica* Raf. (Plates 385a, b)

THICKLEAF ORACH. Infrequent, below 6000 ft. moist to wet places. Late int the season the herbage turns reddish. Sep-Oct. †Lake Creek 239 834E 43 06 428N Clifton 44995. [*A. subspicata* (Nutt.) Rydb.].

*Atriplex rosea* L. (Plates 388a, b)

RED SALTBUUSH, TUMBLING ORACH. Infrequent, below 6000 ft.; along roads and other waste places; introduced from Eurasia. Jul-Sep. \*South Highland Road T11N R67E S35.

*Atriplex truncata* (Torr.) A. Gray (Plates 389a, b)

WEDGE ORACH. Infrequent, below 6000 ft.; alkaline flats and slopes. †The Cedars 723 809E 43 12 600N Clifton 40960.

## BASSIA

*Bassia hyssopifolia* (Pallas) Kuntze (Plate 390)

HYSSOP-LEAVED BASSIA, FOUR-HORNED SMOTHERWEED. Frequent, below 7000 ft.; disturbed alkaline soils, along roads and other waste places; introduced from Europe. Jun-Sep. \*Spring Valley T13N R67E S33, Hamlin Valley T10N R70E S1, Lehman Caves 741 011E 4320 718N.

## CHENOPODIUM Goosefoot

- 1 Seeds with some or all vertical
- 2 Leaves greenish on both surfaces
  - 3 Inflorescence axillary branched and often branches again branched
    - 4 The sepal lobes very short, broadly lanceolate, generally acute, basically disintegrating from around the seed ..... *C. chenopodioides*
    - 4 The sepal lobes longer, oblong (these may sometimes be slightly acute) to oval, sometimes so broadly oval that they will rupture as the seed matures. .... *C. rubrum*
  - 3 Inflorescence rarely axillary branched, mostly each branch elongate. .... *C. foliosum*
- 2 Leaves pale-green on upper surface, lower surface grayish and mealy. .... *C. glaucum*
- 1 Seeds usually horizontal
  - 5 Leaves cordate or sub-cordate, bright green, thin, glabrous; sepals not keeled. .... *C. simplex*
  - 5 Leaves not as above; sepals often keeled
    - 6 Leaf margins entire, may be obscurely hastate-lobed
      - 7 Leaves subtending each branch much larger than rest of the leaves, these over 3 times longer than wide. . *C. pratericola*
      - 7 Leaves all about the same size, the longest leaves less than 3 times longer than wide
      - 8 Lower leaf blades 3-veined from bases, the lateral veins not as obvious as the center vein
        - 9 Leaf blade usually over 1.5 times longer than wide.. .... *C. atrovirens*
        - 9 Leaf blade usually less than 1.5 times longer than wide

- 10 Fruit top visible between calyx lobes; leaf blade thin ..... *C. fremontii*  
 10 Fruit top hidden; leaf blade ± leathery..... *C. incanum*  
 8 Lower leaf blades 1-veined from base..... *C. leptophyllum*  
 6 Leaf margins dentate. .... *C. berlandieri*

**Note:** Mature fruit is often needed to identify some of these taxa. The nomenclature is often very hard to determine which plants belong to which species, as no books agrees with each other.

***Chenopodium atrovirens*** Rydb. (Plates 391a, b)

DARK GOOSEFOOT. Infrequent, below 9600 ft.; open slopes, sometimes waste places. May-Aug. \*branch of North Fork Big Wash 735 740E 43 07 570N Clifton 44548.

***Chenopodium berlandieri*** Moq.-Tandon

var. *zschackei* (Murr) Murr (Plates 392a, b)

PIGWEED. Frequent, below 8000 ft. waste places. May-Sep. \*Dry Gulch T14N R67E S12, †Minerva 726 787E 43 00 254N Clifton 44570.

***Chenopodium chenopodioides*** (L.) Aellen

CHENOPOD-LIKE GOOSEFOOT. Limited, below 5500 ft.; river margins. mid June-Jul. †Lake Creek 239 834E 43 06 428N Clifton 44993.

***Chenopodium fremontii*** S. Wats. (Plates 393a, b, c)

FREMONT'S GOOSEFOOT. Fairly frequent, below 7500 ft.; open slopes in gravel or sandy soils, upper dry margins of marshes. Jun-Sep. \*Snake Creek T12N R69E S9, \*Highway 50 T15N R69E S31, †Baker Creek 738 344E 43 18 742N, Lake Creek 239 834E 43 06 428N Clifton 44990, Marble Wash 743776E 4370184N.

***Chenopodium glaucum*** L.

var. *salinum* (Standl.) Boivin (Plate 394)

WESTERN OAK-LEAF GOOSEFOOT. Infrequent, below 7500 ft.; disturbed places, often in saline or alkaline soil. Jul-Aug. \*Rest area T15N R68E S35, †Lake Creek 239 834E 43 06 428N Clifton 44993, †Caine Spring 755 173E 43 36 118N Clifton 47301.

***Chenopodium incanum*** (S. Wats.) A. Heller

var. *occidentale* D. J. Crawford (Plate 395)

WESTERN MEALY GOOSEFOOT. Infrequent, below 6500 ft.; along roads, sandy places. May-Aug. \*Highway 894 T13N R67E S15.

***Chenopodium leptophyllum*** (Moq.-Tan.) Nutt. ex S. Wats. (Plates 396a, b)

NARROW LEAVED GOOSEFOOT. Frequent, below 8600 ft.; along road margins and other sandy areas, openings in pinyon-juniper. Jun-Sep. \*Highway 50 T15N R69E S31, \*Baker Creek 738 108E 43 18 495N, Snake Creek 741 013E 43 11 488N Clifton 47307.

***Chenopodium overi*** Aellen (Plates 397a, b)

OVER'S GOOSEFOOT. Limited 7500-8500 ft.; in soil on rocky slopes in pinyon-juniper woodland. These plants differ from *C. capitatum* in that the glomerulus of flowers are much smaller, and the seeds are ridged on one side and rounded on the other while the latter is acute on both sides. Some of these plants seem to flower from the bottom to the top instead of from top to bottom. Jun-Jul. \*†Baker Creek 738 939E 43 18 237N, Decathon Canyon 736306E 4302054N Clifton 45241. [*C. capitatum* (L.) Asch. var. *parvicapitatum* Welsh]

***Chenopodium pratericola*** Rydb. (Plate 398)

DESERT GOOSEFOOT. Fairly frequent, 6000-8500 ft. slopes, road banks, pinyon-juniper woodland. This taxon is very much like *C. atrovirens* except that the leaves subtending each branch are larger than the rest of the leaves, these larger leaves are often lobed at their base. A good share of these leaves have only a single vein from the leaf base, this taxon is supposed to have 3 veins, however the leaves are much broader than linear. Aug-early Sep. \*†Snake Creek 741 025 43 11 485.

***Chenopodium rubrum*** L. (Plates 399a, b)

RED PIGWEED, RED GOOSEFOOT. Limited, below 6000 ft.; moist areas along creeks. Jul. Lexington Creek 8730 ft. Raymond Jandl, †Lake Creek 239 834E 43 06 428N Clifton 44994.

***Chenopodium simplex*** (Torr.) Raf. (Plate 400)

LARGE-SEEDED or MAPLELEAF GOOSEFOOT. †Snake Creek 753 438E 43 12 352E, \*Devils Gate Canyon 744 556E 43 73 467N Clifton 48948, Snake Creek 748 430E 43 650 Clifton 51331. [*C. gigantospermum* Allen]

**CORISPERMUM**

*Corispermum americanum* (Nutt.) Nutt. (Plates 401a, b)

AMERICAN BUGSEED. Infrequent, below 6000 ft.; sandy places, valley floors. Jul-Sep. \*†South Highland Road 724 809E 42 96 448N Clifton 44974.

**DYSPHANIA**

*Dysphania botrys* (L.) Mosyakin & Clemants (Plate 402)

JERUSALEM-OAK, FEATHER-GERANIUM. Limited, below 6000 ft.; sandy moist places like sand bars, road side ditches and alluvium; introduced from Eurasia. Jun-Oct. \*Baker 749 300E 43 21 700N Clifton 48866. [*Chenopodium b. L.*]

**GRAYIA**

*Grayia spinosa* (Hook.) Moq. (Plate 403)

HOP-SAGE. Frequent, below 7000 ft.; valley floors, slopes, in various types of soil. Apr-Aug. Hamlin Valley T10N R70E S1, !Osceola Road T14N R67E S14.

**HALOGETON**

*Halogeton glomeratus* (M. Bieb.) C. Meyer (Plates 404a, b)

HALOGETON. Frequent, below 7,200 ft.; along road margins, waste places, often invading native habitat; introduced from Eurasia. Jul-Sep. !Osceola Road 11 07 21 740E 43 28 108N, Spring Valley T13N R67E S32, Hamlin Valley T10N R70E S1, Coyote Canyon 742 400E 43 69 655N.

**KOCHIA**

*Kochia scoparia* (L.) Schrad. (Plate 405)

SUMMER or MOCK CYPRESS. Fairly frequent, below 6,000 ft; along roads and other waste places; introduced from Eurasia. This is the type species for this genus. Jul-Aug. \*Baker T13N R70E S9.

**KRASCHENINNIKOVIA**

*Krascheninnikovia lanata* (Pursh) A. D. J. Meese & Smit. (Plates 406a, b)

WINTER FAT. Frequent, below 8500 ft.; open sandy to rocky slopes. Apr-Aug. \*Murphy Wash T10N R68E S15, !Osceola Road T14N R67E S15, Coyote Canyon 742400E 4369655N. [*Ceratoides l.* (Pursh) J. T. Howell]

**MICROMONOLEPIS**

*Micromonolepis pusilla* (Torr. ex S. Wats.) Ulbrich

DWARF MONOLEPIS. Limited, about 5718 ft.; alkaline valley floors, often under shrubs. May-Jun. †Spring Valley 719 520E 43 26 915N Clifton 44014. [*Monolepis p.* Torr. ex S. Wats.]

**MONOLEPIS**

- 1 Leaves usually entire; seeds papillose. . . . . *M. spathulata*  
 1 Leaves usually hastate; seeds pitted. . . . . *M. nuttalliana*

*Monolepis nuttalliana* (Schultes) E. Greene (Plate 407)

POVERTY-WEED. Infrequent, below 8300 ft.: along dirt roads, disturbed areas about cow tanks. Coyote Canyon 737850E 4367156N, Strawberry Creek 734307E 4326630N Clifton 49007.

*Monolepis spathulata* A. Gray (Plate 408)

CLUBLEAF POVERTY WEED. Rare, limited to area of collection? about 5935 ft.; vernal moist sand-gravel above a stream that doesn't run some years. Mid Jun-Jul. Lehman Creek 745 118E 43 22 085N Clifton 52150.

**NEOKOCHIA**

*Neokochia americana* (S. Wats.) G. L. Chu et S. C. Sanderson. (Plates 490a, b)

GRAY MOLLY. Fairly frequent, below 7500 ft.; valley floors and slopes, usually saline or alkaline soil. In 1934 the section Neokochia was created for this taxon, which this author has long believed to be its own genus. May-Oct. \*Pruess Lake T22S R19W S19, Baker Creek T13N R69E S13, Baker 11 07 49 039E 43 22 108N, Coyote Canyon 742 400E 43 69 655N Clifton 4890. [*Kochia a. S. Wats.*].

**SALSOLA**

- 1 Stems glabrous to bristly. . . . . *S. tragus*  
 1 Stems papillate. . . . . *S. paulsenii*

**Note;** Apparently no one really knows these plants as no one can seem to agree as to which one is which., or which name belongs to each taxon. The plants often look very different. The species names used here are only used to show the difference between each taxon. They may or may not be the correct names.

*Salsola paulsenii* Litv. (Plate 410)

HAIRY RUSSIAN-THISTLE. Infrequent, below 6000 ft.; waste places. May-Oct. \*Hamlin Valley T10N R70E S1.

*Salsola tragus* L. (Plate 411)

THREAD-LEAVED RUSSIAN-THISTLE. Frequent, below 7500 ft.; waste places. Aug.-Oct. \*Spring Valley T13N R67E S32, \*Lehman Caves 741 011E 4320 718N. [*S. pestifer* Nelson].

**SARCOBATUS**

**Note:** This has been put in its own Family by some, however the fruiting flowers look like a number of taxa in this family.

*Sarcobatus vermiculatus* (Hook.) Torr. (Plates 412a, b)

GREASEWOOD. Frequent, below 7200 ft.; saline or alkaline soil on slopes and flats. May-Aug. \*Pruess Lake T22S R19W S20, Baker Creek T13N R69E S14, †Snake Creek 11 0476 052E 43 10 600N Clifton 41058, Coyote Canyon 742 400E 43 69 655N.

**SUAEDA**

- 1 Plants perennial. . . . . *S. moquinii*  
 1 Plants annual  
 2 Floral leaves with an obvious hyaline edge on the lower margins. . . . . *S. calceoliformis*  
 2 Floral leaves lacking an obvious hyalin edge on the lower margins. . . . . *S. occidentalis*

*Suaeda calceoliformis* (Hook.) Moq. (Plate 413)

HORNED SEA-BLITE. Local, below 5800 ft.; alkali flats, associated with chenopod scrub. Mid Jul-Aug. \*Big Springs Creek T10N R70E S1, †Baking Powder Flat 722 527E 43 01 500N Clifton 52114.

*Suaeda nigra* (Raf.) J. F. Macbr. (Plate 414)

BUSH SEEPWEED. Local, below 5800 ft.; drying alkaline soil among greasewood, white-flowered rabbitbrush, and iodine bush. Aug.-Sep. \*Big Springs Creek T10N R70E S1. [*S. moquinii* (Torr.) Greene].

*Suaeda occidentalis* S. Wats. (Plate 415)

WESTERN SEEPWEED. Fairly frequent, below 6000 ft.; drying alkaline soil among greasewood and alkali sacaton. Jul-Aug. \*The Cedars T12N R67E S3, \*Big Springs Creek T10N R70E S1.

**CLEOMACEAE** Spider-flower Family  
(Capparidaceae)

- 1 Flowers purple. . . . . *Cleome*  
 1 Flowers yellow  
 2 Most of the leaflets 5. . . . . *Cleome*  
 2 Most of the leaflets 3. . . . . *Cleomella*

**CLEOME**

**Note:** Some put these in the genus *Peritoma*

- 1 Petals purple. . . . . *C. serrulata*  
 1 Petals yellow. . . . . *C. lutea*

***Cleome lutea*** Hook. (Plate 416)

YELLOW BEE PLANT. Infrequent, below 6000 ft.; areas of desert scrub and along roads. Mid Jul-Aug. \*Highway 894 T12N R68E S19. [*Peritoma l.* (Hook.) Raf.].

***Cleome serrulata*** Pursh (Plate 417)

PINK CLEOME, ROCKY MOUNTAIN BEE PLANT. Fairly frequent, below 7000 ft. Jun-Sep. \*Highway 487 T13N R70E S36, Turnley Canyon 729 186E 43 37 155N. [*Peritoma s.* (Pursh) DC.].

**CLEOMELLA**

- 1 Petals 1.5-3 mm long; fruiting stipes 0.5-2 mm long. . . . . *C. parviflora*  
 1 Petals 3-4.5 mm long; fruiting stipes 4-11 mm long. . . . . *C. plocasperma*

***Cleomella parviflora*** A. Gray (Plate 418)

SMALL-FLOWERED STINKWEED. Fairly infrequent, limited to Spring Valley; under junipers. Hun-Jul. \*†Spring Valley 720 000E 43 38 410N Clifton 51261.

***Cleomella plocasperma*** S. Wats. (Plate 419)

ALKALI STINKWEED. Infrequent, below 6000 ft.; alkali soil in openings among greasewood. Mid Jul-Aug. \*The Cedars 723 805E 43 12 692N Clifton 36151.

**COMANDRACEAE** Bastard Toadflax Family  
(Santalaceae)

**COMANDRA** Bastard Toad-Flax

***Comandra umbellata*** (L.) Nutt.

var. *pallida* (DC.) M.E. Jones (Plate 420)

PALLID BASTARD TOADFLAX. Frequent, below 9800 ft.; on slopes and flats, with sagebrush. May-Jul. Baker Creek T13N R69E S13.

**CONVOLVULACEAE** Morning-Glory Family**CONVOLVULUS** Bindweed

***Convolvulus arvensis*** L. (Plate 421)

FIELD BINDWEED. Infrequent, below 6800 ft.; waste places, fields; introduced from Europe. May-Sep. Lehman Caves 740 986E 43 20 970N.

**CORNACEAE** Dogwood Family**CORNUS** Dogwood

***Cornus sericea*** L. (Plate 423)

AMERICAN DOGWOOD, KINNIKINIK. Fairly frequent, below 9000 ft.; mainly along streams. The varieties that have been dreamed up are just a contiguum of variation in a single species. May-Aug. !Lehman Creek T13N R68E S8, Baker Creek T13N R69E S14, \*Snake Creek 748 566 43 11 449.

**CRASSULACEAE** Stonecrop Family

- 1 Plants small annuals that grow on drying mud on lake shores. . . . . *Crassula*  
 1 Plants larger perennials that grow on slopes  
 2 Flowers yellow, bisexual. . . . . *Sedum*  
 2 Flowers dark red to deep red-purple; ± unisexual. . . . . *Rhodiola*

**CRASSULA***Crassula aquatica* (L.) Schönl.

WATER PYGMY-WEED. Limited, about 9560 ft.; drying mud on lake shores. The plants at Dead Lake are at just about their extreme elevation limit. Jul-Aug. \*Dead Lake 736 366E 43 13 037N.

**RHODIOLA***Rhodiola integrifolium* Raf.

var. *integrifolium* (Plate 424)

KING'S CROWN or PURPLE-FLOWERED STONECROP. Infrequent, 10000-11500 ft.; moist rocky places. Jun-Aug. \*above Johnson Lake T13N R68E S36. [*Sedum roseum* (L.) Scop. var. *I.* (Raf.) Berger].

**SEDUM** Stonecrop

- 1 Stem leaves obovate to suborbicular, present when in flower. . . . . *S. debile*  
 1 Stem leaves lanceolate to elliptic-ovate, lacking when in flower. . . . . *S. lanceolatum*

*Sedum debile* S. Wats. (Plates 425a, b)

OPPOSITE LEAF or WEAK STEM STONECROP. Frequent, 6000-9000 ft. crevices in rock on bluffs or in talus. Some are placing this in the genus *Gormanina*. Jun-Aug. \*Baker Creek 739 188E 43 18 628N.

*Sedum lanceolatum* Torr.

LANCEOLATE LEAF or COMMON STONECROP. Fairly frequent, 6000-11000 ft.; rocky and gravelly slopes in exposed places. Some have places this in the genus *Clementsia*. Jun-Aug. \*head of Lincoln Canyon T12N R68E S14, Strawberry Creek 8600 ft. Raymond Jandl, †Baker Lake 733 400E 43 15 074N, Chalk Spring 738 254E 43 57 820N.

**CROSSOSOMATAACEAE** Crossosoma Family**GLOSSOPETALON***Glossopetalon spinescens* A. Gray

var. *microphyllum* N. Holmgren (Plate 422)

NEVADA GREASEWOOD. Fairly frequent, 6000-7500ft.; rocky bluff, and slopes, dry washes. \*Tungsten Queen Mine T11N R68E S16, Snake Creek 7400 ft. Raymond Jandl. [*Forsellesia nevadensis* (A. Gray) Greene].

**CUSCUTACEAE** Dodder Family

**Note:** This author will not put these in Convolvulaceae

**CUSCUTA** Dodder*Cuscuta pentagona* Engelm. (Plate 426)

WESTERN FIELD DODDER. Infrequent, below 5500 ft.; farm land. Jul-Oct. \*Baker Creek Ranch T13N R70E S3. [var. *calycina* Engelm., misapplied].

**ELAEAGNACEAE** Oleaster Family**ELAEAGNUS** Oleaster

- 1 Leaves alternate; introduce about habitations and on valley floors. . . . . *Elaeagnus*  
 1 Leaves opposite; native. . . . . *Shepherdia*

***Elaeagnus angustifolia* L. (Plate 427)**

RUSSIAN OLIVE. Widely scattered, below 6000 ft.; about disturbed, often moist places; introduced from temp Asia. Apr-Jun. Baker 749 051E 43 22 084N, Lake Creek 760 029E 43 06 700N Clifton 49027.

**SHEPHERDIA** Buffalo Berry

- 1 Upper surface of the leaves silvery; found in canyons below the spruce belt. . . . . *S. argentea*  
 1 Upper surface of the leaves dark green; found in the spruce belt. . . . . *S. canadensis*

***Shepherdia argentea* Nutt. (Plate 428)**

BUFFALO BERRY. Limited to the North Snake Range; about springs. Apr-May. Hampton Creek 752 074E 43 47 977N (NAD 83).

***Shepherdia canadensis* (L.) Nutt. (Plate 429)**

CANADIAN BUFFALO BERRY. Locally frequent, 7000-9200 ft.; slopes in forest. May-Jul. \*Mt. Washington Road 731 378E 43 07 738N, Strawberry Creek 9100 ft. Raymond Jandl.

**ELATINACEAE** Waterwort Family

**ELATINE**

***Elatine chilensis* C. Gay (Plate 430)**

CHILE WATERWORT. Rare, below 5800 ft.; drying mud of freshwater meadow. This is most likely the first record for Nevada. The leaves have the dark spots on the margins at the ends of the main veins. Jul-mid Sep. \*The Cedars 722 325E 43 13 560N †Clifton 52119.

**ERICACEAE** Heath Family

**ARCTOSTAPHYLOS** Manzanita

***Arctostaphylos patula* Greene (Plates 431a, b)**

GREEN LEAF MANZANITA. Frequent, 7000-10000 ft.; openings and on woodland floors. May-Jun. \*Wheeler Peak Road 736270E 4322595 Clifton 48885.

**EUPHORBIACEAE** Spurge Family

**CHAMAESYCE** Spurge

- 1 Plants annual  
 2 Seeds with corrugations obvious on the margins; plants greenish. . . . . *C. glyptosperma*  
 2 Seeds with the corrugations not obvious on the margins; plants often reddish. . . . . *C. serpyllifolia*  
 1 Plants perennial. . . . . *C. fendleri*

***Chamaesyce fendleri* (T. & G.) Small (Plates 432a, b)**

FENDLER'S SANDMAT. below 7800 ft.; exposed places from upper desert scrub to pinyon-juniper. May-Jul: \*Spring Valley T11N R67E S27.

***Chamaesyce glyptosperma* (Engelm.) Small (Plates 433a, b)**

RIDGE-SEEDED SANDMAT. Fairly frequent, below 7500 ft.; often along road margins, sandy soil in valleys. May-Sep. †Lehman Creek 6,200 ft. Clifton 11707, \*Highway 894 T13N R67E S23.

***Chamaesyce serpyllifolia* (Pers.) Small (Plate 434)**

THYME-LEAVED SANDMAT. Fairly frequent, below 7000 ft.; along road margins, canyon bottoms, sometimes on moist alkaline soil. May-Sep. \*Lehman Creek 6,200 ft., †Marble Wash 748470E 4369720N Clifton 48957

Plate 354-358a



Plate 354 *Coryphantha vivipara*



Plate 355 *Echinocereus engelmannii*



Plate 356 *Echinocereus triglochidiatus*



Plate 357a *Opuntia polycantha*



Plate 357b



Plate 358a *Pediocactus simpsonii*

Plates 358b-363



Plate 358b



Plate 359a *Humulus lupulus* var. *neomexicanus*



Plate 359b



Plate 360a *Sambucus nigra* var. *caeru-*



Plate 360b



Plate 360c



Plate 361 *Sambucus racemosa*



Plate 362 *Symphoricarpos longiflorus*



Plate 363 *Symphoricarpos rotundifolius*

Plates 364a-369



Plate 364a *Cerastium beeringianum*



Plate 364b



Plate 365 *Cerastium fontanum*



Plate 366 *Eremogone congesta* var. *simulans*



Plate 367a *Minuartia nuttallii* var. *fragilis*



Plate 368 *Eremogone kingii*



Plate 367b



Plate 369 *Minuartia rubella*

Plates 370a-374b



Plate 370a *Paronychia sessiliflora*



Plate 370b



Plate 371 *Pseudostellaria jamesi-*



Plate 372a *Sagina saginoides*



Plate 374a *Silene douglasii*



Plate 372b



Plate 373a *Silene acaulis*



Plate 374b



Plate 373b

Plates 374c-378b



Plate 374c



Plate 375a *Silene menziesii*



Plate 376a *Silene drummondii* var. *striata*



Plate 376b



Plate 375b



Plate 377 *Stellaria calycantha*



Plate 378a *Stellaria longipes* var. *altocaulis*



Plate 378b

Plates 279-384a



Plate 379 *Stellaria longipes*



Plate 380a *Stellaria umbellata*



Plate 380b



Plate 381 *Allenrolfea occidentalis*



Plate 382 *Atriplex argentea*



Plate 383a *Atriplex canescens*



Plate 384a *Atriplex confertifolia*



Plate 383b

Plates 384b-386c



Plate 384b



Plate 385a *Atriplex dioica*



Plate 385b



Plate 386d



Plate 386b



Plate 386c



Plate 387a *Atriplex* 'compacta'

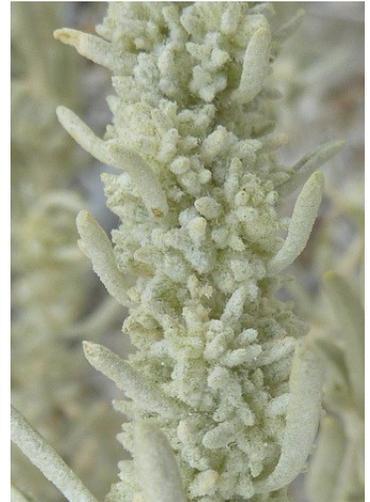


Plate 387b



Plate 386a *Atriplex bonnevillensis*



Plate 387c

Plates 387d-391b



Plate 387d



Plate 388a *Atriplex rosea*



Plate 389a *Atriplex truncata*



Plate 390 *Bassia hyssopifolia*



Plate 388b



Plate 389b



Plate 391b



Plate 391a *Chenopodium atrovirens*

Plates 392a-396b



Plate 392a *Chenopodium berlandieri* var. *zschackei*

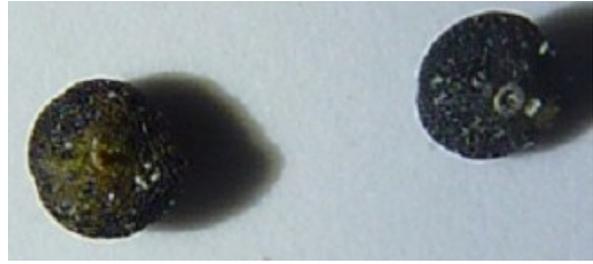


Plate 392b



Plate 393b



Plate 393c



Plate 393a *Chenopodium fremontii*



Plate 394 *Chenopodium glaucum* var. *salinum*

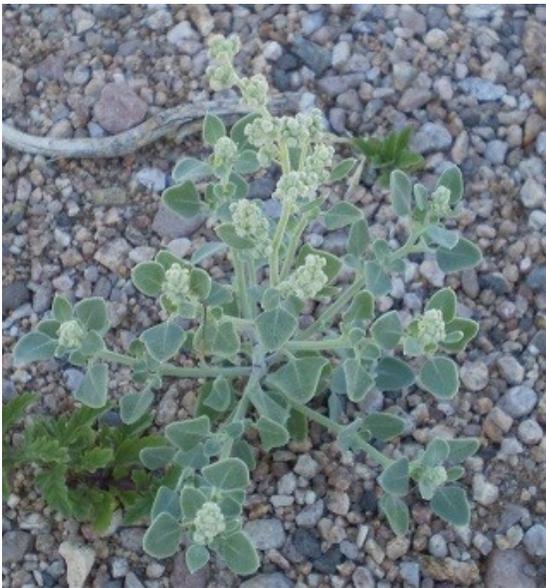


Plate 395 *Chenopodium incanum* var. *occidentale*



Plate 396a *Chenopodium leptophyllum*

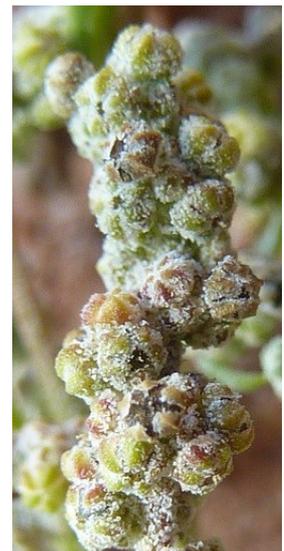


Plate 396b

Plates 397a-401b



Plate 397a *Chenopodium overi*



Plate 397b



Plate 398 *Chenopodium pratericola*



Plate 399b



Plate 399a *Chenopodium rubrum*



Plate 400 *Chenopodium simplex*



Plate 401a *Corispermum americanum*



Plate 401b

Plates 402-407



Plate 402 *Dysphania botrys*



Plate 403 *Grayia spinosa*



Plate 404a *Halogeton glomeratus*



Plate 404b



Plate 406a *Krascheninnikovia lanata*



Plate 405 *Kochia scoparia*



Plate 406b



Plate 407 *Monolepis nuttalliana*

Plates 408-412b



Plate 408 *Monolepis spathulata*



Plate 409a *Neokochia americana*



Plate 409b



Plate 410 *Salsola paulsenii*



Plate 411 *Salsola tragus*



Plate 412a *Sarcobatus vermiculatus*



Plate 412b

Plates 413-419



**Plate 413** *Suaeda calceoliformis*



**Plate 414** *Suaeda nigra*



**Plate 415** *Suaeda occidentalis*



**Plate 416** *Cleoma lutea*



**Plate 417** *Cleoma serrulata*



**Plate 418** *Cleomella parviflora*



**Plate 419** *Cleomella plocasperma*

Plates 420-425b



Plate 420 *Comandra umbellata* var. *pallida*



Plate 421 *Convolvulus arvensis*



Plate 422 *Glossopetalon spinescens* var. *microphyllum*



Plate 423 *Cornus sericea*



Plate 424 *Rhodiola integrifolia*



Plate 425a *Sedum debile*



Plate 425b

Plates 426-431b



Plate 426 *Cuscuta pentagona*



Plate 427 *Elaeagnus angustifolia*



Plate 428 *Shepherdia argentea*



Plate 429 *Shepherdia canadensis*



Plate 430 *Elatine chilensis*



Plate 431a *Arctostaphylos patula*



Plate 431b



Plate 432a *Chamaesyce fendleri*



Plate 432b



Plate 433a *Chamaesyce glyptosperma*



Plate 433b



Plate 434 *Chamaesyce serpyllifolia*

**FABACEAE** Pea Family

- 1 Flowers yellow
  - 2 Flowers 17-23 mm long. . . . . *Thermopsis*
  - 2 Flowers 7 mm or less, long
    - 3 Flowers in a head. . . . . *Medicago*
    - 3 Flowers in a raceme. . . . . *Melilotus*
- 1 Flowers white, purple red and colors in between these
  - 4 Plants having tendrils
    - 5 Leaf tips having a hair-like mucro. . . . . *Vicia*
    - 5 Leaf tip lacking a hair-like mucro. . . . . *Lathyrus*
  - 4 Plants lacking tendrils
    - 6 Leaflets serrate
      - 7 Flowers in a raceme 5-16 mm long. . . . . *Melilotus*
      - 7 Flowers in a raceme 1-4 cm long or in heads
        - 8 Flowers in a raceme 1-4 cm long; plants floriferous from many distal leaf-axils. . . . . *Medicago*
        - 8 Flowers in a head; plants not flowering as above. . . . . *Trifolium*
    - 6 Leaflets entire
      - 9 Herbage glandular-punctate or at least the lower surface of leaves
        - 10 Primary cauline leaves 2-5.5 cm long; inflorescence well exerted above the leaves. . . . . *Dalea*
        - 10 Primary cauline leaves 8-18 cm long; inflorescence mostly included among the leaves. . . . . *Glycyrrhiza*
      - 9 Herbage not glandular-punctate
        - 11 Leaflets all fastened at about the same place (digitate); one set of anthers base fixed and the other set are versatile. . . . . *Lupinus*
        - 11 Leaves pinnate or palmately 3 lobed; anthers uniform
          - 12 Keel longer than the wings
            - 13 Upper surface of leaves minutely reddish-dotted; petals red-veined; fruit a 1-seeded segment. . . . . *Onobrychis*
            - 13 Upper surface of leaves lacking reddish dots; petals not obviously red-veined; fruit several 1-seeded segments. . . . . *Hedysarum*
          - 12 Keel shorter than the wings
            - 14 The keel petals obtuse to acute, entire. . . . . *Astragalus*
            - 14 The keel petals with a nipple-like projection just below their apex. . . . . *Oxytropis*

**ASTRAGALUS** Milkvetch

- 1 Plants annual; flowers among the leaves. . . . . *A. geyeri*
- 1 Plants not incorporating the above two characters
  - 2 Leaflets lacking a distinct connection to the rachis, in age becoming prickly at the end. . . . . *A. kentrophyta*
  - 2 Leaflets (except sometimes the terminal) having a distinct connection to the rachis; ends of leaves never prickly
    - 3 Hairs attached in the middle leaving both ends free
      - 4 Plants with well developed cauline leaves
        - 5 Plants fairly erect. . . . . *A. canadensis*
        - 5 Plants quite prostrate. . . . . *A. humistratus*
      - 4 Plants lacking well developed cauline leaves; inflorescence 1-7 flowered. . . . . *A. calycosus*
    - 3 Hairs attached at their base to almost lacking
      - 6 The end leaflet continues with the rachis, sometimes composed of a rachis only
        - 7 Flower cream, whitish, faintly lilac-tinged or ochroleucous; fruit hanging down or spreading
          - 8 Plants stout, ascending, stems in clumps; fruit with a well developed stipe. . . . . *A. lonchocarpus*
          - 8 Plants slender, diffuse or prostrate; fruit sessile
            - 9 Leaflets 11-21; plants not rush-like. . . . . *A. miser*
            - 9 Leaflets, if present no more than 10; plants rush-like
              - 10 Plants of big valley floors in subalkaline soil; leaflets usually well developed. . . . . *A. diversifolius*
              - 10 Plants mostly in upland habitat, not in subalkaline soil; leaflets not well developed, sometimes lacking . . . . . *A. convallarius*
  - 7 Flowers pink-purple; pod erect. . . . . *A. toanus*
  - 6 The leaf rachis with a jointed leaf at the end

- 11 Plants with a tuft of basal leaves, stem not well developed
- 12 Leaflets 3 or 5
- 13 Pods with appressed hairs. . . . . *A. uncialis*
- 13 Pods with several types of spreading hairs. . . . . *A. newberryi*
- 12 Leaflets at least 9
- 14 Thy base of the plants forming a dense crown of thatch with persistent stipules and leaf stalks  
. . . . . *A. newberryi*
- 14 The base of the plants lacking a dense crown of thatch
- 15 Calyx 3-4.5 mm long; pod not densely hairy. . . . . *A. platytropis*
- 15 Calyx 6-17 mm long; pod densely hairy
- 16 The hairs on the leaflets  $\pm$  straight,  $\pm$  lustrous
- 17 Pods spreading hairy. . . . . *A. piutensis*
- 17 Pods appressed hairy. . . . . *A. argophyllus*
- 16 The hairs on the leaflets sinuous  $\pm$  entangled, dull white. . . . . *A. utahensis*
- 11 Plants with a fairly well developed stem with leaves scattered along it
- 18 Kell petals 4.5-7 mm long, pods  $\pm$  flattened laterally. . . . . *A. tenellus*
- 18 Kell petals 7.5-22 mm long, if keel petals are less than 7 mm long than pods not  $\pm$  flattened laterally
- 19 Herbage densely covered with fine, entangled, curly hairs; pod surface with long curly hair. . . . . *A. utahensis*
- 19 Herbage lacking dense entangled hairs; pod surface with appressed or hardly any hair
- 20 Flowers and pods in a tight head; pods 7-10 mm long, erect. . . . . *A. agrestis*
- 20 Flowers more loose or if somewhat tight than pods loose; pods 14-34 mm long
- 21 The peduncle greatly exceeding the subtending leaf. . . . . *A. filipes*
- 21 The peduncle shorter or only slight exceeding the subtending leaf
- 22 Herbage with densely appressed silvery hair; pod with dense appressed hair. . . . . *A. argophyllus*
- 22 Herbage not as above
- 23 Plants with herbage spreading gray hairy; inflorescence fuscous- or black-pilosulous; pod stipitate. . . . . *A. australis*
- 23 Plants not combing the above characters
- 24 Herbage glabrous except for the leaf-rachis and leaflet margins. . . . . *A. beckwithii*
- 24 Herbage strigulose, sometimes thinly so, cinereous or canescent or upper leaf surface glabrous
- 25 Plants with pods ascending and on a fairly well developed stipe. . . . . *A. cibarius*
- 25 Plants otherwise
- 26 Pods balloon-shaped rounded at the end. . . . . *A. whitneyi*
- 26 Pods not balloon-shaped, if bladderly, than end acuminate
- 27 Pods bladderly inflated, not bearing a stipe. . . . . *A. lentiginosus*
- 27 Pods narrowly crescentic; bearing a stipe 1-2.5 mm long. . . . . *A. chamaemeniscus*

***Astragalus agrestis*** G. Don (Plates 442a, b)

FIELD MILKVETCH. Infrequent, below 9000 ft.; drying margins of meadows. May-Aug. \*Strawberry Creek T14N R68E S24, !Burnt Mill Canyon T13N R69E S6, Chalk Spring 738 254E 43 57 820N, Negro Creek 738 587E 43 5 0807N Clifton 47136.

***Astragalus argophyllus*** T. & G.

var. *argophyllus* (Plates 443a, b, c)

SILVER-LEAVED MILKVETCH. Local, below 7600 ft.; alkaline or saline meadows, about springs in alluvial clay or loam. May-Jul. \*†The Cedars 723 892E 43 13 000N Clifton 43931, Highway 50 722 842E 4336 232N, Spring Valley 718 483E 43 38 082N Clifton 45635.

***Astragalus australis*** (L.) Lam.

var. *glabriusculus* (Hook.) Isely (Plates 444a, b, c)

INDIAN MILKVETCH. Locally frequent in the North Snake Range, 8000-11500 ft.; rocky slopes. The var. *glabriusculus* is a name used for the plants found in this area. A complete study of this group of plants is needed throughout its range to see what our plants really are. Head of Smith Creek 737 125E 43 54 072N (NAD 83) Clifton 47144, The Table 7422 49E 43 51 786 (NAD 83) Clifton 47161.

***Astragalus beckwithii*** T. & G.

var. *purpureus* M.E. Jones (Plates 445a, b, c)

PURPLE FLOWER BECKWITH'S MILKVETCH. Fairly frequent, below 7500 ft.; gravelly places. late Apr-Jun. \*Murphy Wash T10N R68E S10, !Baker Creek Road 11 07 41 547E 43 20 142N, Strawberry Creek 7000 ft. Raymond Jandl., Hampton Creek 749 481E 43 48 040N (NAD 83) Clifton 47084, †Dry Canyon 733 700E 43 61 500N Clifton 48904.

*Astragalus calycosus* S. Wats.

- a Flower white with a maculate keel. . . . . var. 'albiflorus'  
 a Flowers not white. . . . . var. *calycosus*

var. 'albiflorus' (Plates 447a, b)

WHITE-FLOWERED TORREY'S MILKVETCH. Fairly frequent, above 10000 ft.; rocky slopes, moraines. Aug.-Sep. Slopes of Wheeler Peak and below the glacier.

var. *calycosus* (Plates 446a, b)

TORREY'S MILKVETCH. Frequent, below 10000 ft.; dry, exposed, rocky places. The plants at very high elevations have white flowers with maculate keel. Late Apr-early Aug. \*Spring Valley T11N R68E S17, \*Big Wash T12N R70E S27, \*Mount Washington T12N R68E S11, Chalk Spring 738 254E 43 57 820N, †South Fork Marble Canyon 738 250E 43 65 430N Clifton 48923.

*Astragalus canadensis* L.

var. *brevidens* (Gand.) Barneby (Plates 448a, b)

HAIRY FRUIT CANADA MILKVETCH. Infrequent, below 8000 ft.; open grassy places. Jun-Jul. !Grub Gulch T14N R68E S7, \*†Snake Creek 746 390E 43 10 640N Clifton 48827, Hampton Creek 749481E 4348040N (NAD 83) Clifton 47083, Hendrys Creek 750460E 4345133N.

*Astragalus chamaemeniscus* Barneby (Plates 449a, b)

GROUND-CRESCENT MILKVETCH. Infrequent, below 6300 ft.; knolls, gullied foothills, valley floors in light soils derived from limestone, usually under sheltering under shrubs. May-early Jun. \*Spring Valley T11N R67E S26.

*Astragalus cibarius* E. Sheldon

BROWSE MILKVETCH. Fairly frequent, below 6000 ft.; valley floors and slopes, usually under other shrubs. Apr-Aug. \*Snake Valley T13N R70E S5, \*Spring Valley T12N R67E S34, Cross Road T13N R70E S5, †Highway 894 726 265E 43 04 952N Clifton 43933.

*Astragalus convallarius* Greene

var. *convallarius* (Plates 450a, b, c)

LESSER RUSHY MILKVETCH. Infrequent, below 8300 ft.; openings in sagebrush in pinyon-juniper woodland. Jun-early Jul. Deerhead Canyon 738 407E 43 50 950N (NAD 83) Clifton 47272, \*Miller Basin Wash 732 290E 43 42 976N Clifton 48996

*Astragalus diversifolius* A. Gray (Plates 451a, b, c)

ALKALI MEADOW MILKVETCH. Limited, alkali meadows or open encrusted saline soil on valley bottoms. May-Jul. Spring Valley 719 483E 43 38 082N Clifton 45634, \*Spring Valley 722 980E 43 35 700N Clifton 51266.

*Astragalus filipes* A. Gray

THREAD-LEAVED LOCOWEED. below 7000 ft.; sagebrush slopes. North Snake Range.

*Astragalus geyeri* A. Gray

var. *geyeri* (Plates 452a, b)

GEYER'S MILKVETCH. Limited, below 6000 ft.; sandy places. Apr-May. \*Hamlin Valley T10N R70E S13.

*Astragalus humistratus* A. Gray

var. *humivagans* (Rydb.) Barneby (Plate 453a, b, c)

GROUND WANDERING MILKVETCH. Limited, about 6480 ft.; barren calcareous tuft. May-Jun. \*Red Ledges 736 832E 42 84 395N Clifton 43977.

*Astragalus kentrophyta* A. Gray

- a Herbage pubescent with base fixed hairs; corolla normally purple or purplish, rarely white. . . . . var. *tegetarius*  
 a Herbage pubescent with at least some hairs that are attached in the middle leaving both ends free "dolabriform" (one end may be obscure; corolla commonly whitish. . . . . var. *elatus*

var. *elatus* S. Wats. (Plate 454)

WHITE FLOWER THISTLE MILKVETCH. below 8000 ft. Jun-Sep. \*Red Ledges 735800E 4283940N Clifton 45152

var. *tegetarius* (S. Wats.) Dorn (Plates 455a, b)

PURPLE FLOWER THISTLE MILKVETCH. Frequent, 10000-12000 ft.; alpine turf, rocky slopes. Jun-Sep. \*above Stella Lake T12N R68E S11, !Wheeler Peak 731 696E 43 19 755N, †Big Wash Peak 738 761E 43 07 048N Clifton 45261

*Astragalus lentiginosus* Hook.

**Note:** There are numerous plants that seem to be transitional one to another. Var. *latus* seems to be the only one that remains

distinct.

- a Flowers whitish or ochroleucous, sometimes faintly lilac-tinged or veined wings and maculate keel-tip. . . . . var. *salinus*  
 a Flowers purple (sometimes pallid when dried)  
 b Mature pod papery thin, pressing flat. . . . . var. *scorpionis*  
 b Mature pod wall thicker not pressing flat  
 c Flowers pale; pod on a short stipe . . . . . var. *latus*  
 c Flowers bright pink-purple; pod sessile. . . . . var. *diphysus*

var. *diphysus* (A. Gray) M.E. Jones (Plates 456a, b, c)

WIDE SPREAD FRECKLED MILKVETCH. Fairly frequent, below 7400 ft.; May-Jul. †Hamlin Valley 751 700E 42 87 587N Clifton 43892, \*Pine Creek 729246E 4319711N Clifton 45676, Marble Wash 745573E 4369727N Clifton 48954.

var. *latus* (M. E. Jones) M. E. Jones (Plates 457a, b, c)

ROUND POD FRECKLED MILKVETCH. Fairly frequent, 7300-9500 ft.; gravelly slopes in open timber. All the plants this author has looked at in the Schell Creek Range and this range have a short stipe, this is not mentioned in any literature. Variety *pohlii*, which has a short stipe has whitish flowers. May-Jul. Hampton Creek 749 590E 43 47 880N (NAD 83) Clifton 47083, Deerhead Canyon 739 110E 43 52 450N (NAD 83) Clifton 47137, Big Canyon 740 850E 43 53 235N (NAD 83) Clifton 47178.

var. *salinus* (Howell) Barneby (Plates 458a, b, c)

SALINE FRECKLED MILKVETCH. Infrequent, below 8600 ft.; dryer parts along streamside meadows, rocky slopes, valleys. May-Jul. †Hampton Creek 749481E 4348040N Clifton 47084, †\*North Branch Rye Grass Canyon 736 700E 43 62 390N Clifton 48914.

var. *scorpionis* M. E. Jones

THIN POD FRECKLED MILKVETCH. Limited, about 7630 ft.; open riparian. May-June. †Strawberry Creek 734 307E 43 26 630N Clifton 49005.

*Astragalus lonchocarpus* Torr (Plates 459a, b, c)

GREAT RUSHY MILKVETCH. Limited, about 5720 ft.; subalkaline valley floor next to the highway. May-Jul. \*†Crystal Queen Mine 720 056E 43 27 140 Clifton 43985.

*Astragalus miser* Dougl. ex Hook.

var. *oblongifolius* (Rydb.) Cronq. (Plates 460a, b, c)

WEEDY MILKVETCH. Local, above 9000-11000 ft., North Snake Range; grassy sagebrush, open forest floors. Mid Jun-Jul. Big Canyon 740 030E 4352 845N (NAD 83) Clifton 47142.

*Astragalus newberryi* A. Gray

var. *castoreus* M.E. Jones (Plates 461a, b, c)

NEWBERRY'S MILKVETCH. Frequent, below 8000 ft.; openings in sagebrush and pinyon-juniper. Apr-Jul. \*Spring Valley T11N R68E S18, †Baker Creek Road 741 535E 43 19 976, Chalk Spring 738 254E 43 57 820N, †Dry Canyon 734370E 4361553N Clifton 48905.

*Astragalus piutensis* Barneby & Mabb. (Plates 462a, b, c)

SEVIER MILKVETCH. Frequent, below 10200 ft.; openings in sagebrush, pinyon-juniper. Apr-Jun \*Big Spring Wash T10N R69E S17, \*Snake Creek T12N R69E S13, †Snake Creek 737 994E 43 14 182N. [*A. marianus* Rydb.].

*Astragalus platytropis* A. Gray (Plate 463)

BROAD-KEELED MILKVETCH. Fairly frequent, 9000-11500 ft. ft.; rock crevices on steep slopes, talus and screes, rocky slopes. Jul-Aug. \*Mount Washington T12N R68E S11, †Highland Ridge 11 07 34 750E 43 06 771N.

*Astragalus tenellus* Pursh (Plates 464a, b)

PULSE MILKVETCH. Frequent, 6000-10500 ft.; open dry to fairly mesic places. The plants that grow at higher elevations have a coarse under ground caudex, the fruiting peduncles are scarcely if at all longer than the subtending leaves and there are flowers almost at the base of the plant. May-Aug. \*Snake Creek T12N R69E S9, †Snake Creek 739 900E 43 11 600N, Snake Creek 737 423E 43 10 710N, †Decathon Canyon 737 616E 43 03 870N Clifton 45238, Hampton Creek 749 481E 43 48 040N (NAD 83) Clifton 47085, Chalk Spring 738 254E 43 57 820N.

*Astragalus toanus* M. E. Jones

var. *toanus* (Plates 465a, b, c)

TOANO MILKVETCH. Infrequent, limited to valley floors. May-Jun. Spring Valley 724 780E 42 96 880N Clifton 51276.

*Astragalus uncialis* Barneby

CURRANT MILKVETCH. Limited, about 5780 ft., incrustated, sandy soil on hummocks on valley floors. May-Jun. Spring Creek 719423E 4318028N Clifton 45138.

*Astragalus utahensis* (Torr.) T. & G. (Plates 466a, b, c)

UTAH MILKVETCH. Infrequent, below 7000 ft.; rocky slopes, gravel-banks, openings in sagebrush. Apr-May. \*Spring Valley

728 663E 42 99 349N, †Johns Wash 734 524E 42 86 020N Clifton 43968.

*Astragalus whitneyi* A. Gray

var. *whitneyi* (Plates 467a, b)

BALLOON MILKVETCH. Fairly frequent, 10000-11500 ft., open, often rocky places. Other varieties to the west. May-Aug.

\*Mount Washington T12N R68E S14, Big Canyon 741 928E 43 51 790 (NAD 83) Clifton 47153.

#### DALEA

*Dalea searlsiae* (A. Gray) Barneby (Plates 468a, b)

SEARLS'S PRAIRIE-CLOVER. Limited, below 7700 ft.; gravelly slopes in openings in pinyon-juniper. Apr-Jul. !Osceola Road T15N R98E S32.

#### GLYCYRRHIZA

*Glycyrrhiza lepidota* Pursh (Plates 469a, b, c)

WILD LICORICE. Infrequent, below 6700 ft.; subalkaline shrubland, streams and ditch banks. May-Jun. \*Big Springs Creek T10N R70E S1, \*South side Snake Creek 6450 ft. F. Landau 76

#### HEDYSARUM

*Hedysarum boreale* Nutt. (Plates 470a, b, c)

NORTHERN SWEETVETCH. Limited, about 7720 ft.; rocky slope in pinyon-juniper woodland. Mid May-early Jul. †\*Miller Basin Wash 733420E 4340185N Clifton 48988.

#### LATHYRUS

*Lathyrus brachycalyx* Rydb.

var. *brachycalyx*

BONNEVILLE VETCHLING, RYDBERG'S SWEET PEA. Locally frequent, below 7000 ft.; washes. rocky slopes in pinyon-juniper. Mid Apr-Jun. \*Big Springs Wash T10N R69E S17.

#### LUPINUS

*Lupinus argenteus* Pursh complex (Plates 471a, b, c)

All the characters that are used, show up in different combinations throughout the range of this complex. There is no way to write a key for this complex. One worker named 10+ species from the Spring Mountains out of Las Vegas, which no one recognizes.

SILVER LUPINE. Frequent, 6000-9300 ft.; open slopes and flats in sagebrush and woodlands. May-Jul. \*Snake Creek T13N R68E S36, Baker Creek 738 796E 43 17 954N, †Snake Creek 739 900E 43 11 600N Clifton 41033, Ptomaine Springs Ridge 733 700E 43 67 825N Clifton 51314, \*†Pine Creek 729 246E 43 19 711N Clifton 45675. [var. *rubricaulis* (Greene) Welsh, var. *utahensis* (S. Wats.) Barneby].

#### MEDICAGO

*Medicago lupulina* L. (Plate 472)

BLACK MEDIC. Infrequent, below 7000 ft.; about meadows, farmland, road margins; introduced from Eurasia. Apr-May. !Lehman Creek T13N R69E S12 Clifton 11734, \*Snake Creek 739 900E 43 11 600N.

*Medicago sativa* L. (Plate 473)

ALFALFA, LUCERNE. Infrequent outside of cultivation, below 7500 ft.; waste places. May-Oct. Baker Creek T13N R69E S29, !Lehman Creek T13N R69E S12, \*Lehman Creek, Baker Ranch 750 025E 43 22 005N Clifton 48860.

#### MELILOTUS Sweet Clover

1 Flowers white..... *M. albus*  
1 Flowers yellow..... *M. officinalis*

***Melilotus albus*** Medikus (Plate 474)

WHITE SWEET CLOVER. Fairly frequent, below 7600 ft.; road margins, waste places, farmland, stream gravels, seeps, and other vernal moist habitats; introduced from Eurasia. May-Sep. \*Pole Canyon 730 459E 43 08 654N, !Baker Creek T13N R69E S14.

***Melilotus officinalis*** (L.) Pallas (Plate 475)

YELLOW SWEET CLOVER. Fairly frequent, below 7000 ft.; about the same habitats as the preceding; introduced from Eurasia. May-Sep. †Hendrys Creek 750 453E 43 45 133N Clifton 47285, Snake Creek 746 390E 43 10 640N Clifton 48828.

**ONOBRYCHIS*****Onobrychis viciifolia*** Scop. (Plates 476a, b)

SAINFOIN. Limited, below 6500 ft.; roadsides, farmland, soil-improvement; introduced from Europe. May-Jul: \*Lexington

**OXYTROPIS**

1 The flowers at full anthesis nodding; leaflets on the longest leaves at least 25; fruit deflexed. . . . . ***O. deflexa***

1 The flowers at full anthesis erect; leaflets on the longest leaves up to 17; fruit erect. . . . . ***O. parryi***

***Oxytropis deflexa*** (Pallas) DC.

var. ***foliolosa*** (Hook.) Barneby (Plates 477a, b, c)

LEAFY LOCOWEED. Fairly frequent, limited to Mt. Moriah above 11,200 ft.; rocky slopes. Jul-Aug. \*†Mt Moriah 742 487E 43 51 530N Clifton 52233.

***Oxytropis parryi*** A. Gray (Plates 478a, b, c)

PARRY'S OXYTROPE. Fairly frequent, 10000-11800 ft.; open rocky slopes and crevices, often very steep. Jun-Aug. \*above Stella Lake T13N R68E S11, †Highland Ridge 734 750E 43 06 771N.

**THERMOPSIS** False Lupine***Thermopsis rhombifolia*** (Pursh) Richardson

var. ***montana*** (T. & G.) Isely (Plates 479a, b)

MOUNTAIN FALSE LUPINE. Frequent, below 8,000 ft.; meadow margins, riparian. May-Aug. \*Snake Creek T12N R70E S11, †Baker Creek 738 822 43 18 448.

**TRIFOLIUM** Clover

1 Flower-heads sessile between the stipules of a pair of short leaves

2 Plants tall, coarse; introduced. . . . . ***T. pratense***

2 Plants dwarf; native. . . . . ***T. andinum***

1 Flower-heads on peduncles

3 The inflorescence down inside of the leaves. . . . . ***T. gymnocarpon***

3 The inflorescence mostly above the leaves

4 Calyx glabrous. . . . . ***T. repens***

4 Calyx hairy

5 Flowers 8-17 mm long; calyx in age not inflating

6 Most or all the flowers not drooping; calyx hairs straight. . . . . ***T. longipes***

6 Most all the flowers drooping; calyx woolly. . . . . ***T. eriocephalum***

5 Flowers 4-6 mm long; calyx in age inflating. . . . . ***T. fragiferum***

***Trifolium andinum*** Nutt. (Plates 480a, b)

GREAT DIVIDE CLOVER. Infrequent, 6800-7800 ft.; openings in sagebrush on slopes, crevices on limestone rock. The plants at Murphy Wash don't represent the typical two varieties. The peduncles are paired but are lacking the subtending, short leaf and the leaflets are very dentate and rounded at their apex. These may represent an unnamed variety. May-Jul. \*Murphy Wash T11N R68E S35, Lehman Ridge Weather Station 7200 ft. Raymond Jandl

***Trifolium eriocephalum*** Nutt.

var. ***villiferum*** (House) J. S. Martin (Plates 481a, b)

WOOLY HEAD CLOVER. Limited, below 6000 ft.; wet meadows that is used for pasture, shaded places in riparian. Jun-Jul.

†Lehman Creek, Baker Ranch 750 170E 43 22 165N Clifton 48864, \*Snake Creek 746 050E 43 10 610 Clifton 51332.

***Trifolium fragiferum*** L. (Plates 482a, b)

STRAWBERRY CLOVER. Limited, about 5370 ft., along streams and meadows; introduced from Europe. Jun-Aug. †Lake Creek 760 026E 43 06 776N Clifton 41064, \*Lehman Creek, Baker Ranch 750 104E 43 22 176N Clifton 48854.

***Trifolium gymnocarpon*** T. & G. (Plate 483)

DWARF CLOVER. Frequent, 7000-10500 ft.; openings in woodland, open rocky slopes. This author doesn't recognize what is called subspecies *palmeri*. May-Jul. \*above Stella Lake T13N R68E S11, !Wheeler Peak Campground T13N R68E S11, Chalk Spring 738 254E 43 57 820N.

***Trifolium longipes*** Nutt.

var. *hansenii* (Greene) Jeps. (Plates 484a, b, c)

LONG-STALKED CLOVER, HANSEN'S SUMMER CLOVER. Fairly frequent, 6000-9500 ft.; open or wooded meadows. May-Aug. !Baker Creek T13N R69E S29, \*Baker Creek 739 050E 43 18 640N Clifton 48810.

***Trifolium pratense*** L. (Plate 485)

RED CLOVER. Fairly infrequent, below 7,000 ft.; fields, along creeks, meadows Jun-Aug. Hendry's Creek 750 554E 43 45 030N Clifton 47289.

***Trifolium repens*** L. (Plates 486a, b)

WHITE CLOVER, DUTCH CLOVER. Frequent, below 8500 ft.; moist places. May-Aug. \*Baker Creek 739 186E 43 18 826N, !Burnt Mill Canyon T13N R69E S6.

#### VICIA Vetch

***Vicia americana*** Willd. (Plates 487a, b, c)

AMERICAN VETCH. Frequent, below 8500 ft.; riparian. The leaflets vary in their width. May-Jul. Baker Creek 739 186E 43 18 826N.

### FUMARIACEAE

#### CORYDALIS

***Corydalis aurea*** Willd. (Plates 488a, b, c)

GOLDEN CORYDALIS. Rare, below 9900 ft.; spring moist soil, burns, along streams and in openings in brush. May-early Aug. \*Horse Heaven 742 907E 43 14 357N Clifton 45298.

### GENTIANACEAE Gentian Family

- |  |                           |
|--|---------------------------|
| 1 Corolla pink. . . . .                                    | <b><i>Centaurium</i></b>  |
| 1 Corolla lacking pink                                     |                           |
| 2 Corolla ± rotate, lacking a well developed tube. . . . . | <b><i>Frasera</i></b>     |
| 2 Corolla having a well developed tube                     |                           |
| 3 Corolla 23-40 mm long. . . . .                           | <b><i>Gentiana</i></b>    |
| 3 Corolla 9-16 mm long. . . . .                            | <b><i>Gentianella</i></b> |

#### CENTAURIUM

**Note:** This author doesn't buy the work done by Mansion or Mansion & Zeltner. It is nit-picky.

***Centaurium exaltatum*** (Griseb.) Piper (Plates 489a, b, c)

GREAT BASIN CENTAURY. Infrequent, below 6000 ft.; moist to wet meadows, sometimes on the saline side. Most of the plants from Baking Powder Flat have 5 petals, some with 4 in the same population. This means the most recent work is flawed. Jul-Aug. \*Snake Valley T10N R70E S13, !Lehman Creek, †Lake Creek 760 026E 43 06 776N Clifton 41068, Caine Spring 755 142E 43 35 985 Clifton 52147. [*Zeltnera e.* (Griseb.) G. Mans.].

#### FRASERA

- |   |                           |
|---|---------------------------|
| 1 Stems robust, tall; plants like a candle. . . . . | <b><i>F. speciosa</i></b> |
|---|---------------------------|

- 1 Stems thinner, shorter; plants not like a candle  
 2 Plants biannual; sagebrush and pinyon-juniper woodland . . . . . *F. albomarginata*  
 2 Plants a strong perennial; valley floors. . . . . *F. gypsicola*

***Frasera albomarginata*** S. Wats. (Plates 490a, b)

WHITE-MARGINED or DESERT FRASERA. Frequent, below 7800 ft.; openings in pinyon-juniper on rocky soil. Jun-Jul. \*Big Wash T12N R70E S27, †Snake Creek 748 534E 43 11 671N.

***Frasera gypsicola*** (Barneby) D. Post (Plates 491a, b)

NARROW-LEAVED FRASERA. Fairly infrequent, 5000-5500 ft.; chenopod scrub on valley floors. Jul. \*†Gandy Road 756 345E 43 32 960N Clifton 51296, Big Springs Creek 755 500E 42 94 450N.

***Frasera speciosa*** Griseb. (Plate 492)

DEER-TONGUE, ELKWEED, GIANT FRASERA. Fairly frequent, 9000-10500 ft.; on sparsely wooded slopes. Jun-Jul. \*Mount Washington T12N R68E S14.

**GENTIANA** Gentian

***Gentiana affinis*** Griseb. (Plate 493)

ROCKY MOUNTAIN GENTIAN. Limited, 5700-9000 ft.; meadows, seeps, moist soil in woodlands. Late Jul-early Sep. †Baker Creek 743 400E 43 20 073N.

**GENTIANELLA**

***Gentianella amarella*** (L.) Boerner

FELWORT. Infrequent, 9,000-11,000 ft.; meadow and streamside riparian. Our plants have been called ssp. *acuta* (Michx.) J. Gillett if one thinks that ours are different than the ones from Europe. There are plants of this taxon in Reese River Valley, Nevada that have white flowers and the herbage turns dark purple by flowering time. Jul-Sep. \*Lehman Creek T13N R68E S11, †Below Johnson Lake 735 125 43 13 607 Clifton 43287.

**GERANIACEAE** Geranium Family

- 1 Leaves pinnate; fertile stamens 5. . . . . *Erodium*  
 1 Leaves palmately lobed; stamens 10. . . . . *Geranium*

**ERODIUM** Filaree

***Erodium cicutarium*** (L.) L'Hér. (Plate 494)

RED-STEMMED FILAREE. below 8,000 ft.; road margins, sandy places; introduced from Eurasia. Apr-Jul. \*Baker Creek 738 685E 43 17 595N, †Lehman Creek T13N R69E S12.

**GERANIUM**

- 1 Flowers white or sufficed with pink; glandular hairs of the inflorescence purple tipped. . . . . *G. richardsonii*  
 1 Flowers deep pink to deep purple; glandular hairs of the inflorescence yellowish or white tipped. . . . . *G. fremontii*

***Geranium caespitosum*** James

var. *fremontii* (A. Gray) Dorn

FREMONT'S SMALL-LEAVED GERANIUM. 7700-10000 ft.; mesic slopes. Reported for the North Snake Range. Jun-Jul. [*G. fremontii* A. Gray].

***Geranium richardsonii*** Fisch. & Trautv. (Plate 495)

RICHARDSON'S GERANIUM. 6,500-10,000 ft.; mesic slopes, riparian. Reported for the North Snake Range. Jun-Aug.

**GROSSULARIACEAE** Gooseberry

**RIBES** Gooseberry, Currant

- 1 Stems lacking spines
  - 2 Leaves viscid, usually with sessile glands at least above. . . . . *R. cereum*
  - 2 Leaves not as above
    - 3 Flowers yellow; leaves thick; branches erect. . . . . *R. aureum*
    - 3 Flowers not yellow; leaves thin; branches widely spreading. . . . . *R. inerme*
- 1 Stems spiny
  - 3 Flowers ± flat, lacking a well developed tube; pedicel jointed below the flowers, this area subtended by two small bracts. . . . . *R. montigenum*
  - 3 Flowers with a well developed tube; pedicels not as above
    - 4 Plants not in mesic sites; berry hairy. . . . . *R. velutinum*
    - 4 Plants of mesic sites; berry glabrous. . . . . *R. inerme*

***Ribes aureum*** Pursh (Plates 496a, b)

var. *aureum*

GOLDEN CURRANT. Fairly frequent, below 7000 ft.; about springs, washes and streams. Late Apr-Jun. \*Snake Creek T12N R70E S11, \*The Cedars T12N R67E S2, Snake Creek 743 330E 43 11 325N.

***Ribes cereum*** Dougl. (Plates 497a, b, c)

WAX CURRANT. Frequent, 6000-9000 ft.; slopes, flats, bluffs, woodlands, less often in riparian. May-Aug. \*Gray Cliff T13N R69E S22, \*Tungsten Queen Mine T11N R68E S16, Lehman Creek T13N R69E S8, !Wheeler Peak Campground Clifton 11041. [ var. *inebrians* (Lindl.) C.L. Hitchc.].

***Ribes inerme*** Rydb

var. *inerme* (Plates 498a, b)

WHITE-STEMMED GOOSEBERRY. Limited, about 9280 ft.; mesic places. Jun-Jul. \*†Baker Creek 736 210E 43 17 350N Clifton 41053.

***Ribes montigenum*** McClatchie (Plate 499)

WESTERN PRICKLY CURRANT. Frequent, 7,000-11,000 ft. open or wooded slopes, often rocky. Jun-Aug. !Wheeler Peak Clifton 11244.

***Ribes velutinum*** Greene (Plate 500)

PLATEAU GOOSEBERRY. Infrequent, above 7000 ft., North Snake Range; open dry rocky or sandy slopes. Chalk Spring 738 254E 43 57 820N.

## HALORAGACEAE Water-milfoil Family

### MYRIOPHYLLUM

***Myriophyllum sibiricum*** V. Kmarov

AMERICAN MILFOIL. Limited, below 5800 ft; standing water of ponds. \*The Cedars T12N R67E S2. [*M. spicatum* L. ssp. *exalbescens* (Fern.) Hulten misapplied]

## HELLEBORACEAE Hellebore Family

(Misapplied to Ranunculaceae)

- 1 Flowers with a spur for each perianth segment. . . . . *Aquilegia*
- 1 Flowers with a single spur or not spurred at all
  - 2 Flowers with a single spur; flowers blue or red. . . . . *Delphinium*
  - 2 Flowers compressed side ways, not spurred; flowers purplish. . . . . *Aconitum*

### ACONITUM

***Aconitum columbianum*** Nutt. (Plate 502)

COLUMBIA MONKSHOOD. Frequent, 6000-10000 ft.; riparian., mesic woodland floors, aspen stands. Jun-Aug. !Lehman Creek T13N R69E S8, †Blue Canyon 733 284E 43 24 176N Clifton 41048, Baker Creek 739 740E 43 19 290N Clifton 49031.

**AQUILEGIA** Columbine

- 1 Flowers reddish or lavender, nodding
- 2 Flowers reddish. . . . . *A. formosa*
- 2 Flowers lavender. . . . . cross
- 1 Flowers blue or blue and white
- 3 Leaves blue-glaucous; flowers a fairly deep blue; follicles 12-22 mm long. . . . . *A. scopulorum*
- 3 Leaves green; flowers not a deep blue; follicles 20-30 mm long. . . . . *A. coerulea*

*Aquilegia coerulea* James (Plate 501)

COLORADO COLUMBINE. Frequent, 9000-11700 ft.; open rocky slopes, alpine turf, crevices, and sometimes open forest floors. The variety *ochroleuca* is only a color phase. There are some pressed plants that are all pale yellow. This and *A. scopulorum* grow next to each other on Mount Washington and they seem to cross quite often. (Plate 503) These crosses will key out to *A. pubescens*. Jun-Aug. \*Mount Washington T12N R68E S11, †Mt. Washington 733 354E 43 10 506N, †Pyramid Peak 733 957E 43 14 786N, †Baker Lake 733 400E 43 15 074N.

*Aquilegia coerulea* X *formosa*

The flowers are large and have a lavender color. Decathlon Canyon 736 950E 43 03 560N Clifton 45236

*Aquilegia formosa* Fisch.

var. *formosa* (Plate 504)

NORTHWEST CRIMSON COLUMBINE. Frequent, 6000-10000 ft.; riparian, mesic woodland floors. Jun-Aug. Lehman Creek T13N R69E S8, †Burnt Mill Canyon T13N R69E S6, \*Baker Creek 739 050E 43 18 640N Clifton 48808.

*Aquilegia scopulorum* Tidestr. (Plate 505)

BLUE or ROCK COLUMBINE. Infrequent above 10,000 ft.; limestone cliffs, ledges, and slopes. Jul-Aug. †North Fork Big Wash 734 197E 43 10 336N, Big Canyon 741 928E 43 51 790 (NAD 83) Clifton 47151.

**DELPHINIUM** Larkspur*Delphinium andersonii* A. Gray (Plates 506a, b)

ANDERSON'S LARKSPUR. Fairly frequent, below 8500 ft.; slopes, flats, canyons, valley floors, in various soils. May-Jun. \*Big Wash T12N R70E S27, Chalk Spring 738 254E 43 57 820N, Deerhead Canyon 739 114E 43 52 556N (NAD 83) Clifton 47139, †Dry Canyon 734 298E 43 64 450N Clifton 48909.

**HIPPURIDACEAE** Mare's-tail Family

**Note:** This has been put in Plantaginaceae where it doesn't belong.

**HIPPURIS***Hippuris vulgaris* L. (Plates 507a, b)

MARE'S-TAIL. Limited, below 6000 ft.; sluggish water. July-Sep. †Lake Creek 239 834E 43 06 428N Clifton 44992, Blind Spring 724 798E 42 97 816N.

**HYDROPHYLLACEAE** Waterleaf Family

**Note:** They are now putting this into Boraginaceae which is absurd.

- 1 Leaves strictly basal. . . . . *Hesperochiron*
- 1 Leaves basal as well as cauline
- 2 Flowers axillary, solitary in small dense leafy clusters. . . . . *Nama*
- 2 Flowers not as above
- 4 Upper cauline leaves sessile and clasping, the upper most, several leaves entire. . . . . *Eucrypta*
- 4 Upper cauline leaves not clasping, the upper most leaves not much different from the lower. . . . . *Phacelia*

## EUCRYPTA

*Eucrypta micrantha* (Torr.) A. Heller (Plates 508a, b)

DESERT EUCRYPTA. Infrequent, below 6700 ft.; below cliffs, in the shade of pinyon-junipers. May-Jun. \*†Marble Wash 743540E 4370136N Clifton 48944, Devils Gate Canyon 744556E 4373467N, \*Gray Cliffs 740 768E 43 19 080N Clifton 51329.

## HESPEROCHIRON

*Hesperochiron pumilus* (Griseb.) T. C. Porter (Plates 509a, b)

DWARF HESPEROCHIRON. Infrequent, below 7000 ft.; moist meadow, sometimes on the saline side. May-Jun. \*The Cedars T12N R67E S2.

## NAMA

1 Style free to its base; corolla normally 8-16 mm long. . . . . *N. demissum*

1 Style partly fused; corolla normally 3-5 mm long. . . . . *N. densum*

*Nama demissum* A. Gray (Plate 510)

PURPLE MAT. Locally frequent, below 6000 ft.; sandy or gravelly slopes and flats that are open. \*Hamlin Valley T10N R70E S12.

*Nama densum* Lemmon

var. *parviflorum* (Greenm.) C.L. Hitchc.

COMPACT NAMA. Infrequent, below 7500 ft.; most often in sandy soil in openings among brush. May-Jun. \*Big Springs Wash T10N R69N R20.

## PHACELIA

1 Plants annual

2 Corolla well included within the calyx; most of the flowers with four lobes. . . . . *P. tetramera*

2 Corolla exserted, sometimes shortly so; most of the flowers with 5 lobes

3 Stamens long exserted; corolla showy. . . . . *P. crenulata*

3 Stamens included; corolla inconspicuous

4 Leaves entire

5 Flowers very soon deciduous; inflorescence starting at least 3 nodes above base. . . . . *P. incana*

5 Flowers hanging on to the fruit; inflorescence starting close to the bottom. . . . . *P. saxicola*

4 Leaves pinnatifid

6 Inflorescence well above the leafy part of the plant; calyx segments in fruit spatulate. . . . . *P. affinis*

6 Inflorescence often down among the leaves; calyx segments in fruit linear to linear-oblongate. . . . . *P. ivesiana*

1 Plants perennial

7 Leaves pinnatifid with narrow divisions; filaments of the stamens glabrous and long exserted. . . . . *P. sericea*

7 Leaves entire or if pinnatifid, divisions broad; filaments of the stamens hairy, if glabrous, than included. . . . . *P. hastata*

*Phacelia affinis* A. Gray (Plates 511a, b)

PURPLE BELL PHACELIA. Fairly frequent, below 7000 ft.; gravelly or sandy open places. \*Big Wash T12N R70E S27, \*Big Springs Wash T10N R69E S20, †Black Horse Canyon 734 230E 43 33 960N Clifton 48979.

*Phacelia crenulata* Torr. (Plates 512a, b, c)

HELIOTROPE PHACELIA. Locally frequent, below 7500 ft.; dry slopes and flats on gravel or sand. May-Jun (Jul). Hamlin Valley T10N R70E S 38° 44' 12", 114° 04' 32", †Coyote Canyon 742 630E 43 69 890N Clifton 48942, †Black Horse Canyon 734 230E 43 33 960N Clifton 48981.

*Phacelia hastata* Lehm.

a Plants prostrate, stem leaves very few to lacking, almost bract-like; flowers generally in tight balls. . . . . var. *alpina*

a Plants erect, caulescent, stem leaves well developed; flowers not as above. . . . . var. *hastata*

var. *alpina* (Rydb.) Cronq. (Plates 513a, b)

ALPINE SILVER-LEAVED PHACELIA. Frequent, 9000-12000 ft. open alpine rocky slopes and ridges. If these plants are

indeed this taxon than they are very different from the species and deserve taxonomic recognition. May-Aug. \*above Johnson Lake T13N R68E S36, †Baker Lake 732 730E 43 15 346N Clifton 40977, †Mt. Washington Road 733 040E 43 08 693N Clifton 36450.

var. *hastata* (Plates 514a, b)

SILVER-LEAVES PHACELIA. Infrequent, 7000-10000 ft.; sagebrush slopes, rocky slopes. Jun-Jul. !Buck Mountain T13N R68E S1, \*†Shingle Creek 729 255E 43 20 521N Clifton 45682, †Strawberry Creek 732 820E 43 26 413N Clifton 49015.

*Phacelia incana* A. Brand (Plates 515a, b)

HOARY PHACELIA. Infrequent, below 8200 ft.; open rocky slopes and gravelly openings in pinyon-juniper woodland, often on calcareous soils. May-Jun. The Troughs 739 345E 42 79 462N Clifton 43886, \*†South Fork Marble Wash 738 250E 43 65 430N Clifton 48922.

*Phacelia ivesiana* Torr. (Plates 516a, b)

IVES'S PHACELIA. Fairly frequent, below 7000 ft.; gravelly or sandy open places. Apr-May. \*Big Wash T12N R70E S27, \*Spring Valley T11E R68E S17, †Red Ledges 736 389E 42 83 270N Clifton 43979.

*Phacelia saxicola* A. Gray (Plate 517)

ROCK PHACELIA. Limited, about 5800 ft.; rock outcrops. May-Jun. Big Wash 755046E 4307982N Clifton 45661

*Phacelia sericea* (Graham) A. Gray

var. *ciliosa* Rydb. (Plate 518a, b)

SILKY PHACELIA. Infrequent, 7000-11000 ft.; talus slopes, rocky slopes, open woodland. Jun-Sep. !Bald Mountain T23N R68E S3, Shingle Creek 9400 ft. Raymond Jandl., †South Fork Baker Creek 737 724E 43 15 024N., Chalk Spring 738 254E 43 57 820N.

*Phacelia tetramera* J. T. Howell

FOUR PART PHACELIA. Quite infrequent, below 6000 ft.; moist alkaline flats and washes. \*The Cedars T12N R67E S2.

## HYPERICACEAE St. John's Wort Family

### HYPERICUM St. John's Wort

*Hypericum scouleri* Hook. (Plate 519)

SCOULER'S ST. JOHN'S WORT. Fairly frequent, 6000-10000 ft.; moist stream banks, meadows, less often in mesic woods. Jun-Aug. Baker Creek T13N R69E S14, !Burnt Mill Canyon T13N R69E S6, Lehman Creek 739 414E 43 21 868N.

## LAMIACEAE Mint Family

- 1 Stems conspicuously white-woolly. . . . . *Marrubium*
- 1 Stems otherwise
  - 2 Plants a shrub. . . . . *Salvia*
  - 2 Plants herbaceous
    - 3 Floral leaves and calyx spinulose toothed. . . . . *Dracocephalum*
    - 3 Floral leaves and calyx not as above
      - 4 Flowers in a single head. . . . . *Monardella*
      - 4 Flowers otherwise
        - 5 Leaves 3-5 cm long
          - 6 The stamens included. . . . . *Lycopus*
          - 6 The longer stamens exerted. . . . . *Mentha*
        - 5 Leaves 0.5-1.5 cm long; plants not a shrub. . . . . *Hedeoma*

### DRACOCEPHALUM

*Dracocephalum parviflorum* Nutt. (Plate 520)

AMERICAN DRAGONHEAD. Infrequent, 5700-8900 ft.; roadsides, open moist places. Jun-Aug. \*Baker Creek T13N R69E S21, !Lehman Creek T13N R69E S8. [*Moldavica p.* (Nutt.) Britt.].

### HEDEOMA False Pennyroyal

*Hedeoma drummondii* Benth. (Plates 521a, b)

DRUMMOND FALSE PENNYROYAL. Frequent, below 7600 ft.; crevices, rocky slopes. May-Sep. \*Lincoln Canyon T12N R68E S27, !Baker Creek Road 741 552E 43 20 181N.

#### LYCOPUS Bugleweed

*Lycopus asper* Greene (Plates 522a, b)

WESTERN WATER-HOREHOUND. Rare, about 5320 ft.; along streams. Jul. Lake Creek 758337E 4310640N Clifton 50456

#### MARRUBIUM

*Marrubium vulgare* L. (Plate 523)

HOARHOUND. Infrequent, below 7200 ft.; waste places; introduced from Europe. May-Sep. \*Spring Valley T13N R67E S33, !Lehman Creek T13N R69E S12.

#### MENTHA Mint

*Mentha canadensis* L. (Plates 524a, b)

AMERICAN CORNMINT, JAPANESE PEPPERMINT. Fairly frequent, below 7500 ft.; meadows and along streams. Jul-Sep. \*Highway 894 T13N R67E S23, !Baker Creek T13N R69E S14, !Grub Gulch T14N R68E S7, † Snake Creek 752 924E 43 12 116N, Hendrys Creek 751 400E 43 44 510N Clifton 47290. [*M. arvensis* L. misapplied as to our plants].

#### MONARDELLA Horsemint

*Monardella odoratissima* "complex" (Plates 525a, b)

MOUNTAIN HORSEMINT. Frequent, 8000-10,000 ft.; road banks, open woodland, open gravelly slopes. Many have tried their hand at separating this taxon into varieties and they haven't even remotely reached that point. The real *M. glauca* grows in a limited area and it is blue glaucous and has fine, short dense curved hair on both surfaces of the leaves, there are other differences also. These plants have the leaves essentially glabrous on both surfaces. There are plants in Mohave County that have glabrous leaves, but the flowers are smaller and corolla tube not nearly as exerted. It is very obvious that no one knows anything about this group of plants. Jun-Aug. Wheeler Peak Road 7 34 764E 43 24 249N, !Baker Creek T13N R69E S30, †Head of Pole Canyon 738 315 43 15 110.

#### SALVIA

*Salvia dorrii* (Kell.) Abrams

var. *dorrii* (Plate 526)

DORR'S SAGE. Limited, below 7500 ft.; open brushy slopes, and on valley floors. May-Jul. Near Big Springs Wash Road Raymond Jaendl

### LENTIBULARIACEAE Bladderwort Family

#### UTRICULARIA Bladderwort

*Utricularia macrorhiza* Leconte (Plate 528)

GREATER BLADDERWORT; COMMON BLADDERWORT. Limited, about 5767 ft.; small ponds. Late May-Jun. Blind Spring 724 798E 42 97 816N Clifton 45624. [*U. vulgaris* L. excluded by recircumscription].

### LINACEAE Flax Family

#### LINUM Flax

1 Flowers whitish to blue. . . . . *L. lewisii*  
1 Flowers yellow. . . . . *L. kingii*

*Linum kingii* S. Wats. (Plates 527a, b)

UNTA MOUNTAINS FLAX, PERENNIAL YELLOW FLAX. Limited to the Red Ledges area; 6400-6600 ft.; open pinyon-

juniper woodland in whitish to darker soil that is gravelly. Late May-early Jun. Red Ledges 736 500E 42 84 220N Clifton 45154

*Linum lewisii* Pursh (Plate 529a, b)

WESTERN BLUE FLAX. Frequent, below 9,000 ft.; desert slopes, dirt road margins, openings in sagebrush. May-Aug.

\*Lehman Caves 6800 ft. Raymond Jandl., Devils Gate Canyon 744630E 4372297N. [*L. perenne* L. ssp. *l.* (Pursh) Hult].

## LOASACEAE Loasa Family

### MENTZELIA Stick-leaf

- 1 Petals 30-80 mm long. . . . . *M. laevicaulis*
- 1 Petals 2-7 mm long
  - 2 Angles of the seeds not grooved. . . . . *M. albicaulis*
  - 2 Angles of the seeds grooved. . . . . *M. dispersa*

*Mentzelia albicaulis* Hook. (Plates 530a, b)

WHITE STEMMED STICK-LEAF. Fairly frequent, below 6500 ft.; open gravelly slopes, sandy places, along roads. Apr-Jul.

\*Hamlin Valley T10N R70E S12, !Lehman Creek T13N R69E S7, †Coyote Canyon 739 870E 43 67 150N Clifton 48936.

*Mentzelia dispersa* S. Wats. (Plate 531)

NADA STICK-LEAF. Below 8500 ft.; dry slopes in opening, roadsides, under shrubs. There are named varieties of this taxon, but in California none of them are recognized. Ours is called var. *compacta* (A. Nels.) J. F. Macbr. if one is so inclined. Grows in the Schell Creek Range, should be here. Jun-Jul.

*Mentzelia laevicaulis* (Hook.) T. & G. (Plates 532a, b)

SMOOTHSTEM BLAZING STAR. Infrequent, below 8000 ft.; mine dumps, road banks, rocky slopes. There is a named variety along the Columbia River that has been lumped, however it looks enough different to be kept as a variety. Jul-Sep. \*Mt. Wheeler Mine 731031E 4308770N.

## LYTHRACEAE Loosestrife Family

### ROOTALA

*Rotala ramosior* (L.) Koehne

TOOTH-CUP. Limited, below 6800 ft.; wet meadows on drying mud. The styles are 1 mm long on these plants. These plants are often very small and easily overlooked. Jul-Aug. \*The Cedars T13N R67E S34.

## MALVACEAE Mallow Family

- 1 Petals red-orange. . . . . *Sphaeralcea*
- 1 Petals not as above
  - 2 Leaves very shallowly lobed, almost round in outline, crenate. . . . . *Malva*
  - 2 Leaves maple-shaped or at least the upper deeply divided
    - 3 Leaves dimorphic, upper leaves deeply divided, lower shallowly lobed. . . . . *Sidalcea*
    - 3 Leaves all about the same shape, (maple shaped). . . . . *Iliamna*

### ILIAMNA Globe Mallow

*Iliamna rivularis* (Hook.) Greene

WILD GLOBE MALLOW, WILD HOLLYHOCK. Infrequent, 7600-9500 ft.; along roads and streambanks. Have not been able to relocate this site. It may not be a member of this flora anymore. The plants in this part of Nevada are found along roads and would make you think that they are introduced. Jun-Aug. !Wheeler Peak Road T13N R69E S6.

### MALVA

*Malva neglecta* Wallr. (Plates 533a, b)

DWARF MALLOW. Infrequent, below 8100 ft. along roads, waste places; introduced from Eurasia. May-Oct. \*Baker T13N R70E S9, \*Baker Creek 739 740E 43 19 290N Clifton 49034.

**SIDALCEA** Checkerbloom, Checker Mallow

- 1 Petals white, yellowish, cream, sometimes purple tinged; stems glabrous. . . . . *S. candida*  
 1 Petals pink; stems with some hairs. . . . . *S. neomexicana*

*Sidalcea candida* A. Gray (Plates 534a, b)

WHITE-FLOWED CHECKERBLOOM. Locally frequent, 7400-10000 ft.; along creeks in the riparian Jul-Sep. !Lehman Creek T13N R69E S8, Clifton 11719, †Baker Creek 738 636E 43 17 440N Clifton 41051.

*Sidalcea neomexicana* A. Gray

var. *crenulata* (A. Nels.) C. L. Hitchc. (Plates 535a, b)

SUBALKALI MEADOW CHECKERBLOOM. Infrequent, below 6800 ft.; subalkali meadows, along streams that are associated with subalkali meadows. Mid Jun-Jul. \*Hamlin Valley T10N R70E S1, Strawberry Creek 738 064E 43 27 850N Clifton 51341.

**SPHAERALCEA**

*Sphaeralcea grossulariifolia* (H. & A.) Rydb. (Plates 536a, b)

CURRENT LEAF DESERT MALLOW. Fairly frequent, below 7500 ft.; washes, openings in pinyon-juniper, desert slopes. May-Oct. \*Snake Creek 747 970 43 11 482 Clifton 43007, Coyote Canyon 742 400E 43 69 655N.

**MONOTROPACEAE** Indian-pipe Family**PTEROSPORA**

*Pterospora andromedea* Nutt.

PINEDROPS. Infrequent, 7500-9000 ft.; open forest floors. Jun-Aug. !Lehman Creek T13N R68E S12.

**MYRSINACEAE** Myrsine Family

**Note:** This group has long been in Primulaceae where they were out of place. The following two genera have recently been placed in *Lysimachia* which of course this author doesn't believe for a second.

- 1 Plants annual; petals shorter than the calyx. . . . . *Centunculus*  
 1 Plants perennial; petals longer than the calyx. . . . . *Glaux*

**CENTUNCULUS**

*Centunculus minimus* L. (Plates 537a, b, c)

CHAFF-WEED. Rare, 5900-6,000 ft.; moist sandy-loam on the margin of streams. This is apparently a new record for Nevada. There is enough difference between this genus and *Anagallis* to leave them different. Collection #11722 site has been altered, only a few plants are evident. May-Jul. \*Lehman Creek 745 281E 43 21 267N Clifton 11722, †Lehman Creek 745 152E 43 21 680N Clifton 52152. [*Anagallis m.* (L.) Krause, *Lysimachia m.* (L.) Manns & Anderb.].

**GLAUX**

*Glaux maritima* L. (Plates 538)

SEA-MILKWORT. Fairly frequent, below 6700 ft.; moist saline meadows and springs. Jun-Aug. Hamlin Valley T10N R70E S12, The Cedars T12N R67E S2, Willow Patch Springs T15N R68E S36, \*Lake Creek 760 029E 43 06 700N Clifton 49023. [*Lysimachia m.* Galasso, Banfi & Soldano].

**NYCTAGINACEAE** Four O'clock Family

- 1 Stigma linear, included in the perianth. . . . . *Abronia*

- 1 Stigma capitate, exerted from the perianth. . . . . *Mirabilis*

#### ABRONIA Sand-Verbena

- 1 Leaves essentially all basal. . . . . *V. nana*  
 1 Leaves along the stem. . . . . *A. elliptica*

*Abronia elliptica* A. Nels. (Plates 539a, b, c)

FRAGRANT SAND-VERBENA. Infrequent, below 7500 ft.; sandy places. Jun-Aug. Highway 894 T13N R67E S14, †\*Marble Wash 241953E 4366510N Clifton 48965. [*A. fragrans* Nutt. es Hook., misapplied, *A. salsa* Rydb.].

*Abronia nana* S. Wats. (Plates 540a, b)

var. *nana*

LOW SAND-VERBENA. Quite infrequent, 3500-6000 ft.; limestone cliche in open pinyon-juniper woodland. Jun-Jul. North of \*Red Ledges 736 060E 42 84 870N Clifton 51281.

#### MIRABILIS Four O'clock

- 1 The leaves broadly ovate to round  
 2 The perianth 40-60 mm long; leaves green. . . . . *M. multiflora*  
 2 The perianth 15-16 mm long; leaves glaucous. . . . . *M. alipes*  
 1 Involucre less than 31 mm  
 3 Leaves wider than linear-lanceolate (our area). . . . . *M. sp.*  
 3 Leaves linear to linear-lanceolate. . . . . *M. linearis*

*Mirabilis* 'acutifolia' (Plate 609)

GREAT BASIN FOUR-O'CLOCK. Infrequent, below 6200 ft.; rocky slopes. This taxon is part of a very polymorphic complex, which in the latest works has had a great disservice done to it. There are a lot of correlatable characters that can be used to separate the various taxa that are within this group. These plants in this area have the stems with curled hairs that face upward and are not glandular. The leaves are narrowly elliptic and glabrous. The flowers are axillary. This fits no described taxon with in this group. Jun. \*Tungsten Queen Road 728 457E 42 99 433N Clifton 45147.

*Mirabilis alipes* (S. Wats.) Pilz (Plate 541)

WATSON'S or WINGED FOUR-O'CLOCK. Infrequent, below 6300 ft.; rocky washes, slopes and canyons. May-Jun. Strawberry Creek T14N R69E S16. [*Hermidium a.* S. Wats.]

*Mirabilis linearis* (Pursh) Heimerl

var. *linearis* (Plates 542a, b, c)

NARROW-LEAVED FOUR O'CLOCK or UMBRELLAWORT. Infrequent, below 7500 ft.; openings in sagebrush on rocky to fine gravel. Jul-Sep. \*Highway 488 T13N R70E S9.

*Mirabilis multiflora* (Torr.) A. Gray (Plate 543)

HAIRLESS COLORADO FOUR-O'CLOCK. Limited, openings in pinyon-juniper woodland. The variety *glandulosa* is essentially indistinguishable where it grows with the species. The fruit is the only way to tell them apart, however since in another complex within this genus, the fruit was completely ignored, it will be ignored in this complex. Mid Jun-Mid Jul. Murphy Wash, \*Red Ledges 736 060E 42 84 870N Clifton 51282. [var. *glandulosa* (Standl.) J. F. Macbr.].

### ONAGRACEAE Evening-primrose Family

- 1 Petals 1-5 cm long  
 2 Petals pink-purple. . . . . *Chamerion*  
 2 Petals white, or yellow (sometimes drying pinkish)  
 3 Stigma linear-lobed. . . . . *Oenothera*  
 3 Stigma a fairly flat disk. . . . . *Calylophus*  
 1 Petals 1 cm or shorter, if 1 cm long not pink-purple  
 4 Sepals deflexed  
 5 Petals white or yellow. . . . . *Camissonia*  
 5 Petals pink. . . . . *Gayophytum*  
 4 Sepals erect. . . . . *Epilobium*

### CALYLOPHUS Primrose

#### *Calylophus lavandulifolius* (T. & G.) Raven (Plates 544a, b)

GRAY LEAF PRIMROSE. Infrequent, below 8000 ft.; rocky slopes, often in crevices, most often of limestone origin. There are plants in other places that look somewhat different and the fruit is stipitate at the base. Our plants, the fruit is sessile and the flowers are much smaller. Jun-Jul. \*Grub Gulch T14N R68E S5, \*† Snake Creek 743 079 43 11 439.

### CAMISSONIA

**Note:** The people who are playing with this group are making them into a number of genera, however it is meaningless. They should be taking care of getting the taxa straightened out first.

- 1 Pedicels well developed when in fruit
  - 2 The largest leaves up to 1.5 cm long, subsessile. . . . . *C. pterosperma*
  - 2 The largest leaves well over 1.5 cm long with a well developed petiole
    - 3 Flowers whitish. . . . . *C. claviformis*
    - 3 Flowers yellow
      - 4 The base of the stigma among the anthers; fruit not much over 5 time longer than wide; flowers bright yellow
        - . . . . . *C. scapoidea*
      - 4 The base of the stigma above the anthers; fruit well over 15 time longer than wide; flowers dull yellow
        - . . . . . *C. 'pseudomultijuga'*
- 1 Pedicels not evident
  - 5 Petals yellow. . . . . *C. pusilla*
  - 5 Petals white, often fading to pink
    - 6 Petals 4-9 mm long. . . . . *C. boothii*
    - 6 Petals 1-2 mm long. . . . . *C. minor*

#### *Camissonia boothii* (Dougl. ex Lehm.) Raven

var. 'strigulosa' (Plates 545a, b, c)

BOOTH'S ASCENDING FRUIT EVENING PRIMROSE. Infrequent, below 7200 ft.; sandy to gravelly places. These plants have fairly straight capsules like var. *villosa*, but have short strigulose hairs. They try to say that these are a cross, however since all of our plants are this way, they can not be a cross. Throughout the range of this group of plants there are a number of forms that have no names. May-early Jul. \*Hamlin Valley T10N R70E S13, †Smith Creek 750445E 4357970N Clifton 48968, †Black Horse Canyon 734315E 4333867N Clifton 48982, †Big Wash 743 204E 43 08 358N Clifton 51323.

#### *Camissonia claviformis* (Torr. & Frém.) Raven

var. *purpurascens* (S. Wats.) Cronq. (Plates 546a, b)

CLAVATE FRUIT EVENING PRIMROSE. below 6500 ft. May-Jul. †South Highland Road 725 568E 42 96 300N Clifton 43947.

#### *Camissonia minor* (A. Nels.) Raven (Plates 547a, b)

DWARFED EVENING PRIMROSE. Infrequent, below 6000 ft.; dry sandy places. \*Hamlin Valley T10N R70E S12, †Hamlin Valley 751 700E 42 87 587N Clifton 43891, South Highland Road 725 568E 42 96 300N.

#### *Camissonia* 'pseudomultijuga' (Plates 551a, b)

These plants would fit *C. multijuga* except the petals are way to small and the leaves are not pinnatifid. Some of the plants look like they have some genes from *C. scapoidea*. Marble Wash 745573E 4369727N Clifton 48955, Marble Wash 748470E 4369720N Clifton 48961.

#### *Camissonia pterosperma* (S. Wats.) Raven (Plates 549a, b)

WING SEEDED EVENING PRIMROSE, Infrequent, below 7000 ft.; dry sandy or fine gravel slopes and flats. May-Jun. \*Hamlin Valley T10N R70E, S. South Highland Road 725 568E 42 96 300N, †Black Horse Canyon 734230E 4333960N Clifton 48977.

#### *Camissonia pusilla* Raven (Plates 548a, b)

SMALL EVENING PRIMROSE. Fairly frequent, below 7000 ft.; dry sandy places. \*Spring Valley T13N R67E S10, \*Big Springs Wash T10N R69E S20, †South Highland Road 725 568E 42 96 300N Clifton 43946, †Baker Creek Road 741 430E 43 20 790N Clifton 51249.

#### *Camissonia scapoidea* (Plates 550a, b)

SMALL-FLOWERED EVENING PRIMROSE. Very infrequent, below 6300 ft.; barren soil in chenopod scrub, gravelly alluvium on slopes. Mid May-Jun. Gandy Road 758 488E 43 48 200N Clifton 51299.

## CHAMERION

*Chamerion angustifolium* (L.) Scop. (Plate 552)

FIREWEED. Fairly frequent, 6500-11000 ft.; mesic slopes, along streams, canyons. The variety is meaningless as there are many places where it is essentially like the species. Jul-Sep. branch of Lincoln Canyon T12N R68E S21, !Lehman Creek T13N R69E S8, \*Baker Creek 7500 ft. Raymond Jaindl. [*Epilobium a. L. ssp. circumvagum* Mosq., var. *canescens* (Atwood) N. H. Holmgren & P. K. Holmgren].

## EPILOBIUM

**Note:** Most plants in this group combine characters of several species making the keys and plant descriptions meaningless. All the perennial plants are N=36. Almost all the plants this author has in his own herbarium that look like *E. alpinum* are essentially glabrous except the fruit. They are supposed to have puberulent hairs in lines decurrent from the leaf bases and the upper part generally puberulent and often  $\pm$  glandular hairy. There will be numerous plants that will not fit a specific named taxon. This author is not sure how many of the plants collected in the Range are identified correctly.

- 1 Plants annual. . . . . *E. brachycarpum*
- 1 Plants perennial
  - 2 Plants with new shoots originating from ordinary leaf axils at or just below ground surface these acting as very short stolons than turning up creating new stems, this is easily seen if plants collected in a clump (soboliferous); lacking winter-buds
    - 3 Herbage glaucous. . . . . *E. glaberrimum*
    - 3 Herbage not glaucous
      - 4 Stems often strongly curved or sigmoid, up to 2 dm tall; capsules 1.7-3.5 (4) mm long. . . . . *E. alpinum*
      - 4 Stems mostly erect, most often taller than the above; capsules 4-10 mm long. . . . . *E. hornemannii*
  - 2 Plants otherwise
    - 5 Plants fairly coarse; leaves usually prominently serrulate; seeds longitudinally rather finely ridged at 20X; petals mostly 6-10 mm long. . . . . *E. ciliatum*
    - 5 Plants not combining the above characters. . . . . *E. halleanum*

*Epilobium alpinum* L.

- a Fruit narrow, about 1 mm thick, seldom as much as 1.5 mm thick; inflorescence nodding; seed netted, 0.7-1.4 mm long. . . . . var. *alpinum*
- a Fruit thicker, 1.3-1.7 mm; inflorescence erect; seeds papillate, 1.5-2.1 mm long. . . . . var. *clavatum*

var. *alpinum*

ALPINE WILLOW-HERB. Frequent, 9000-12000 ft.; mesic rocky slopes and crevices, alpine turf. alpine meadows. Jul-Sep. \*Wheeler Peak T13N R68E S14, \*Mount Washington T12N R68E S11, †Lehman Creek 733 167E 43 21 075N.

var. *clavatum* (Trel.) C. L. Hitchc.

THICK-FRUITED ALPINE WILLOW-HERB. Infrequent, 9000-11500 ft.; mesic, steep rocky slopes and rocky crevices. Apparently this taxon is only found in the Snake Range in Nevada. Jul-Aug. \*Highland Ridge 734 750E 43 06 771N, †Baker Lake 732 730E 43 15 346N Clifton 40979.

*Epilobium brachycarpum* C. Presl (Plates 553a, b)

PANICLED WILLOW-HERB. Infrequent, 7500-8500 ft.; open rocky slopes. Jul-Aug. \*Baker Creek 738 345E 43 18 732N.

*Epilobium ciliatum* Raf (Plates 554a, b, c)

AMERICAN WILLOW-HERB. Frequent, below 9000 ft.; moist places. Since the only sure way to separate var. *glandulosum* is to dig the roots, this author doesn't recognize it. Jun-Aug. \*Baker Creek 738 611E 43 18 257N, †Turnley Canyon 729 201E 43 37 857N, !Burnt Mill Canyon T13N R69E S6. [var. *glandulosum* (Lehm.) Dorn].

*Epilobium glaberrimum* Barbey

GLAUCOUS or SMOOTH WILLOW-HERB. Infrequent, 6500-9500 ft.; moist to wet places. This taxon was reported for this range, however this author has never found it. Jun-Aug.

*Epilobium halleanum* Hausskn.

HALL'S or GLANDULAR WILLOW-HERB. Infrequent, 8000-10700 ft.; wet places. The plants on Highland Ridge have no glandular hair and show an affinity for one of the other species. The seeds are that of this taxon along with the winter buds. The plants on Baker Creek have the fruit glandular hairy. Some of the plants on Wheeler Peak Road appear to be annual. Jun-Aug. †Highland Ridge 7 31 378E 43 07 738N, \*Baker Creek 734 400E 43 15 450N Clifton 41008, †Wheeler Peak Trail 732 400E

43 21 379N, †Wheeler Peak Road 738 110E 43 22 760N Clifton 48872.

*Epilobium hornemannii* Reichenb.

- a Flowers white (less often pink) 2-4 (5) mm long. . . . . var. *lactiflorum*  
 a Flowers pink to pink-purple 5-8 mm long. . . . . var. *hornemannii*

var. *hornemannii* (Plate 555)

HORNEMANN'S WILLOW-HERB. Fairly frequent, 8000-11000 ft.; moist to wet places. Jun-Aug. \*Lehman Creek T13N R68E S11, †Baker Creek 738 611E 43 17 481N, †Pyramid Peak 733 935E 43 14 785N.

var. *lactiflorum* (Hauskn.) D. Löve

WHITE-FLOWERED ALPINE WILLOW-HERB. 9000-10,000 ft.; moist to wet places. Jul-Aug. \*Baker Lake 732 780E 43 15 200N Clifton 40980.

#### GAYOPHYTUM Groundsmoke

- 1 Pedicels lacking or not much longer than 2 mm (5 mm); inflorescence starting at 1st-3rd nodes  
 2 Fruit ± terete; on well developed plants the branches below and above the middle. . . . . *G. decipiens*  
 2 Fruit flattish; on well developed plants the branches below the middle. . . . . *G. racemosum*  
 1 Pedicels 2 mm to much longer; inflorescence starting at least above the 4th node  
 3 Pedicels as long or longer than the mature fruit; petals mostly less than 1.5 mm long. . . . . *G. ramosissimum*  
 3 Pedicels usually shorter than the mature fruit; petals with most of them 1.5 mm or longer. . . . . *G. diffusum*

*Gayophytum decipiens* F. H. Lewis & Szweyk. (Plate 556)

LEAST DIFFUSE Groundsmoke. Infrequent, 6200-9500 ft.; edges of meadows, moist places, sometimes on dry slopes. Jun-Aug. \*Wheeler Peak Road T13N R69E S6, †Grub Gulch 728 262E 43 30 614N Clifton 45206.

*Gayophytum diffusum* T. & G.

var. *strictipes* (Hook.) Dorn (Plates 557a, b, c)

DIFFUSE GROUNDSMOKE. Frequent, 6200-10000 ft.; dry to sometimes moist, open or lightly wooded slopes, openings in sagebrush. May-Aug. \*Snake Creek T12N R69E S8.

*Gayophytum racemosum* T. & G. (Plate 558)

BLACKFOOT GROUNDSMOKE. 6500-9500 ft.; moist to dry places, along streams openings in sagebrush. May-Aug. \*Wheeler Peak Road 738 110E 43 22 760N Clifton 48875

*Gayophytum ramosissimum* T. & G. (Plate 559)

MUCH-BRANCHED GROUNDSMOKE. 6000-8500 ft.; dry, open places, often sandy. May-Aug. Kious Basin 6700 ft. Raymond Jaindl.

#### OENOTHERA Evening-primrose

- 1 Flowers yellow  
 2 Plants lacking leafy stems  
 3 Sepals 1-2 cm long; petals 1.5-2.5 cm long. . . . . *O. flava*  
 3 Sepals 3-7 cm long; petals 3.5-7.3 cm long. . . . . *O. howardii*  
 2 Plants with well developed leafy stems. . . . . *O. elata*  
 1 Flowers white  
 4 Flowers inserted in the leaf rosette. . . . . *O. caespitosa*  
 4 Flowers inserted on the stem above basal leaves. . . . . *O. pallida*

*Oenothera caespitosa* Nutt.

- a Floral tube generally 7-14 or more mm long; petals turning pink in age (seldom darker). . . . . var. *marginata*  
 a Floral tube generally 3.5-7 mm long; petals turning very dark in age. . . . . var. *crinita*

var. *crinita* (Rydb.) Munz (Plate 560)

SMALL FLOWERED FRAGRANT EVENING PRIMROSE. \*Spring Valley T13N R67E S10 (wrong name in the Park Herbarium) Marble Wash 748470E 4369720N Clifton 48960.

var. *marginata* (H. & A.) Munz (Plate 561)

CAESPITOSE EVENING-PRIMROSE, SAND-LILY. Fairly frequent, below 9000 ft.; fairly dry places, from sandy to gravelly

soil. May-Jul. Lehman Caves T13N R69E S15, Snake Creek 6600 ft. Raymond Jandl, Chalk Spring 738 254E 43 57 820N.

***Oenothera elata*** Kunth

var. *hirsutissima* (S. Wats.) Cronq. (Plates 562a, b)

HAIRY or WESTERN EVENING-PRIMROSE. Infrequent, below 9000 ft.; moist places. May-Sep. !Lehman Creek T13N R69E S8, \*Snake Creek 7600 ft. Raymond Jandl, †Snake Creek 746 052E 43 10 600N Clifton 41059, †Strawberry Creek 738 090E 43 27 670N Clifton 49019. [*O. hookeri* T. & G. var. *angustifolia* R. Gates].

***Oenothera flava*** (A. Nels.) Garrett

var. *flava* (Plate 563)

DANDELION-LIKE EVENING-PRIMROSE. Infrequent, below 7000 ft.; drying depressions, flats, poorly drained soil. Jun-Jul: \*The Cedars T13N R67E SW34, !Lehman Creek T13N R69E S8, Spring Valley 722 585E 43 01 215N Clifton 45647.

***Oenothera howardii*** (A. Nels.) W. L. Wagner (Plate 564)

HOWARD'S EVENING-PRIMROSE. Infrequent, 7000-9400 ft.; dry rocky slopes. Late May-early Jul. \*Decathon Canyon 738 116 42 97 223 Clifton 45228, \*Big Spring Wash 740 478E 43 00 280N (NAD 83) Clifton 49043, Big Spring Wash 740 560E 43 01 885N (NAD 83).

***Oenothera pallida*** Lindl. (Plates 565a, b)

a Herbage green, essentially glabrous. . . . . var. *pallida*  
a Herbage whitish-green, densely strigose. . . . . var. *runcinata*

var. *pallida*

PALE EVENING-PRIMROSE. Infrequent, below 8500 ft.; sandy places. May-Sept. \*Snake Creek T12N R69E S9, †Snake Creek 743 866 43 10 980.

var. *runcinata* (Engelm.) Cronq.

HAIRY PALE EVENING PRIMROSE. Infrequent, below 7500 ft.; sandy places, sometimes in disturbed places. May-Jul. \*Baker 748 787E 43 22 316N Clifton 44000.

## OROBANCHACEAE Broom-rape Family

### OROBANCHE Broom-rape, Cancer-root

**Note:** It is being found that each species is limited to a specific host. This means that the names below may mean nothing.

- 1 Flowers 1-several borne on long slender pedicels; lacking bracts
- 2 Flowers several per plant. . . . . *O. fasciculata*
- 2 Flowers single. . . . . *O. uniflora*
- 1 Flowers many, pedicels much shorter; bracts at least 2
- 3 Inflorescence an elongated spike; plants normally over 1 dm tall. . . . . *O. ludoviciana*
- 3 Inflorescence corymbose, broom-like; plants to 1 dm tall
- 4 Anthers woolly; lower lobes of corolla with yellow patches at their base. . . . . *O. corymbosa*
- 4 Anthers glabrous; lower lobes lacking yellow patches at their base. . . . . *O. karteszii*

***Orobanche corymbosa*** (Rydb.) Ferris (Plates 566a, b)

RYDBERG'S BROOM-RAPE. Infrequent, below 8500 ft.; slopes and flats in sagebrush. The plants at Baker Creek have a more elongate inflorescence than normal. May-Jul: \*Strawberry Creek T14N R69E S21, †Baker Creek 738 564E 43 18 171N, !Lehman Creek T13N R69E S8, \*Pole Canyon 8400 ft. Raymond Jandl.

***Orobanche fasciculata*** Nutt. (Plates 567a, b, c)

CLUSTERED CANCER-ROOT. Infrequent, below 8000 ft.; slopes and flats in sagebrush. May-Jun. !Baker Creek T13N R69E S14, \*Snake Creek 9010 ft. Raymond Jandl, †Highway 894 726 265E 43 04 952N Clifton 43938, Rye Grass Canyon 734 775E 43 61 540N Clifton 48912.

***Orobanche karteszii*** Mozingo

KARTESZ BROOM-RAPE. Limited, 7000-8000 ft.; slopes. No ones recognizes these plants, but are left here because they are somewhat different. Sep.-Oct. Grub Gulch 725 866E 43 30 371N.

***Orobanche ludoviciana*** Nutt. (Plate 568)

SUKSDORF'S BROOM-RAPE. Infrequent, below 7500 ft.; subalkaline soil on valley floors, gravelly to sandy soil on lake margins, often on *Iva*. Jul-Sep. \*Baking Powder Flat 722 640E 43 01 260N Clifton 52110, †Pruess Lake 759716E 4307710N Clifton 49030.

***Orobanche uniflora* L. (Plate 569)**

NAKED BROOM-RAPE. Quite infrequent, 6500-9500 ft.; moist slopes, under the margin of large boulders. May-Jul. \*Between Jeff Davis Peak and Baker Creek 736 960E 43 19 260N (NAD 83) Clifton 49037.

**PAPAVERACEAE** Poppy Family**ARGEMONE** Prickly Poppy***Argemone munita* Dur. & Hilg.**

var. *rotundata* (Rydb.) Shinn. (Plate 570)

BROAD-HORNED PRICKLY POPPY. Fairly frequent, below 8000 ft; burns, open slopes, along roads. May-Aug. \*Lehman Creek 741 517E 43 21 282N. [ssp. *rotundata* (Rydb.) Ownbey].

**PARNASSIACEAE** The Grass-of-Parnassus Family**PARNASSIA*****Parnassia parviflora* DC. (Plate 571)**

SMALL-FLOWERED GRASS-OF-PARNASSUS. Rare, about 6320 ft.; wet meadows. Some make this a species. Aug-Sep. †Baker Creek 743 570E 43 20 182N. [*P. palustris* L. var. *p.* (DC) Boivin].

**PHILADELPHACEAE** Mock Orange Family

**Note:** Some put this in Hydrangeaceae

- 1 Leaves generally bearing some teeth, dark green on the upper surface; petals bearing some hairs. . . . . *Jamesia*  
 1 Leaves entire, light green on the upper surface; petals lacking hair. . . . . *Philadelphus*

**JAMESIA*****Jamesia tetrapetala* N. Holmgren & P. Holmgren (Plates 572a, b)**

WAXFLOWER. Fairly frequent, 7000-11300 ft.; steep rocky slopes, cliff sides. The type locality is Lincoln Canyon. Jun-Jul: \*branch of Lincoln Canyon T12N R68E S27, †branch of North Fork Big Wash 736 472E 43 07 863N Clifton 44539, †South Fork Big Wash 737 530E 43 05 922N Clifton 45256.

**PHILADELPHUS*****Philadelphus microphyllus* A. Gray (Plates 573a, b)**

LITTLELEAF or DESERT MOCK-ORANGE. Limited, 6200-6400 ft.; dry, gravelly or rocky places in canyon, in crevices. Jun-Jul. Marble Wash 744683E 4370210N Clifton 48951

**PLANTAGINACEAE****PLANTAGO**

- 1 Leaves broadly lanceolate; stamens long exerted, very conspicuous. . . . . *P. lanceolata*  
 1 Leaves broadly elliptic or somewhat cordate; stamens inconspicuous. . . . . *P. major*

***Plantago lanceolata* L. (Plates 574a, b)**

ENGLISH PLANTAIN. Infrequent, below 5500 ft.; waste places, sometimes invading native habitat; introduced. \*Baker 749300E 4321700N Clifton 48867

***Plantago major* L. (Plates 575a, b)**

COMMON PLANTAIN. Infrequent, below 7000 ft.; moist places; introduced from Europe. May-Jul. \*The Cedars T12N R67E S2, †Lake Creek 760029E 4306700N Clifton 49024.

## POLEMONIACEAE Phlox Family

**Note:** A number of genera have been re-aligned, but it just makes for more confusion, so mostly tradition is follow here.

- 1 Leaves entire
  - 2 Plants annual
    - 3 Flowers on capillary pedicels that are widely spreading to deflexed. . . . . *Gilia*
    - 3 Flowers almost sessile, pedicels very short and quite thick
      - 4 Leaves ± opposite. . . . . *Microsteris*
      - 4 Leaves alternate
        - 5 Sepals 1.5-3 mm long in flower; corolla 8-15 mm long. . . . . *Collomia*
        - 5 Sepals 3.5-6; corolla 5-8 mm long. . . . . *Ipomopsis*
  - 2 Plants perennial. . . . . *Phlox*
- 1 Leaves serrate, dentate, pinnate or palmate
  - 6 Plants with the leaves palmate, sessile; lobes pungent; subshrub. . . . . *Leptodactylon*
  - 6 Plants not combining the above characters
    - 7 Plants annual
      - 8 Plants with well developed leaves in the inflorescence. . . . . *Ipomopsis*
      - 8 Plants with the inflorescence leafless. . . . . *Gilia*
    - 7 Plants perennial
      - 9 Flowers blue-violet. . . . . *Polemonium*
      - 9 Flowers scarlet or white. . . . . *Ipomopsis*

### COLLOMIA

- 1 Corolla 8-15 mm long, tube exerted from the calyx. . . . . *C. linearis*
- 1 Corolla 4-6 mm long, tube included in the calyx. . . . . *C. tenella*

*Collomia linearis* Nutt. (Plate 576)

NARROW LEAF COLLOMIA. Frequent, below 9500 ft.; openings in sagebrush, lightly shaded places. May-Aug. !Burnt Mill Canyon T13N R69E S6, \* Timber Creek 738 643 43 17 067, †Strawberry Creek 733500E 4326192N Clifton 49011.

*Collomia tenella* A. Gray (Plate 577)

DIFFUSE MOUNTAIN-TRUMPET. Fairly infrequent, about 7000-7200 ft.; mesic places below cliffs and in pinyon-juniper woodland in vernal moist places. Mid Jun-Jul. \*Lehman Caves 740 580E 43 21 330N Clifton 51326.

### ERIASTRUM

**Note:** Not sure if the below two are real. *E. signatum* is supposed to have a purplish spot at the base of the petals and *E. wilcoxii* is not. In the plants from this area the plants with the corolla lobes that are wider than 1.25 mm also have a purplish spot and often with a purplish line extending down the throat from the spot. As the photos show the color of *E. wilcoxii* is not right, should be bluish.

- 1 Stamens unequal; the longest filaments at least twice as long as the anther; corolla lobes usually over 1.25 mm wide
  - . . . . . *E. wilcoxii*
- 1 Stamens equal; the filaments less than twice as long as the anthers; corolla lobes 1.25 mm or less wide. . . . . *E. signatum*

*Eriastrum signatum* D. Gowen (Plate 578)

FEW-FLOWERED ERIASTRUM. Fairly infrequent, below 7000 ft., sandy openings in pinyon-juniper woodland. Jun-Jul. Baker Creek Road 741 430E 43 20 790N Clifton 51252.

*Eriastrum wilcoxii* (A. Nels.) Mason (Plates 579a, b)

WILCOX'S ERIASTRUM. Infrequent, below 7000 ft.; dry sandy sagebrush slopes, valley floors. South Highland Road 722 425E 42 94 810N Clifton 51236.

### GILIA

**Note:** Since the group of plants from section *Arachnion* (cobwebby gilias) are by in large self pollinated, one would think that they

would remain fairly consistent in how they look. However there are a large number of plants throughout their range that don't conform to the named taxa, if in truth the descriptions are right, which is doubtful. This author suspects that at various times they may outcross, thus creating numerous plants that don't fit in any described taxon. Often plants from one area don't look like plants from some other area, even though they seem to key out to the same taxon. Some of the taxa are now being put into different genera, which may be justifiable in the mind of some.

- 1 Herbage bearing some cobwebby hairs, sometimes limited to the leaf axils
  - 2 Lower stems glabrous, ± glaucous. . . . . *G. sinuata*
  - 2 Lower stems cobwebby to gland dotted, not glaucous
    - 3 The corolla tube well exerted. . . . . *G. ophthalmoides*
    - 3 The corolla normally included
      - 4 The corolla lobes not yellow. . . . . *G. inconspicua*
      - 4 The corolla lobes yellow. . . . . *G. 'canarina'*
- 2 Plants lacking cobwebby hair
  - 5 Herbage collecting sand grains because it is very glandular. . . . . *G. hutchinsifolia*
  - 5 Herbage not as above
    - 6 Leaves essentially entire; pollen yellow; corolla lobes entire. . . . . *G. tenerrima*
    - 6 Leaves not entire; pollen white; corolla lobes mucronate to 3-toothed
      - 7 Lobes of corolla 3-dentate, middle tooth the longest. . . . . *G. triodon*
      - 7 Lobes of corolla not as above
        - 8 Plants on the larger side; corolla generally 3-7 mm long; calyx 2-3 mm long. . . . . *G. leptomeria*
        - 8 Plants on the small side; corolla generally 2-3.5 mm long; calyx 1-2.5 mm long. . . . . *G. micromeria*

***Gilia brecciarum*** A. Gray

var. *brecciarum* (Plates 580a, b)

NEVADA GILIA. Fairly infrequent, below 7000 ft.; sandy openings in pinyon-juniper woodland. Jun-early Jul. Baker Creek Road 741 430E 43 20 790N Clifton 51251.

***Gilia 'canarina'*** (Plates 585a, b)

CANARY YELLOW GILIA. Rare, below 7000 ft.; sandy-gravel in openings in scrub. As the photo shows the flowers have the throat yellow green and the lobes pale yellow. Late May-Jun.

***Gilia hutchinsifolia*** Rydb. (Plates 581a, b, c)

HUTCHINS' GILIA. Frequent, below 6800 ft.; sandy or gravelly slopes and flats. May-Jun. \*Spring Valley T13N R67E S10, \*Big Wash T12N R70E S27. [*Aliciella h.* (Rydb.) J. M. Porter].

***Gilia inconspicua*** (Sm.) Sweet (Plates 582a, b)

INCONSPICIOUS GILIA. Fairly frequent, below 7500 ft.; sandy to gravelly slopes and flats. May-Jun. \*Spring Valley T13N R67E S10, Strawberry Creek 7360 Raymond Jandl, †Snake Creek 748 501 43 11 559, †Highway 894 726 265E 43 04 952N Clifton 43932, The Troughs 739345E 4279462N Clifton 43882.

***Gilia leptomeria*** A. Gray (Plates 583a, b, c)

GREAT BASIN GILIA. Infrequent, below 7500 ft.; sandy places. May-Jun. \*Hamlin Valley T10N R70E S13, †Coyote Canyon 739 077E 43 67 246N Clifton 48934, \*Baker Creek Road 741 430E 43 20 790N Clifton 51250. [*Aliciella l.* (A. Gray) J. M. Porter].

***Gilia micromeria*** A. Gray (Plates 584a, b)

DAINTY GILIA. Limited, 5718 ft.; alkaline valley floors, often under shrubs. May-Jun. †Spring Valley 719 520E 43 26 915N Clifton 44015. [*Aliciella m.* (A. Gray) J. M. Porter].

***Gilia ophthalmoides*** Brand (Plates 586a, b)

EYELIKE GILIA. Fairly frequent, below 8400 ft.; rocky and gravelly slopes. May-Jun., \*Snake Creek 747 836E 43 11 433N Clifton 43998, †Dry Canyon 733 135E 43 61 525N Clifton 48898, †Coyote Canyon 738 464E 43 67 126N Clifton 48931, Marble Canyon 744 038E 43 70 885N Clifton 51306.

***Gilia sinuata*** Benth. (Plates 587a, b, c, d, e)

SINUATE GILIA. Infrequent, below 7000 ft.; sandy places. May-Jun. \*Spring Valley T13N R67E S10

***Gilia tenerrima*** A. Gray (Plate 588)

DELICATE GILIA. Frequent, below 9,800 ft.; openings in sagebrush, open forest floors. Jun-Aug. Baker Creek 38° 59' 09.7 114° 14' 59.2", !Lehman Creek 736 507E 43 21 711N, !Burnt Mill Canyon 737 094E 43 23 386N, †Between Jeff Davis Peak and Baker Creek 736 720E 43 19 257N (NAD 83) Clifton 49038. [*Lathrocasis t.* (A. Gray) L. A. Johns.

***Gilia triodon*** Eastw. (Plate 589)

COYOTE GILIA. Fairly frequent, below 6500 ft.; open sandy places. May-Jun. \*Highway 894 726 265E 43 04 952N Clifton

43939, †Black Horse Canyon 734 230E 43 33 960N Clifton 48980. [*Aliciella t.* (Eastw.) Brand

## IPOMOPSIS

(Gilia)

- 1 Plants annual; style short
  - 2 Filaments of the stamens not any longer than the anthers; leaves all toothed. . . . . *I. polycladon*
  - 2 Filaments of the stamens quite a bit longer than the anthers; leaves mostly entire and sharp-pointed. . . . . *I. depressa*
- 1 Plants biennial or perennial; style elongated
  - 3 Flowers bright red to pinkish and in an open inflorescence
    - 4 Flowers fairly to bright red; tub over 4 mm wide at the apex. . . . . *I. aggregata*
    - 4 Flowers pale pink; tub about 3 mm wide at apex. . . . . *I. tenuituba*
  - 3 Flowers white, sometimes with a yellow throat and in capitate heads. . . . . *I. congesta*

### *Ipomopsis aggregata* (Pursh.) V. Grant

var. *aggregata* (Plates 590a, b)

SCARLET GILIA, SKY ROCKET. Fairly frequent, below 10300 ft.; openings in sagebrush, rocky slopes. This taxon is extremely variable with many forms. These forms most likely can not be named because they seem to appear almost any where throughout the range of the species. May-Sep. !Mill Creek T13N R69E S6 North Fork Baker Creek 34 626E 17 448N, \*Snake Creek 6360 ft. Fred Landau 34, Snake Creek 744 300E 43 10 700N Clifton 41036, \*Baker Creek 738 950E 43 18 490N Clifton 48804.

### *Ipomopsis congesta* (Hook.) V. Grant

- a Flowers with yellow tube and throat; anthers blue. . . . . var. ‘pulchella’
- a Flowers not combing the above
  - b Leaves divided
    - c Plants not real compact; leaf 5-7-lobed. . . . . var. *palmifrons*
    - c Plants quite compact; leaf 3-lobed. . . . . var. *montana*
  - b Leaves entire. . . . . var. *crebrifolia*

var. *crebrifolia* (Nutt.) A. Gray (Plates 591a, b)

SIMPLE-LEAVED BALL-HEADED IPOMOPSIS. Infrequent, 6400-10300 ft.; limestone outcrops, gravelly slopes. May-early Jul. \*South Fork Big Wash T12N R69E S26, †between Murphy Wash and Johns Wash 732 287E 42 87 868N Clifton 43961, Granite Peak 737 370E 43 03 318N Clifton 45237.

var. *montana* (Nels. & Kenn.) Const. & Roll. (Plates 592a, b)

ALPINE BALL-HEADED IPOMOPSIS. Infrequent, above 10500 ft.; open alpine ridge tops. This and the next taxon pass into one another. Jul-Aug. \*Mount Washington T12N R68E S11, Big Wash Peak 738 529E 43 06 899N Clifton 45258

var. *palmifrons* (A. Brand.) G. Clifton (Plates 593a, b)

PALMATELY-LEAVED BALL-HEADED IPOMOPSIS. Infrequent, below 10700 ft.; open gravelly places, scree slopes. The plants on the upper reaches of Pole Canyon are compact, have the basal leaves 3-lobed and the upper 5-lobed and others have the leaves all 5-7-lobed. May-Sep. \*Grub Gulch T14N R68E S5, !Grub Gulch T14N R68E S7, Pole Canyon 740 199E 43 14 353N, Big Canyon 741 928E 43 51 790 (NAD 83) Clifton 47154. [*Gilia c.* Hook. var. *p.* Brand, *I. c.* (Hook.) V. Grant ssp. *P.* (Brand) Day].

var. ‘pulchella’ (Plates 594a, b)

BEAUTIFUL BALL-HEADED IPOMOPSIS. Rare, about 9020 ft.; limestone chip rock on open ridge tops. Mid Jun-mid Jul. Ptomaine Springs Ridge 733 775E 43 67 618N

### *Ipomopsis depressa* (M.E. Jones ex A. Gray) V. Grant (Plates 595a, b, c)

SHORT IPOMOPSIS. Infrequent, below 5700 ft.; sandy valley floors. This taxon was transferred to *Loeseliastrum* based on the fact that the flowers are zygomorphic which is not true. It is a disconcerting feature in *Gilia*, *Ipomopsis* and *Loeseliastrum*. May-Jun. \*Hamlin Valley T10N R70E S13, †Snake Creek 753 533 43 12 382. [*Gilia d.* M. E. Jones ex A. Gray, *Loeseliastrum d.* M. E. Jones ex A. Gray) J. M. Porter & L. A. Johns.].

### *Ipomopsis tenuituba* (Rydb.) V. Grant

var. *tenuituba* (Plate 596)

SLIM-TUBBED SKYROCKET. Infrequent, mostly above 8200 ft.; rocky slopes that are open to lightly wooded. *I. macrosiphon* is apparently limited to Arizona and New Mexico. Late Jun-Jul. Decathon Canyon 736 405E 43 01 820N Clifton 45252, Chalk Spring 738 254E 43 57 820N, Head of Water Canyon 736 658E 43 55 559N (NAD 83) Clifton 47183.

### *Ipomopsis polycladon* (Torr.) V. Grant (Plates 597a, b)

SPREADING IPOMOPSIS. Infrequent, below 6500 ft. dry sandy or gravelly flats. May-Jun. \*Hamlin Valley T10N R70W S13.

### LEPTODACTYLON

**Note:** This doesn't belong in *Linanthus* because it opens at night. With that in mind, than the annual plants that open at night should also be in this genus, these include *Linanthus bigelovii*, *L. dichotomous*, and *L. jonesii*, which grow to the sough.

- 1 Plants forming dense mats on the ground. . . . . *L. caespitosum*  
 1 Plants essentially erect, not forming mats. . . . . *L. pungens*

*Leptodactylon caespitosum* Nutt. (Plates 598a, b)

MATTED PRICKLY-PHLOX. Limited, about 6480 ft.; barren calcareous tuft. May-Jul. †Red Ledges 736 832E 42 84 395 Clifton 43975.

*Leptodactylon pungens* (Torr.) Rydb. (Plates 599a, b)

GRANITE PRICKLY-PHLOX. Fairly frequent, below 11000 ft.; openings in sagebrush, sandy to rocky places. May-Aug. !Baker Creek T13N R69E S14, \*Weaver Creek 6430 ft. Raymond Jandl., †Highway 745 247E 43 27 439N Clifton 44004, \*Dry Canyon 733 135E 43 61 525N Clifton 48896.

### MICROSTERIS

*Microsteris gracilis* (Hook.) Greene

var. *humilior* (Hook.) Cronq. (Plate 600)

FALSE PHLOX. Frequent, below 10100 ft.; dry, open places. Apr-Jun. \*Snake Creek T12N R69E S8, !Buck Mountain T13N R68E S1.

### PHLOX

- 1 Plants open, the internodes apparent. . . . . *P. longifolia* complex  
 1 Plants compact, internodes obscure  
 2 Plants in vernal moist saline meadows. . . . . *P. kelseyi*  
 2 Plants of dry places  
 3 Intercostal membrane very prominent, with no hairs covering it, when dry it has a center fold. . . . . *P. austromontana*  
 3 Intercostal membrane not prominent, either partly cover to completely covered by hairs, lacking a center fold  
 4 The membrane of calyx covered with long woolly hair. . . . . *P. hoodii*  
 4 The membrane lacking long woolly hair  
 5 The leaves curved outward looking like hooks. . . . . *P. griseola*  
 5 The leaves hardly curved  
 6 Calyx most often bearing glandular hairs  
 7 Inner surface of corolla tube bearing a small band of hairs just up from the base; forming mats. . . . . *P. pulvinata*  
 7 Inner surface of corolla tube lacking a small band of hairs; plants forming mounds. . . . . *P. condensata*  
 6 Calyx bearing all eglandular hairs. . . . . *P. muscoides*

*Phlox austromontana* Cov. (Plates 601a, b, c)

DESERT or WESTERN MOUNTAIN PHLOX. Frequent, 6000-9000 ft.; dry open stony or gravelly slopes, washes. May-Jul. \*Big Wash T12N R70E S27, †between Johns Wash & Big Springs Wash 739 547E 42 87 890N Clifton 43970, †Cedar Cabin Spring 741273E 4297807N Clifton 49049.

*Phlox griseola* Wherry

GRAY-LEAVED PHLOX. In frequent, below 7000 ft.; rocky slopes, barrens on valley floors. The type locality is Spring Valley. May. †Red Ledges 736 389E 42 83 270 Clifton 43978.

*Phlox hoodii* Richards.

var. *canescens* (T. & G.) Peck

CARPET PHLOX. Frequent, below 8000 ft.; open gravelly slopes and flats. May-Jun. \*Murphy Wash T10N R68E S9,

*Phlox kelseyi* Britt.

SALT MARSH PHLOX. Limited, 5660-5760 ft.; moist subalkaline meadow. May. \*†Highway 50 722 741E 43 35 232N Clifton 44012, †Spring Valley 722585E 4301215N Clifton 45648. [ssp. *salina* (M. E. Jones) Wherry].

*Phlox longifolia* complex (Plate 602)

VARIABLE PHLOX. Frequent, below 8500 ft.; open, often rocky places. There is no way to separate this group of plants into different taxa. There are numerous plants that at first appearance seem to represent distinct taxa, but there are way too many that link these together. Mid April-Jun. \*between Big Wash and Snake Creek T12N R70E S12, !Burnt Mill Canyon T13N R69N S6, Chalk Spring 738 254E 43 57 820N. [*P. longifolia* Nutt. var. *stansburyi* (Torr.) A. Gray].

***Phlox tumulosa*** Wherry (Plates 603a, b)

INTERMOUNTAIN MOSS PHLOX. Fairly infrequent, 5600-8000 ft.; barren gravelly slopes. Some workers are making this a variety of *P. hoodii*, but this author sees no reason to do so. This whole genus will be played with for years to come, moving plants from one species to another. May-Jun. \*Johns Wash T10N R69E S30, †Johns Wash 663 628E 42 87 890N Clifton 43969.

***Phlox pulvinata*** (Wherry) Cronq. (Plates 604a, b)

CUSHION PHLOX. Frequent, above 7000 ft.; open rocky slopes. May-Aug. \*above Johnson Lake T13N R68E S36, †Highland Ridge 734 750E 32 06 771N, !Wheeler Peak 731 696E 43 19 755N. [*P. caespitosa* Nutt. ssp. *p.* Wherry].

## POLEMONIUM

- 1 Leaflets simple, smells only slightly mephitic. . . . . ***P. pulcherrimum***  
 1 Leaflets deeply cut, smells very strongly mephitic. . . . . ***P. viscosum***

***Polemonium pulcherrimum*** Hook.

var. *delicatum* (Rydb.) Cronq. (Plates 605a, b)

SHOWY POLEMONIUM, SHORT JACOB'S LADDER. Fairly frequent, 9000-11000 ft.; cliff crevices, rocky slopes. Jun-Aug.

\*Johnson Lake T13N R68E S36, !Stella Lake T13N R69E S11.

***Polemonium viscosum*** Nutt. (Plates 606a, b)

SKY PILOT. Fairly frequent, above 9000 ft.; cliff crevices, rocky slopes Jun-Aug. \*above Stella Lake T13N R68E S11, !Wheeler Peak 731 696E 43 19 755N, The Table 742 249E 43 51 786 (NAD 83) Clifton 47163.

## POLYGALACEAE Milkwort Family

### POLYGALA Milkwort

- 1 Plants woody well above ground; flowers 3-5 mm long not showy. . . . . ***P. acanthoclada***  
 1 Plants hardly woody above ground; flowers 8-12 mm long showy. . . . . ***P. subspinosa***

***Polygala acanthoclada*** A. Gray

var. *intricata* Eastw. (Plates 607a, b)

INTERMOUNTAIN THORNY MILKWORT. Limited, sagebrush slopes. \*†Hamlin Valley 749 846E 42 91 000N Clifton 45158.

***Polygala subspinosa*** S. Wats. (Plates 608a, b)

SPINY MILKWORT. Infrequent, below 8500 ft.; rocky slopes in desert scrub, pinyon-juniper woodland. May-early Jul. Lehman Ridge Raymond Jandl, †Snake Creek 748 635E 43 11 600N Clifton 43995, Dry Canyon 733 700E 43 61 500N Clifton 48901.

Plates 442a-444b



Plate 442a *Astragalus agrestis*



Plate 442b



Plate 443a *Astragalus argophyllus*



Plate 443b



Plate 443c



Plate 444a *Astragalus australis* var. *glabriusculus*



Plate 444b

Plates 444c-447b



Plate 444c



Plate 445a *Astragalus beekwithii* var. *purpureus*



Plate 445a



Plate 445c



Plate 446b



Plate 447b



Plate 446a *Astragalus calycosa*



Plate 447a *Astragalus calycosa* var. 'albiflorus'

Plate 448a-451c



Plate 448a *Astragalus canadensis*



Plate 448b



Plate 449a *Astragalus chamaemeniscus*



Plate 449b



Plate 450a *Astragalus convallarius*



Plate 450b



Plate 450c



Plate 451a *Astragalus diversifolius*



Plate 451b



Plate 451c

Plates 452a-455a



Plate 452a *Astragalus geyeri*



Plate 452b



Plate 453a *Astragalus humistratus* var. *humivagans*



Plate 453b



Plate 453c



Plate 454 *Astragalus kentrophyta* var. *elatus*



Plate 455a *Astragalus kentrophyta* var. *tegetarius*

Plates 455b-458b



Plate 455b



Plate 456a *Astragalus lentiginosus* var. *diphyus*



Plate 456b



Plate 456c



Plate 457a *Astragalus lentiginosus* var. *latus*



Plate 457b



Plate 457c



Plate 458a *Astragalus lentiginosus* var. *salinus*



Plate 458b

Plates 458c-461b



Plate 458c



Plate 459a *Astragalus lonchocarpus*



Plate 459b



Plate 459c



Plate 460b



Plate 460a *Astragalus miser* var. *oblongifolius*



Plate 460c



Plate 461b



Plate 461a *Astragalus newberryi* var. *castoreus*

Plates 461c-465a



Plate 461c



Plate 462b



Plate 462c



Plate 462a *Astragalus piutensis*



Plate 463 *Astragalus platytropis*



Plate 464a *Astragalus tenellus*



Plate 465a *Astragalus toanus*



Plate 464b

Plates 465b-468a



Plate 465b



Plate 465c



Plate 466b



Plate 466a *Astragalus utahensis*



Plate 466c



Plate 467b



Plate 467a *Astragalus whitneyi*



Plate 468a *Dalea searlsiae*

Plate 467b-470c



Plate 467b



Plate 468a *Glycyrrhiza lepidota*



Plate 468b



Plate 468c



Plate 469a *Hedysarum boreale*



Plate 469b



Plate 470a *Lupinus argenteus*  
complex



Plate 470b



Plate 469c



Plate 470c

Plates 472-479a



Plate 472 *Medicago lupulina*



Plate 473 *Medicago sativa*



Plate 474 *Melilotus albus*



Plate 475 *Melilotus officinalis*



Plate 476a *Onobrychis viciifolia*



Plate 476b



Plate 477b



Plate 478b



Plate 477a *Oxytropis deflexa* var. *foliolosa*



Plate 477c



Plate 478a *Oxytropis parryi*



Plate 478c



Plate 479a *Thermopsis rhombifolia* var. *montana*

Plates 479b-483



Plate 479b



Plate 480a *Trifolium andinum*



Plate 480b



Plate 481a *Trifolium eriocephalum* var. *villiferum*



Plate 481b



Plate 482a *Trifolium fragiferum*



Plate 482b



Plate 483 *Trifolium gymnocarpon*

Plates 484a-488a



Plate 484a *Trifolium longipes* var. *hansenii*



Plate 484b



Plate 484c



Plate 485 *Trifolium pratense*



Plate 486a *Trifolium repens*



Plate 486b



Plate 487a *Vicia americana*



Plate 487b



Plate 487c



Plate 488a *Corydalis aurea*

Plates 488b-491b



Plate 488b



Plate 488c



Plate 489b



Plate 489c



Plate 489a *Centaurium exaltum*



Plate 490a *Frasera albomargi-*



Plate 490b



Plate 491a *Frasera gypsicola*



Plate 491b

Plates 492-496b



Plate 492 *Frasiera speciosa*



Plate 493 *Gentiana affinis*



Plate 494 *Erodium cicutarium*



Plate 495 *Geranium richardsonii*



Plate 496a *Ribes aureum*



Plate 496b

Plates 497a-502



Plate 497a *Ribes cereum*



Plate 497c



Plate 498b



Plate 497b



Plate 498a *Ribes inerme*



Plate 499 *Ribes montigenum*



Plate 500 *Ribes velutinum*



Plate 501 *Aquilegia coerulea*



Plate 502 *Aconitum columbianum*

Plates 503-509a



Plate 503 *Aquilegia cross*



Plate 504 *Aquilegia formosa*



Plate 506b



Plate 505 *Aquilegia scopulorum*



Plate 506a *Delphinium andersonii*



Plate 507b



Plate 507a *Hippuris vulgaris*



Plate 508a *Eucrypta micrantha*



Plate 508b



Plate 509a *Hesperochiron pumilus*

Plates 509b-513b



Plate 509b



Plate 510 *Nama demissum*



Plate 511a *Phacelia affinis*



Plate 511b



Plate 512a *Phacelia crenulata*



Plate 512b



Plate 513a *Phacelia hastate* var. *alpina*



Plate 513b



Plate 512c

Plates 514a-518b



Plate 514a *Phacelia hastata*



Plate 514b



Plate 515a *Phacelia incana*



Plate 516a *Phacelia ivesiana*



Plate 516b



Plate 515b



Plate 518b



Plate 517 *Phacelia saxicola*



Plate 518a *Phacelia sericea* var. *ciliosa*

Plates 519-525a



Plate 519 *Hypericum scouleri*



Plate 520 *Dracocephalum parviflorum*



Plate 521a *Hedeoma drummondii*



Plate 521b



Plate 522b



Plate 522a *Lycopodium asper*



Plate 523 *Marrubium vulgare*



Plate 524a *Mentha canacensis*



Plate 525a *Monardella odoratissima*



Plate 524b

Plates 525b-531



Plate 525b



Plate 526 *Salvia dorrii*



Plate 527a *Linum kingii*



Plate 528 *Utricularia*



Plate 527b



Plate 529a *Linum lewisii*



Plate 529b



Plate 530a *Mentzelia albicaulis*



Plate 530b



Plate 531 *Mentzelia dispersa*

Plates 532a-536b



Plate 532a *Mentzelia laevicaulis*



Plate 532b



Plate 533a *Melva neglecta*



Plate 533b



Plate 534a *Sidalcea candida*



Plate 534b



Plate 535a *Sidalcea neomexicana* var. *crenulata*



Plate 536b



Plate 535b



Plate 536a *Sphaeralcea grossularifo-*

Plates 537a-540b



Plate 537a *Centunculus minimus*



Plate 537b



Plate 537c



Plate 538 *Glaux maritima*



Plate 539a *Abronia elliptica*



Plate 539b



Plate 540a *Abronia nana*



Plate 539c



Plate 540b

Plates 541-545b



Plate 541 *Mirabilis alipes*



Plate 542b



Plate 542c



Plate 542a *Mirabilis linearis*



Plate 544b



Plate 543 *Mirabilis multiflora*



Plate 544a *Calylophus lavandulifolius*



Plate 545a *Camissonia boothii* var. 'striglosa



Plate 545b

Plates 545c-549b



Plate 545c



Plate 546a *Camissonia claviformis* var *purpurascens*



Plate 546b



Plate 547b



Plate 548b



Plate 547a *Camissonia minor*



Plate 549a *Camissonia pterosperma*



Plate 549b



Plate 548a *Camissonia pusilla*

Plate 550a-554c



Plate 550a *Camissonia scapoidea*



Plate 550b



Plate 550c



Plate 551a *Camissonia* 'pseudomultijuga'



Plate 551b



Plate 553b



Plate 552 *Chamerion angustifolium*



Plate 553a *Epilobium brachycarpum*



Plate 554a *Epilobium ciliatum*



Plate 554b



Plate 554c

Plates 555-561



Plate 555 *Epilobium hornemannii*



Plate 556 *Gayophytum decipiens*



Plate 557b



Plate 557a *Gayophytum diffusum* var. *strictipes*



Plate 557c



Plate 558 *Gayophytum ramosissimum*



Plate 559 *Gayophytum racemosum*



Plate 560 *Oenothera caespitosa* var. *crinita*



Plate 561 *Oenothera caespitosa* var. *marginata*

Plates 562a-566b



Plate 562a, b *Oenothera elata* var. *hirsutissima*



Plate 563 *Oenothera flava*



Plate 564 *Oenothera howardii*



Plate 565a *Oenothera pal-*



Plate 565b



Plate 566a *Orobanche corymbosa*



Plate 566b

Plates 567a-573b



Plate 567a *Orobanche fasciculata*



Plate 567b



Plate 567c



Plate 568 *Orobanche ludoviciana*



Plate 569 *Orobanche uniflora*



Plate 572b



Plate 570 *Argemone munita* var. *rotundata*



Plate 571 *Parnassia parviflora*



Plate 573b



Plate 572a *Jamesia tetrapetala*



Plate 573a *Philadelphus microphyllus*

Plates 574a-579a



Plate 574a *Plantago lanceolata*



Plate 574b



Plate 575b



Plate 575a *Plantago major*



Plate 576 *Collomia linearis*



Plate 577 *Collomia tenella*



Plate 578 *Eriastrum signatum*



Plate 579a *Eriastrum wilcoxii*

Plates 579b-583a



Plate 579b



Plate 580a *Gilia brecciarum*



Plate 580b



Plate 581a *Gilia hutchinsifolia*



Plate 581b



Plate 581c



Plate 582a *Gilia inconspicua*



Plate 582b



Plate 583a *Gilia leptomeria*

Plates 583b-587c



Plate 583b



Plate 583c



Plate 584a *Gilia micromeria*



Plate 584b



Plate 585a *Gilia* 'canarina'



Plate 585b



Plate 586a *Gilia ophthalmoides*



Plate 587a *Gilia sinuata*



Plate 587b



Plate 586b



Plate 587c

Plates 587d-593a



Plate 587d



Plate 587e



Plate 588 *Gilia tenerrima*



Plate 589 *Gilia triodon*



Plate 590a *Ipomopsis aggregata*



Plate 591a *Ipomopsis congesta*  
var. *crebrifolia*



Plate 590b



Plate 591b



Plate 592a *Ipomopsis congesta* var. *montana*



Plate 592b



Plate 593a *Ipomopsis congesta*  
var. *palmifrons*

Plates 593b-597b



Plate 593b



Plate 594a *Ipomopsis congesta* var. 'puchella'



Plate 594b



Plate 595b



Plate 595a *Ipomopsis depressa*



Plate 596 *Ipomopsis tenuituba*



Plate 595c



Plate 597b



Plate 597a *Ipomopsis polycladon*

Plates 598a-601b



Plate 598a *Leptodactylon caespitosum*



Plate 598b



Plate 599a *Leptodactylon pungens*



Plate 599b



Plate 600 *Microsteris gracilis* var. *humilior*



Plate 601a *Phlox austromontana*



Plate 601b

Plates 601c-605b



Plate 601c



Plate 602 *Phlox longifolia* complex



Plate 603a *Phlox tumulosa*



Plate 603b



Plate 604a *Phlox pulvinata*



Plate 604b



Plate 605a *Polemonium pulcherrimum* var. *delicatum*



Plate 605b

Plates 606a-607b



Plate 606a *Polemonium viscosum*



Plate 606b



Plate 607a *Polygala acanthoclada* var. *intricata*



Plate 607b

Plates 608a-609



Plate 608a *Polygala subspinosa*



Plate 608b



Plate 609 *Mirabilis* 'acutifolia'

**POLYGONACEAE** Buckwheat Family

- 1 Leaves without stipules
  - 2 Flowers subtended by a whorl of connate bracts . . . . . *Eriogonum*
  - 2 Flowers subtended by (3-) 4 (-7) obscure bracts that are not connate. . . . . *Johnshowellia*
- 1 Leaves with evident stipular sheaths; flowers lacking an involucre
  - 3 The outer perianth segments spreading or reflexed, staying small, the inner usually erect and enlarging in fruit, not petal-like
    - 4 Leaves lanceolate to ovate; plants growing on slopes and flats, often wet. . . . . *Rumex*
    - 4 Leaves rounded-reniform; plants growing on steep rocky slopes and cliffs. . . . . *Oxyria*
  - 3 The outer and inner perianth segments about the same, petal-like
    - 5 Inflorescence not branched. . . . . *Bistorta*
    - 5 Inflorescence branched
      - 6 Flowers subtended by bracts; filaments of the stamens wider at the base than at the top. . . . . *Polygonum*
      - 6 Flowers not subtended by bracts; filaments of the stamens as wide at the bottom as at the top. . . . . *Persicaria*

**BISTORTA**

(Polygonum)

- 1 Inflorescence a spike; all, or at least the lower flowers replaced by pinkish to purple bulblets. . . . . *B. vivipara*
- 1 Inflorescence capitate; not forming bulblets. . . . . *B. bistortoides*

***Bistorta bistortoides*** (Pursh) Small (Plate 635)

WESTERN BISTORT or SNAKEWEED. Widely scattered, 7000-10000 ft.; moist meadow. May-Aug. \*Johnson Lake T13N R68E S36, !Lehman Creek T13N R69E S8, !Wheeler Peak Campground T13N R68E S11. [*Polygonum b.* Pursh].

***Bistorta vivipara*** (L.) S. F. Gray

ALPINE BISTORT Limited, 9500-10000 ft.; alpine meadows and along streamlets. Reported from somewhere in the area of this treatment. Jun-Sep. [*Polygonum v.* L.]

**ERIOGONUM** Buckwheat

- 1 Plants annual
  - 2 Plants with the perianth yellow and hairy, branches glandular-hairy. . . . . *E. howellianum*
  - 2 Plants not with the above combination
    - 3 Stems leafy; leaves sericeous and green on both surfaces. . . . . *E. darrovii*
    - 3 Stems lacking leaves; leaves tomentose at least on the lower surface
      - 4 Involucres appressed to the stem. . . . . *E. palmerianum*
      - 4 Involucres divergent from the stem
        - 5 Outer perianth segments cordate, margins not wavy
          - 6 Involucre broadly campanulate to hemispheric; perianth yellow to reddish-yellow. . . . . *E. hookeri*
          - 6 Involucre longer than broad, turbinate; perianth essentially white. . . . . *E. deflexum*
        - 5 Outer perianth segments truncate; margins wavy. . . . . *E. cernuum*
- 1 Plants perennial
  - 7 Perianth pubescent on the outer surface
    - 8 Flowers stipe-like at the base. . . . . *E. caespitosum*
    - 8 Flowers not or indistinctly forming a stipe-like base
      - 9 Plants loosely caespitose, branches prostrate to weakly erect, 2-8 cm long, achenes glabrous. . . . . *E. villiflorum*
      - 9 Plants densely caespitose, branches erect, about 3 cm long; achenes pubescent. . . . . *E. shockleyi*
  - 7 Perianth glabrous without
    - 10 Flowers stipe-like at the base. . . . . *E. umbellatum*
    - 10 Flowers not or indistinctly forming a stipe-like base
      - 11 Inflorescence a capitate head on a single scape
        - 12 Leaves, stems and sometime the perianth bearing some glandular hairs
          - 13 Lobes of the involucre fairly broadly scarious margined; flowers pseudo-dioecious. . . . . *E. holmgrenii*
          - 13 Lobes of the involucre hardly scarious on the margins; flowers perfect. . . . . *E. 'arches'*
        - 12 Leaves, stems and perianth lacking glandular hairs. . . . . *E. ovalifolium*

- 14 Stems glabrous. . . . . *E. 'alluvium'*  
 14 Stems hairy, if woody, than hairy on the new season growth  
 15 Involucre appressed to the rachis  
 16 Involucres with most of them fairly close together so that the flowers overlap; perianth  $\pm 4$  mm long;  
 inflorescence few branched. . . . . *E. racemosum*  
 16 Involucres with most of them widely spaced so that the flowers don't overlap; perianth  $\pm 3$  mm long;  
 inflorescence much branched . . . . . *E. 'innovatum'*  
 15 Involucres spreading or on short branchlets  
 17 Perianth segments not cordate; the broader leaves oval, at least 10 mm wide. . . . . *E. 'arenosum'*  
 17 Perianth cordate; the broader leaves elliptic, less than 10 mm wide. . . . . *E. microthecum*

***Eriogonum 'alluvium'*** (Plates 636a, b, c)

ALLUVIUM WILD BUCKWHEAT. Limited, 6100-6200 ft.; rocky limestone alluvium. The plants didn't flower in 2006 because of lack of rain. These plants are similar to *E. eremicum* but different in that the leaves have green showing through on the upper surface and the involucre are single per flowering branch. Jul-Aug. †Big Springs Wash 744 664E 42 82 780N Clifton 45689.

***Eriogonum 'arenosum'*** (Plates 637a, b, c)

SAND WILD BUCKWHEAT. Rare, below 6000 ft.; sandy places. These plants have been called *Eriogonum nummulare*, however they don't look like that taxon. They also essentially die back to the ground each year. \*Marble Wash 241 953E 43 66 510N Clifton 48965.

***Eriogonum 'arches'***

ARCHES WILD BUCKWHEAT. Limited, about 8160 ft.; limestone benches on canyon walls. These plants are mat forming and are quite similar to *E. holmgrenii*. They differ in that they are perfect flowered, the perianth segments start out whitish turning reddish, they have no dark mid-nerve, and as the flower matures the perianth tube enlarges enclosing the fruit. Jun-Jul. †Lexington Arch 742 587E 43 02 965N.

***Eriogonum caespitosum*** Nutt. (Plates 638a, b)

CESPITOSE WILD BUCKWHEAT. Fairly frequent, below 9000 ft.; dry slopes, canyons, openings in sagebrush. May-July. \*Osceola Road T14N R68E S5.

***Eriogonum cernuum*** Nutt.

- a Peduncles 0-2 mm long. . . . . var. *viminale*  
 a Peduncles 2-25 mm long. . . . . var. *cernuum*

var. *cernuum* (Plates 639a, b)

NODDING WILD BUCKWHEAT. Fairly frequent, below 8000 ft.; sandy places. Jun-Sep. †Snake Creek 743 330 43 11 325 Clifton 43027, †Want Spring 734 413E 43 34 178N Clifton 48987.

var. *viminale* S. Stokes

SHORT STALKED NODDING WILD BUCKWHEAT. below 8000 ft. This taxon should be somewhere on the valley floors as this treatment is well within its range. Late Jul-Sep.

***Eriogonum darrovii*** Kearney (Plate 640)

DARROW'S WILD BUCKWHEAT. Rare, about 5600 ft.; limestone scabland. Jul-Sep. \*Snake Creek 753 034E 43 12 370N Clifton 42883.

***Eriogonum deflexum*** Torr.

var. *nevadense* Rev. (Plates 641a, b, c)

DEFLEXED WILD BUCKWHEAT. Frequent, below 5800 ft.; sandy valley floors. The achene is glabrous to scabrous on the angles. The flowers seem to have some of them with well developed anthers while others seem to be lacking well developed anthers. May-(Oct.). \*Spring Valley T13N R67E S33, †The Cedars 723 823E 43 12 680N Clifton 44985.

***Eriogonum holmgrenii*** Rev. (Plates 642a, b)

HOLMGREN'S WILD BUCKWHEAT. Locally frequent, 9500-12000 ft.; open rocky places; type is from the west base of Pyramid Peak. This taxon is functionally dioecious. The flowers that are very white with exerted stamens are functionally staminate, flowers that have a lot of pink are functionally pistillate. Jul-Sep. \*above Williams Canyon T13N R68E S35, †Highland Ridge 734 750E 43 06 771N.

***Eriogonum hookeri*** S. Wats. (Plates 643a, b, c)

HOOKER'S WILD BUCKWHEAT. Infrequent, below 7000 ft.; openings in pinyon-juniper woodland. Jul-Oct. Pole Canyon, †Murphy Wash 731 786E 42 90 365N Clifton 44980, \*Marble Wash 745 573E 43 69 727N Clifton 48953.

***Eriogonum howellianum*** Reveal (Plates 644a, b)

HOWELL'S WILD BUCKWHEAT. Infrequent, below 6200 ft.; limestone scabland. Late Jun-Jul. †Snake Creek 753 065E 43

12 587N, †South Highland Road 724 809E 42 96 448N Clifton 44975.

***Eriogonum* 'innovatum'** (Plates 645a, b)

VARIATION WILD BUCKWHEAT. Rare, about 5935 ft.; rocky slopes in sagebrush, old rocky road. These plants are a strange form of *E. racemosum*. Aug. Lehman Creek 745 080E 43 22 160N Clifton 52155.

***Eriogonum microthecum*** Nutt.

- a Plants dwarfs, not woody at the base. . . . . var. *lapidicola*
- a Plants quite tall, woody at the base
  - b The leaves quit revolute, up 3 mm wide. . . . . var. *simpsonii*
  - b Leaves with the larger not real revolute, over 3 mm wide. . . . . var. *laxiflorum*

var. *lapidicola* Reveal (Plates 646a, b)

DWARF WILD BUCKWHEAT. Infrequent, below 7200 ft.; limestone gravels. This name includes all dwarf forms of the *microthecum* complex. They have various shaped leaves and types of inflorescence. Sometimes these all grow in the same spot, while at other spots there is only one kind. Jul-Aug. †Snake Creek 753 820E 43 12 478N, †Murphy Wash 731 547E 42 90 390N Clifton 44979, Devils Gate Canyon 744 556E 43 73 467N Clifton 48949.

var. *laxiflorum* Hook. (Plates 647a, b)

LAX-FLOWERED BASIN WILD BUCKWHEAT. Frequent, below 10000 ft.; open to fairly brushy slopes. Jul-Oct. \*Gray Cliffs T13N R9E S22, †Horse Heaven 744 440E 43 14 253N Clifton 45307.

var. *simpsonii* (Benth.) Reveal (Plates 648a, b, c)

SIMPSON'S WILD BUCKWHEAT. Frequent, below 10000 ft.; open or fairly brushy rocky slopes. In the Snake Range these plants are quite variable as to the inflorescence and leaf shapes. There are some with leaves up to the flower stalks Jul-Oct. \*Gray Cliff T13N R69E S22, †Horse Heaven 744 440E 43 14 253N Clifton 45307.

***Eriogonum ovalifolium*** Nutt. "complex" (Plates 649a, b)

This is a very polymorphic group of plants with a number of named varieties, however the characters used to separate them are often found on the same plant. There are trends from one place to another, but the plants are so diverse that there is no way to separate all of them into any kind of meaningful taxa. On a road in Idaho there was three forms of the yellow-flowered part of the complex that could be named.

CUSHION WILD BUCKWHEAT. Infrequent, below 11,800 ft.; ridge tops, slopes and flats. The plants that were 2 ridges south of Johnson Lake are what have been called var. *nivale* (Canby ex Cov.) M. E. Jones. May-Aug. \*†2 ridges south of Johnson Lake 734 153E 43 12 031N Clifton 45273, \*Murphy Wash T10N R68E S15, !Lehman Caves 38 59 56 114 12 34 Clifton 11180, South Fork Marble Wash 737 330E 43 63 626N Clifton 48922. [var. *nivale* (Canby ex Cov.) M. E. Jones, var. *purpureum* (Nutt.) Durand.].

***Eriogonum palmerianum*** Rev. (Plates 650a, b)

PALMER'S WILD BUCKWHEAT. Fairly frequent, below 8,000 ft.; valley floors, sandy washes, rocky slopes. Jun-(Oct.). \*The Cedars T13N R67E S34, \*Cave Canyon 747 923E 43 12 419N, †Want Spring 734 413E 43 34 178N Clifton 48983.

***Eriogonum racemosum*** Nutt. (Plate 651)

RACEMOSE WILD BUCKWHEAT. Frequent, below 8,800 ft.; gravelly slopes among sagebrush. Jun-Oct. \*Snake Creek T12N R69E S9, Wheeler Peak Road T13N R69E S6, !Lehman Creek T13N R69E S10 Clifton 11728, †Horse Heaven 744 628E 43 14 328N Clifton 45296.

***Eriogonum shockleyi*** S. Wats. (Plates 652a, b)

SHOCKLEY'S WILD BUCKWHEAT. Fairly frequent, below 6,000 ft.; open barren places in shallow soil. There are whitish and yellow flowered plants in this taxon. May-Sep. \*Spring Valley T13N R67E S33, \*Red Ledges T9½N R69E S31, Weaver Creek T14N R69E S15.

***Eriogonum umbellatum*** Torr.

**Note:** This is a huge complex with at least 40 named varieties. There are many more combinations that could be named.

- a Inflorescence simple umbellate, lacking a whorl of bracts below each umbel
  - b Perianth cream to light yellow; lower surface of leaves hairy. . . . . var. *dichrocephalum*
  - b Perianth yellow; lower surface ± glabrous by flowering. . . . . var. *aureum*
- a Inflorescence with at least some of them compound or at least some of them with a whorl of bracts below the umbels
  - c Flowers cream-colored. . . . . var. *juniporinum*
  - c Flowers yellow. . . . . var. *subaridum*

var. *aureum* (Gandog.) Rev. (Plates 653a, b)

GOLDEN SULPHUR FLOWERED. Infrequent, 9000-11000 ft.; rocky slopes, from open forest floors to alpine. Jul-Aug. Bald Mountain 39° 01' 03" 114° 18' 32" Clifton 28620.

var. *dichrocephalum* Gand. (Plates 654a, b)

BICOLOR SULPHUR FLOWER. Fairly frequent, above the valley floor to 11,000 ft.; gravelly slopes. The plants on Highland Ridge are a little more yellow than they should be, but the leaves are right. Jun-Sep. \*†Snake Creek 748 030E 43 12 245N Clifton 42892, †Highland Ridge 734 368E 43 05 834N Clifton 45279, †Deerhead Canyon 739 240E 43 52 845N (NAD 83) Clifton 47140, Head of Water Canyon 736 658E 43 55 559N (NAD 83) Clifton 47181.

var. *juniporinum* Rev. (Plate 655)

JUNIPER SULPHUR FLOWER. Fairly frequent, below 10000 ft.; brushy slopes in gravelly soil. The type came from Sacramento Pass. The plants in California are not like these. Jul-Sep. \*Grub Gulch T14N R68E S5, !Osceola Road 39° 06' 37" 114° 22' 13" Clifton 11462, Sacramento Pass 730 140E 43 35 800N Clifton 52144.

var. *subaridum* Stokes (Plate 656)

FERRIS'S SULPHUR FLOWER. Frequent, 5800-9000 ft.; open rocky, brushy slopes. Jul-Sep. Baker Creek T13N R69E S14, \*Snake Creek T12N R69E S9.

*Eriogonum villiflorum* A. Gray (Plates 657a, b)

SHAGGY HAIR BUCKWHEAT. Fairly frequent, below 7000 ft.; dry gravelly flats, mainly on limestone. May-Jul. \*Big Wash T12N R70E S27, \*between John's and Big Spring Wash T10N R69E S29.

### JOHNNESHOWELLIA

*Johnneshowellia puberula* (S. Wats.) Rev.

RED CREEK HOWELL'S-BUCKWHEAT. In frequent below 9,000 ft.; steep limestone slopes. May-Aug. \*†Cave Canyon 748 017E 43 12 349N, †Dry Canyon 733 135E 4361525N Clifton 48899. [*Eriogonum* p. S. Wats.].

### OXYRIA

*Oxyria digyna* (L.) Hill (Plate 658)

MOUNTAIN SORREL. Frequent, above 9500 ft.; crevices, steep rocky slopes among boulders. Jun-Aug. \*above Stella Lake T13N R68E S11, †Highland Ridge 734 750E 43 06 771N.

### PERSICARIA Smartweed

1 Plants with elongate slender extensively creeping rhizomes and stolons, often floating. . . . . *P. amphibia*

1 Plants not as above

2 Upper margins of ocreae (sheaths) lacking well developed cilia or bristles. . . . . *P. lapathifolia*

2 Upper margins of ocreae bearing well developed bristles. . . . . *P. maculata*

*Persicaria amphibia* (L.) S. Gray (Plates 659a, b)

AMERICAN KNOTWEED; WATER SMARTWEED. Infrequent, below 6200 ft.; standing water. \*The Cedars T12N R67E S2, †Spring Valley 722 768E 43 01 566N Clifton 45649, †Lake Creek 239 834E 43 06 428N Clifton 44989.

*Persicaria lapathifolia* (L.) S. Gray (Plates 660a, b)

DOCK-LEAVED SMARTWEED. Limited, about 5370 ft.; streamsides. This taxon is different from all the others in that it has the veins on the perianth segments that look like an anchor, sometimes hard to see. There are numerous named varieties of this taxon that have been recognized at various times. Most of the plants in California have the lower surface of the leaves very veiny, a drooping inflorescence, white flowers and are very tall. This one may be the species, however there is no mention of the flowers being white for this species in any text. The plants in this area look more like var. *salicifolia*, which is a short plant without the drooping inflorescence, however the lower surface of the leaves are not covered by dense lanate hairs. Most authors refuse to recognize any varieties, however their description of the species doesn't even remotely cover all the named varieties. Jul-Oct. †Lake Creek 760 026E 43 06 776N Clifton 41069.

*Persicaria maculata* (Raf.) Small

LADY'S THUMB or SPOTTED SMARTWEED. below 7,000 ft.; wet places; introduced from Eurasia. This taxon has been reported for this area. Jun-Sep. [*Polygonum persicaria* L.].

**POLYGONUM** Knotweed

- 1 Stem ± round, ± 8-16 ribbed
  - 2 The leaves at the distal end of the inflorescence branches overtopping the flowers ..... *P. aviculare*
  - 2 The leaves at the distal end of the inflorescence branches shorter than the flowers..... *P. argyrocoleon*
- 1 Stem ± sharply angled (esp just below the nodes)
  - 3 Leaves confluent with the ocreae
    - 4 Plants usually not of moist places, inflorescence with the nodes quit long. .... *P. douglasii*
    - 4 Plants of moist places; inflorescence with the nodes very close ..... *P. kelloggii*
  - 3 Leaves free from the ocreae. .... *P. 'terra-sterilis'*

***Polygonum argyrocoleon*** Steud. ex Kunze (Plates 661a, b)

SILVER-SHEATH or PERSIAN KNOTWEED. Infrequent, below 6000 ft.; irrigation ditch margins and other waste places; introduced from sw Asia. Jun-Aug. †Minerva 726 787E 43 00 254N Clifton 44570, †Baking Powder Flat 722 640E 43 01 620N Clifton 52112.

***Polygonum aviculare*** L. complex (Plates 663a, b)

KNOTWEED. Fairly frequent, below 8000 ft.; margins of wet places, along dirt roads and other waste places. There have been a number of varieties named for this taxon, but the characters used are not consistent. Also when looking at the plants they look the same and they most often grow together, at least the ones that can grow in this area. Jun-Aug. \*Murphy Wash 731 786E 42 90 365N Clifton 44981. [var. *buxiforme* (Sm.) Costea & Tardif, var. *neglectum* (Bess.) Arcangeli].

***Polygonum douglasii*** Greene

**Note;** This group of plants are extremely variable, from open to congested inflorescence, from erect to spreading to declined flowers; flowers that stay closed or some or all becoming partly open. The varieties have now been made species which seems kind of arbitrary.

- a Fruit deflexed. .... var. *douglasii*
- a Fruit mostly erect, sometimes the lower spreading..... var. *johnstonii*

var. *douglasii* (Plate 662)

DOUGLAS' KNOTWEED. Frequent, below 9000 ft.; road ditches; openings in woodlands.. Jun-Sep. \*Wheeler Peak Road T13N R69E S6, \*Dead Lake T12N R69E S6, †South Fork Baker Creek 738470E 4317220N Clifton 48843

var. *johnstonii* Munz (Plates 664a, b)

JOHNSTON'S KNOTWEED. Locally frequent, below 8000 ft.; along dirt roads, open dry places in woodlands. Jul-Aug. \*Baker Creek 739 216E 43 18 721N, †Wheeler Peak Trail 733 116 43 21442. [*P. sawatchense* Small].

***Polygonum kelloggii*** Greene (Plate 665)

KELLOGG'S KNOTWEED. Fairly frequent, 7500-10400 ft.; moist places that become dry. This taxon is enough different from the *P. polygaloides* complex to be left separate. Jun-Sep. \*Stella Lake T13N R68E S11, †Wheeler Peak Road 738 110E 43 22 760N Clifton 48879.

***Polygonum*** 'terra-sterilis' (Plates 666a, b)

BARREN GROUND KNOTWEED. Limited. 6960 ft.; barren limestone chiprock in openings in pinyon-juniper woodland. This new taxon is in the section Duravia and is in the group of plants that include *P. bidwelliae*, *P. californicum*, *heterosepalum*, *hickmanii*, and *parryi*. These have the leaves not confluent with the ocreae. This taxon stands alone among this genus, at least in North America in that the perianth is rough (see 666b of the dried flower). Jul-Aug. Pole Canyon 729 662E 43 08 210N Clifton 44566.

**RUMEX** Dock

- 1 Leaves normally hastate; fruiting valves up to 2 mm long..... *R. acetosella*
- 1 Leaves normally entire; fruiting valves longer than 2 mm
  - 2 Stems erect; basal leaves present. .... *R. crispus*
  - 2 Stems ascending to decumbent; usually leafless at the base..... *R. salicifolius*

***Rumex acetosella*** L. (Plates 667a, b)

SHEEP SORREL. Infrequent, below 7000 ft.; waste places, meadows, along streams; introduced from Eurasia. May-Sep. \*Baker Creek T13N R69E S22.

***Rumex crispus* L.** (Plates 668a, b)

CURLY LEAF DOCK. Fairly frequent, below 8000 ft.; dry to moist places; introduced from Eurasia. Jun-Sep. \*The Cedars T13N R67E S34, \*Baker Creek T13N R69E S22, !Burnt Mill Canyon T13N R69E S6.

***Rumex fueginus* Phil.**

GOLDEN DOCK. Infrequent, below 5000 ft.; margins of ponds and sluggish streams. Jun-Sep. Caine Spring 755188E 4336118N Clifton 47300.

***Rumex salicifolius* Weinm.**

**Note:** These taxa have been elevated to species status by some.

a Valves lacking a thicken ridge. . . . . var. *denticulatus*

a Valves with at least one having a thicken ridge. . . . . var. *triangulivalvis*

var. *denticulatus* Torr.

CALIFORNIA WILLOW DOCK. Infrequent, 7700-10500 ft.; lake shores and other wet places. May-Sep. \*Stella Lake 11 07 32 277E 43 20 654N. [*R. californicus* Rech. f.].

var. *triangulivalvis* (Danser) C. Hitchc. (Plate 669)

TRIANGLE-VALVED WILLOW DOCK. Fairly frequent, below 9000 ft.; moist to wet place. Jul-Sep. \*Baker Creek T13N R69E S22, !Lehman Creek T13N R69E S12, Lake Creek 760029E 4306700N Clifton 49029. [*R. triangulivalvis* (Danser) Rech. f.].

**PORTULACACEAE** Purslane Family

**Note:** These have been put in Montiaceae by some

1 Plants tap-rooted, not growing in water. . . . . *Lewisia*

1 Plants with rhizomes and stolons, growing in water. . . . . *Crunocallis*

***Claytonia perfoliata* Donn** (Plates 670a, b)

MINER'S LETTUCE. Limited, about 7320 ft.; in riparian. The subspecies in this group are based on leaf shape, which several shapes can sometimes be found in the same population. Jun. Pine Creek 727 793E 43 18 671N Clifton 45625. [ssp. *intermontana* Miller & Chambers]

**CRUNOCALLIS**

(*Montia*)

***Crunocallis chamissoi* (Ledeb.) Rydb.** (Plate 671)

TOAD-LILY. Frequent, 6300-10400 ft.; wet places. Jul-Aug. !Lehman Creek T13N R69E S8, \*Baker Creek 738 578E 43 17 448N, !Burnt Mill Canyon T13N R69E S6. [*Montia c.* (Spreng.) Greene]

**LEWISIA**

1 Stamens 30-50; leaves nearly terete. . . . . *L. rediviva*

1 Stamens 4-12; leaves mostly flat

2 Sepals toothed, 2-5 mm long; leaves normally linear. . . . . *L. pygmaea*

2 Sepals entire, 5-10 mm long; leaves often narrowly oblanceolate. . . . . *L. nevadensis*

***Lewisia nevadensis* (A. Gray) Robins.**

NEVADA LEWISIA. Infrequent, 9500-11000 ft.; moist to wet meadows. This taxon may be in this range somewhere. Jul-Aug.

***Lewisia pygmaea* (A. Gray) Robins.** (Plates 672a, b, c)

ALPINE LEWISIA. Frequent, 8000-10500 ft.; moist to wet meadows, slopes in alpine turf. Jun-Aug. !Stella Lake T13N R68E S11, Baker Lake 732 780E 43 15 200N Clifton 40984, †Mount Washington 733 857E 43 11 552N Clifton 45284, \*†Wheeler Peak 731 979 43 20 122 Clifton 42957, †Highland Ridge 736 923 4305896 Clifton 44526, West of Big Canyon 739 530E 43 53 430N, †Wheeler Peak Road 738 110E 43 22 760N Clifton 48874.

***Lewisia rediviva* Pursh** (Plates 673a, b)

BITTER ROOT. Infrequent, below 10,000 ft.; open barren slopes. May-Jul. Lehman Ridge Raymond Jaindl., †Pine Creek 727

320E 43 18 520N Clifton 45629. [*L. r.* Pursh var. *minor* (Rydb.) A. Holmgren].

## PRIMULACEAE Primrose Family

**Note:** *Centunculus* and *Glaux* has been put in Myrsinaceae. *Dodecatheon* is a disconcerting feature in this family, they look like the flowers of Craneberry.

- 1 Plants annual; flower small, white. . . . . *Androsace*  
 1 Plants perennial; flowers reddish  
 2 Corolla lobes strongly reflexed; anther forming a tub around the style. . . . . *Dodecatheon*  
 2 Corolla flat; anther not forming a tub about the style. . . . . *Primula*

### ANDROSACE

*Androsace septentrionalis* L. (Plates 674a, b)

NORTHERN ANDROSACE. Frequent, above 9500 ft.; open rocky slope in moist crevices and alpine turf. The plants on Highland Ridge have densely pubescent stems, leaves are fairly pubescent, the calyx is quite glabrous. These plants could almost pass as var. *puberulenta* (Rydb.) K. Knuth. However it is extremely doubtful that the var. *puberulenta* is a real taxon or that even var. *subumbellata* G. Robb. is real either. Jun-Sep. \*Stella Lake T13N R68E S11, †Highland Ridge 734 750E 43 06 771N, !Wheeler Peak 731 696E 43 19 755N.

### DODECATHEON Shooting Star

- 1 Plants essential glabrous  
 2 Corolla and sepal lobes 4. . . . . *D. alpinum*  
 2 Corolla and sepal lobes 5. . . . . *D. pulchellum*  
 1 Plants copiously glandular-pubescent. . . . . *D. redolens*

*Dodecatheon alpinum* (A. Gray) Greene (Plate 675)

ALPINE SHOOTING STAR. Frequent, 7500-11000 ft.; meadows along streams and seeps. May-Aug. \*Lehman Creek T13N R68E S11, †Baker Creek 739 184E 43 18 776N, Branch of Big Canyon 739 257E 43 54 030N.

*Dodecatheon pulchellum* (Raf.) Merr.

var. *pulchellum* (Plate 676)

PRETTY SHOOTING STAR. Infrequent, below 6800 ft.; alkaline meadows. May-Jun. \*Hamlin Valley T10N R70E S12, †The Cedars 723 769E 43 12 662N Clifton 43910.

*Dodecatheon redolens* (Hall) H. J. Thompson

SCENTED SHOOTING STAR. Rare about 9,400 ft., wet streams. These plants have been misapplied to *D. jeffreyi*. Jun-Aug. \*†Blue Canyon 733 284E 43 24 176N Clifton 41046.

### PRIMULA Primrose

- 1 Plants growing along streams, large 10-60 cm tall. . . . . *P. parryi*  
 1 Plants growing on cliffs and talus slopes, small 0.1-10 cm tall. . . . . *P. nevadensis*

*Primula cusickiana* A. Gray

var. *nevadensis* (N. H. Holmgren) N. H. Holmgren & S. Kelso (Plate 677)

NEVADA PRIMROSE. Frequent, 8000-11600 ft.; crevices and rocky slopes on limestone. The type came from the Snake Range. Jun-Aug. \*branch of Lincoln Canyon T12N R68E S26, \*Mount Washington T12N R68E S11., †Highland Ridge 734 750E 43 06 771N. [*P. nevadensis* N. H. Holmgren].

*Primula parryi* A. Gray (Plate 678)

PARRY'S PRIMROSE. Fairly frequent, above 8500 ft.; along streams, moist crevices in rock. Jul-Aug. Lehman Creek T13N R68E S11, Mount Washington T12N R68E S11, !Baker Creek T13N R69E S30.

## PYROLACEAE Wintergreen Family

- 1 Corolla longer than broad; inflorescence with pedicels twisted to one side (secund). . . . . *Orthilia*

- 1 Corolla broader than long; inflorescence not twisted. . . . . *Pyrola*

### ORTHILIA

***Orthilia secunda*** (L.) House

ONE-SIDED WINTERGREEN. Infrequent, 8000-10300 ft.; mesic woodland floors, along streams. Jun-Aug.. \*below Johnson Lake T13N R68E S36.

### PYROLA Wintergreen

- 1 Leaves dark green, white mottled or whitened along the main veins. . . . . *P. picta*  
 1 Leaves uniformly green, dark to light in color  
 2 Petals pinkish, rose, or purplish  
   3 Style short, straight, only slightly exerted beyond the anthers; flowers less than 1 cm across. . . . . *P. minor*  
   3 Style long, curved, long exerted beyond the anthers; flowers over 1 cm across. . . . . *P. asarifolia*  
 2 Petals green or greenish-white. . . . . *P. chlorantha*

***Pyrola asarifolia*** Michx. (Plates 679a, b)

BOG WINTERGREEN. Infrequent, 6500-9000 ft.; riparian thickets. Jul-Sep. !Lehman Creek T13N R69E S8, Baker Creek 738 904E 43 18 235N, Pine Creek 729 162E 43 19 359N.

***Pyrola chlorantha*** Sw. (Plates 680a, b)

GREEN-FLOWERED WINTERGREEN. Fairly frequent, 8500-10000 ft.; mesic conifer forest floors. Jun-Aug. †Wheeler Peak Road 34 922E 43 23 498N, †Big Springs Wash 738 438E 43 01 049N Clifton 45249.

***Pyrola minor*** L. (Plates 681a, b)

SNOWLINE WINTERGREEN. Infrequent, 8000-10000 ft.; along streams and mesic conifer woods. Jun-Aug. \*Lehman Creek T13N R68E S11, †Lehman Creek 733 167E 43 21 075N, !Baker Creek T13N R69E S29.

***Pyrola picta*** Sm.

WHITE-VEINED WINTERGREEN. Limited, about ; open forest floors with very little ground cover. Late Jul-Aug. \*Dead Lake 735 800E 43 12 934N.

### RANUNCULACEAE Buttercup Family

- 1 Plants a vine; fruit an achene with a long hairy tail. . . . . *Clematis*  
 1 Plants herbs; fruit not as above  
 2 Plants annual  
   3 Plants tomentose; flowers yellow, obvious. . . . . *Ceratocephala*  
   3 Plants glabrous; flowers white, not obvious, may be lacking. . . . . *Myosurus*  
 2 Plants perennial  
   4 Flowers yellowish to bright yellow or reddish. . . . . *Ranunculus*  
   4 Flowers not yellow or reddish  
     5 Flowers with sepals only  
       6 Sepals not showy, not hairy on the outer surface  
       7 Sepals white; fruit berry-like; leaflet teeth acute . . . . . *Actaea*  
       7 Flowers greenish or greenish-white; fruit an achene; leaflet teeth rounded. . . . . *Thalictrum*  
     6 Sepals showy, silky-hairy on the outer surface. . . . . *Anemone*

### ACTAEA

**Note:** These plants don't belong in this family.

***Actaea rubra*** (Ait.) Willd. (Plates 682a, b)

WESTERN RED BANE-BERRY. Fairly frequent, 6700-9000 ft.; along streams, riparian, mesic woodland floors. May-Jul. \*Baker Creek 738 636E 43 17 440N.

## ANEMONE

*Anemone multifida* Poir.

CUT-LEAVED WIND-FLOWER. Infrequent 8700-10600 ft.; rock ledges, below cliffs. Late Jun-mid Jul. North Fork Big Wash 734 197E 43 10 336N, \*Big Spring Wash 740 008E 43 00 576N (NAD 83) Clifton 49048.

## CERATOCEPHALA

(Ranunculus)

*Ceratocephala testiculatus* (Crantz) Roth (Plates 683a, b)

PAIN-IN-THE-FINGER BUTTERCUP. Frequent, below 9000 ft.; waste places or invading native habitat; introduced from Eurasia. Mar-May. \*Murphy Wash 733 893E 42 92 749N Clifton 6550, Chalk Spring 738 254E 43 57 820N. [*Ranunculus* t. Crantz].

## CLEMATIS Virgin's Bower

*Clematis ligusticifolia* Nutt. (Plates 684a, b)

WHITE-FLOWERED VIRGIN'S BOWER. Fairly frequent, below 7,600 ft.; riparian. Jul-Aug. \*Snake Creek 753 500E 43 12 400N Clifton 48823, !Baker Creek T13N R69E S22, †Snake Creek 747 360E 43 11 200N, North Fork Big Wash 743 061E 43 08 336N.

## MYOSURUS

- 1 The beak of the akene almost as prominent as the body, at least half as long or more..... *M. apetalus*  
 1 The beak small, not near as prominent, way shorter than the body. .... *M. minimus*

*Myosurus apetalus* C. Gay (Plates 685a, b)

var. *montanus* (G. R. Campb.) Whittem.

MOUNTAIN BRISTLY MOUSETAIL. Limited, about 5760 ft. vernal wet depressions. May. †Shoshone Ponds 723 496E 43 12 590N Clifton 43917.

*Myosurus minimus* L. (Plates 686a, b)

COMMON MOUSETAIL. Limited, about 5760 ft.; vernal wet depressions. May. \*†Shoshone Ponds 723 496E 43 12 590N Clifton 43916.

## RANUNCULUS Buttercup

- 1 Plants submersed in water. .... *R. aquatilis*  
 1 Plants not submersed in water  
 2 Plants creeping by stolons. .... *R. cymbalaria*  
 2 Plants from tufted roots  
 3 Petals and sepals red purple or lined with red purple..... *R. andersonii*  
 3 Petals yellow and sepals greenish to brownish  
 4 Basal leaves simple and entire  
 5 Petals bright yellow, broad, 5; sepals not dropping at flowering..... *R. glaberrimus*  
 5 Petals cream, narrow, greater than 6; sepals dropping at flowering..... *R. alismifolius*  
 4 Basal leaves divided or if simple than margins not entire  
 6 Basal leaves pinnate to deeply lobed  
 7 Plants below 7000 ft.  
 8 Plants essentially glabrous; annual. .... *R. sceleratus*  
 8 Plants bearing spreading, long hairs; perennial..... *R. macounii*  
 7 Plants above 8000 ft.  
 9 Lobes of the lower leaves ± acute  
 10 The veins on the lobes of the leaves prominent; plants tall..... *R. 'serpentina'*  
 10 The veins on the lobes of the leaves not prominent; plant short..... *R. adoneus*  
 9 Lobes of the lower leaves broadly obtuse to rounded  
 11 Plants found on open alpine slopes, below snow banks or in turf..... *R. eschscholtzii*  
 11 Plants found in open woodland, often in aspen groves..... *R. inamoenus*

***Ranunculus adoneus*** A. Gray (Plates 687a, b)

ALPINE BUTTERCUP. Fairly frequent, 9500-11500 ft.; alpine turf, Jul-Aug. \*Johnson Lake T13N R68E S36, !Stella Lake T13N R68E S11, †Bald Mountain 732 543 43 22 350, †Highland Ridge 735 268E 43 05 887N Clifton 452675, The Table 742273E 4351786N (NAD 83) Clifton 47165. [R. a. A. Gray var. *alpinus* (S. Wats.) L. Benson, R. *eschsoltzii* Schlecht. var. *a.* (S. Wats.) C. L. Hitchc.].

***Ranunculus alismifolius*** Geyer

var. *montanus* S. Wats (Plate 688)

MOUNTAIN WATER-PLANTAIN BUTTERCUP. Infrequent, below 9500 ft.; meadows and other moist places. May-Jul. !Wheeler Peak Road T13N R69E S6, Timber Creek 737 843E 43 15 847N.

***Ranunculus andersonii*** A. Gray (Plates 689a, b)

ANDERSON'S BUTTERCUP. Infrequent, below 7500 ft.; openings in shrubs and pinyon-juniper. May-Jun. \*Big Wash T12N R70E S27, †Snake Creek 753 858E 43 11 705N Clifton 43990.

***Ranunculus aquatilis*** L.

var. *capillaceus* (Thuill.) DC. (Plates 690a, b)

THREAD-LEAF WATER-CROWFOOT. Limited, below 6500 ft.; slow moving water in streams, ponds. This is now called variety *diffusus*, however they have lumped all the other varieties and species that are in this group into this one taxon, which is a mistake. There is one group where the leaves don't collapse when taken from the water. Since this author doesn't know which of these varieties *diffusus* represents, tradition is follow here. May-Aug. \*Lehman Creek 745 281E 43 21 267N. [R. *trichophyllus* Chaix].

***Ranunculus cymbalaria*** Pursh (Plate 691)

MARSH or DESERT BUTTERCUP. Infrequent, below 8500 ft.; wet places. May-Sep. \*The Cedars T12N R67E S2, \*Baker Creek 739 203E 43 18 778N, Lehman Creek T13N R69E S12, !Willow Patch Spring T15N R68E S36, Silver Creek 740557E 4337820N (NAD 83) Clifton 47089. [var. *saximontanus* Fern.].

***Ranunculus eschsoltzii*** Schlecht.

var. *oxynotus* (A. Gray) Jeps. (Plates 692a, b)

WESTERN ALPINE BUTTERCUP. Limited, 10000-11300 ft.; alpine turf and meadows, rocky slopes, edges of snow banks. These plants are identical to the plants from the Warner Mountains in California. Jul-Aug. †above Stella Lake 732 253E 43 20 151N Clifton 42999.

***Ranunculus glaberrimus*** Hook.

var. *ellipticus* (Greene) Greene (Plates 693a, b)

ELLIPTIC-LEAVED SAGEBRUSH BUTTERCUP. Infrequent, below 11000 ft.; moist flat areas below snow banks in the alpine, margins of wet meadows. It may be more common at lower elevations, but would have to be looked for early in the season. The plants at Stella Lake have all leaves unlobed. Late May-Mid Jun. The Table 742 429E 43 52 660N (NAD 83) Clifton 47169, †\*Stella Lake 732 410E 43 20 880N Clifton 48883.

***Ranunculus inamoenus*** Greene (Plates 694a, b)

NELSON'S OR DRAB BUTTERCUP. Limited, 8000-9000 ft.; moist slopes. The varieties of this taxon are describing degrees of pubescence and leaf lobbing, but they are not consistent, so they are not recognized in this treatment. Jun-Jul. \*†Timber Creek 738 163 43 16 254 Clifton 42899, South Fork Baker Creek 737 208E 43 16 204N. [var. *alpeophilus* (A. Nels.) L. Benson].

***Ranunculus macounii*** Britt. (Plates 695a, b)

MACOUN'S BUTTERCUP. Limited to the North Snake Range where infrequent, about 6480 ft.; along streams. Jun-early Jul. Silver Creek 740 557E 43 37 820N (NAD 83) Clifton 47088.

***Ranunculus sceleratus*** L.

var. *multifidus* Nutt. (Plates 696a, b, c)

CURSED BUTTERCUP. Limited, about 5680 ft.; wet places. Jun-Nov. Layton Spring 720126E 4331547N.

***Ranunculus*** 'serpentina' (Plates 697a, b)

SNAKE RANGE BUTTERCUP. Rare, about 10000 ft.; streamside meadow. Not sure what these plants may or may not be related to. There were to few plants to warrant a collection. Jul. Lehman Creek above Wheeler Peak Campground.

**THALICTRUM** Meadow-rue

- 1 Plants 5-15 cm tall; inflorescence generally racemose. . . . . ***T. alpinum***
- 1 Plants mostly over 40 cm tall; inflorescence generally paniculate
- 2 Stamens and styles on separate plants; sepals green when present. . . . . ***T. fendleri***
- 2 Stamens and styles in the same flower; sepals whitish when present. . . . . ***T. sparsiflorum***

***Thalictrum alpinum*** L. (Plates 698a, b)

ALPINE or DWARF MEADOW-RUE. Rare, 10000-11000 ft.; rocky slopes and alpine turf. Jul-Aug. \*Pyramid Peak 733 783E 43 14 750N Clifton 40991.

***Thalictrum fendleri*** A. Gray (Plates 699a, b, c)

FENDLER'S MEADOW-RUE. Frequent, below 10000 ft.; riparian, mesic woodland. Jun-Jul. !Lehman Creek T13N R69E S8, \*Strawberry Creek T14N R69E S20, †Lexington Arch 742 398E 43 02 886N Clifton 41025.

***Thalictrum sparsiflorum*** Fisch. & C. Mey.

var. ***saximontanum*** Boivin

WESTERN FEW-FLOWERED MEADOW-RUE. Rare, about 7500 ft.; along streams. This site fills in a hole that was between the Toiyabe Range and the ranges in Utah. Late Jun-Jul. \*†Baker Creek 738 904E 43 18 235N Clifton 42853.

**RHAMNACEAE** Buckthorn Family**CEANOTHUS** Wild-lilac***Ceanothus martinii*** M.E. Jones (Plate 700)

UTAH MOUNTAIN-LILAC. Frequent, 7,000-10,000 ft.; open wooded slopes. Jun-Jul. !Wheeler Peak Campground T13N R68E S11, †Head of Pole Canyon 738 315 43 15 110, Pine Creek 728 430E 43 18 884N Clifton 45672.

**RHINANTHACEAE** Galea Family

(Scrophulariaceae in part)

**Note:** This group of plants are being placed in Orobanchaceae, however they don't even look like that group of plants. They also don't belong in Scrophulariaceae.

- 1 Well developed leaves double-crenate-dentate, crisped, with a cartilaginous-margin. . . . . ***Pedicularis***
- 1 Well developed leaves simple to several lobed, never crisped, with a cartilaginous-margin
- 2 Plants perennial, or if annual ©. *minor*) the floral leaves red . . . . . ***Castilleja***
- 2 Plants annual. . . . . ***Cordylanthus***

**CASTILLEJA** Indian Paintbrush

**Note:** There are numerous plants that key out to a species, but don't look like it. There are numerous plants that contain characters of two different taxa, as well as many different combinations that don't look like any named taxa. In the *C. applegatei* complex this author has many sheets with hardly on looking like the other. Likewise with the *C. chromosa* complex.

- 1 Plants annual; normally single stemmed from the base. . . . . ***C. exilis***
- 1 Plants perennial; normally branched from the base
- 2 Plants with the inflorescence bright yellow, quit glandular hairy as well a villous. . . . . ***C. 'serpentina'***
- 2 Plants not combing the above characters
- 3 Herbage glandular pubescent below the inflorescence; leaf margins ± wavy
- 4 The calyx more deeply cleft below than above. . . . . ***C. dissitiflora***
- 4 The calyx slightly more cleft above than below. . . . . ***C. applegatei***
- 3 Herbage not glandular pubescent below the inflorescence; leaf margins plane
- 5 The calyx more deeply cleft on the front side than the back which causes the corolla to project down through the deeply cleft front side. . . . . ***C. linariifolia***
- 5 The calyx ± equally cleft on the front and back
- 6 Galea 4-6 mm long; stems normally 0.4-1.5 dm tall. . . . . ***C. nana***
- 6 Galea 8-20 mm long; stems normally taller than 1.5 dm
- 7 Herbage green, ± glabrous; leaves entire; growing in meadows and along streams. . . . . ***C. miniata***
- 7 Herbage gray, variously hairy; at least upper leaves lobed; growing in drier places
- 8 The galea well exerted from the calyx; stems 0.7-1.5 (2) dm tall. . . . . ***C. scabrida***
- 8 The galea only slightly exerted from the calyx; stems ± erect 1.5-4.5 dm tall. . . . . ***C. chromosa***

***Castilleja applegatei*** Fern.

var. ***pinetorum*** (Fern.) N. Holmgren (Plates 701a, b)

WAVY-LEAVED INDIAN-PAINTBRUSH. Infrequent, below 9000 ft. dry rocky slopes and flats. These plants are quit short and the leaves are not hardly wavy margined. They don't look the plants from California. May-Jul. West of Mud Spring 734 750E 43 55 880N (NAD 83) Clifton 47186, †\*North branch Rye Grass Canyon 737 230E 43 63 142N Clifton 48918, Miller Basin 732 760E 43 44 415N Clifton 48998, head of Coyote Canyon 734 510E 43 67 075N Clifton 51311. [ssp. *p.* (Fern.) Chuang & Heckard

***Castilleja chromosa*** A. Nels. (Plates 702a, b, c)

DESERT INDIAN-PAINTBRUSH. Infrequent, below 8500 ft.; dry open slopes mostly in the pinyon-juniper belt. This is an extremely variable taxon from leaf shape to the different shapes and sizes of the flower. There are plants that have short broadly rounded calyx lobes. There are plants that have longer, narrower and more acute calyx lobes. There are plants that have the corolla only slight exerted while others have the corolla well exerted. The ones that have the more rounded lobes have the galea less than 13 mm long, these would qualify for *C. angustifolia*, but there are plants just like this in California where they are not supposed to be. This means that no one knows what any of these plants really are. There are plants that look like Plate 702b that have sparse glandular hairs throughout. May-Jun. \*Baker Creek 8,000 ft., Highway 894 726 418E 43 04 553N Clifton 43940 (short broadly rounded calyx lobes) Clifton 43941 (longer, narrower and more acute lobes)

***Castilleja dissitiflora*** N. Holmgren (Plates 703a, b)

MT. HAMILTON INDIAN-PAINTBRUSH. Fairly frequent, 7500-10000 ft., open sagebrush slopes. Jun-Jul. Big Canyon 740 555E 43 53 716N (NAD 83) Clifton 47179, \*Saddle between Arch Canyon and Big Spring Wash 740 515E 43 02 012N (NAD 83) Clifton 49047.

***Castilleja linariifolia*** Benth. (Plates 704a, b)

NARROW-LEAVED INDIAN or WYOMING PAINTBRUSH. Frequent, 7000-10000 ft.; open slopes. Jun-Oct.: \*Gray Cliff T13N R69E S22, Chalk Spring 738 254E 43 57 820N.

***Castilleja miniata*** Hook. (Plates 705a, b)

GREAT RED INDIAN or SCARLET PAINTBRUSH. Frequent, 7000-10700 ft.; meadows, streams other wet places, mesic, open woodlands, rocky slopes at high elevation. May-Sep. \*below Johnson Lake T13N R69E S36, !Lehman Creek T13N R69E S8.

***Castilleja minor*** (A. Gray) A. Gray (Plate 706)

LESSER ANNUAL PAINTBRUSH. Local, below 7000 ft.; wet places, often in saline places. late Jun-Aug. !Willow Patch Springs T15N R68E S36, \*Big Springs Creek T10N R70E S1, Caine Spring 755 174E 43 36 060 Clifton 52146. [*C. exilis* A. Nels.].

***Castilleja nana*** Eastw. (Plates 707a, b, c)

DWARF ALPINE INDIAN-PAINTBRUSH. Frequent, 9500-12000 ft.; open rocky slopes, ridges. Jun-Aug. !Ridge between Wheeler Peak and Bald Mountain, \*Stella Lake 733 263E 43 20 489N Clifton 36272, Deerhead Canyon 739 240E 43 52 845N (NAD 83) Clifton 47141. [*C. lapidicola* A. Heller].

***Castilleja scabrada*** Eastw.

var. ***barnebyana*** (Eastw.) N. Holmgren (Plates 708a, b)

BARNEBY'S PAINTBRUSH. Fairly frequent, below 10000 ft.; slopes, crevices, rocky places, often on limestone. May-Jul \*Snake Creek T12N R69E S10, \*branch of Lincoln Canyon T12N R68E S26, Pole Canyon 739 856E 43 14 377, between Murphy Wash and Johns Wash 732 287E 42 87 868N Clifton 43960, †Miller Basin Wash 732 290E 43 42 976N Clifton 48994. [*C. barnebyana* Eastw.].

***Castilleja*** 'serpentina' (Plates 709a, b)

SNAKE RANGE PAINTBRUSH. Infrequent, limited to the North Snake

#### CORDYLANTHUS Birdsbeak

- 1 Stems with short ± crinkly hair that often slightly points down. . . . . ***C. ramosus***  
 1 Stems glandular villosus  
 2 The apex of the lower sepal with lobes 1.2-3 mm deep; flowers 2-4 per head; flowers appearing bicolorous. . . . . ***C. kingii***  
 2 The apex of the lower sepal entire to dentate; flowers most often single sometimes 2 per head; flowers not appearing bicolorous. . . . . ***C. parviflorus***

***Cordylanthus kingii*** S. Wats. (Plates 710a, b)

KING'S BIRDSBEAK. Fairly frequent, below 9500 ft.; pinyon-juniper woodland, saline soil in chenopod scrub. Jun-Sep. !Osceola Road T14N R68E S5, \*Spring Valley T13N R67E S33, Saddle between Arch Canyon and Big Spring Wash 740515E 4302012N (NAD 83).

***Cordylanthus parviflorus*** (Ferris) Wiggins (Plates 711a, b)

PURPLE BIRDS BEAK. Infrequent, below 6500 ft.; open limestone slopes. Jul-Oct. †Snake Creek 748 030 43 12 245

***Cordylanthus ramosus*** Benth. (Plates 712a, b)

MUCH-BRANCHED BIRDS BEAK. Frequent, below 8,500 ft.; dry slopes and flats with sagebrush and pinyon-juniper, saline soil on small mound on valley floors. Jun-Aug. !Osceola Road T14N R68E S14, †Murphy Wash 731 170E 42 90 365N Clifton 44976, †\*Rye Grass Canyon 734775E 4361540N Clifton 48910, †Miller Basin Wash 733 420E 43 40 185N Clifton 48989, †Baking Powder Flat 721 950E 42 99 730N Clifton 52116.

### PEDICULARIS

*Pedicularis centranthera* A. Gray (Plates 713a, b)

DWARF LOUSEWORT. Frequent, below 10,600 ft.; May-July: \*Murphy Wash T10N R68E S2, Lincoln Canyon T12N R68E S14, !Baker Creek Road 741 639E 43 20 181N, †Murphy Wash 734 794E 42 96 424N Clifton 43958.

### ROSACEAE Rose Family

- 1 Plants herbaceous, if woody than extremely prostrate
- 2 Flowers in a cylindrical cluster; plants tightly appressed to the ground. . . . . *Petrophytum*
- 2 Flowers and plants not as above
- 3 Ovary and achenes quite hairy; styles at least 1 cm long, geniculate or plumose
- 4 The flowers yellow, not drooping; style geniculate in fruit. . . . . *Geum*
- 4 The flowers pinkish, drooping; styles plumose in fruit. . . . . *Sieversia*
- 3 Ovary and achenes smooth to reticulate; styles very short
- 5 Leaflets cuneate at the base, 2-5 toothed at the truncated apex, dark green. . . . . *Sibbaldia*
- 5 Leaflets not as above
- 6 Stamens 5, if 20 than petals white. . . . . *Ivesia*
- 6 Stamens 15 or more; petals yellow. . . . . *Potentilla*
- 1 Plants definitely shrubby
- 7 Leaves simple, if deeply divided than the margin are continuous with rachis
- 8 Leaves deeply divided or shallowly 3-lobed at the apex. . . . . *Purshia*
- 8 Leaves variously toothed to entire
- 9 Leaves entire
- 10 Flowers lacking petals; leaves usually revolute, tough. . . . . *Cercocarpus*
- 10 Flowers with well developed petals; leaves not revolute, thinner. . . . . *Peraphyllum*
- 9 Leaves variously toothed, sometimes remotely so
- 11 Leaves remotely serrate to ± entire. . . . . *Peraphyllum*
- 11 Leaves obviously serrate to toothed
- 12 Leaves wedge shaped at their base, inflorescence pyramidal. . . . . *Holodiscus*
- 12 Leaves ± rounded at base
- 13 Serrations very fine, along entire margin of the leaf. . . . . *Prunus*
- 13 Serrations coarser, bottom part of the margin normally entire. . . . . *Amelanchier*
- 7 Leaves pinnate
- 14 Leaves at least 2-twice pinnate; plants aromatic. . . . . *Chamaebatiaria*
- 14 Leaves simple pinnate; plant not aromatic
- 15 Leaves 3-foliolate;. . . . . *Rubus*
- 15 Leaves greater than 3-foliolate
- 16 Stems strongly thorny; petals rose. . . . . *Rosa*
- 16 Stems not armed; petals yellow. . . . . *Pentaphylloides*

### AMELANCHIER Service-berry

**Note:** It is almost impossible to separate all specimens in the *alnifolia-utahensis* complex. The key features show overlap, and while trends are apparent in these plants, the best of the characters fail singly and often in combination as well. The leaf being pubescent or not, doesn't hold true all the time. There are more specimens that incorporate characters for both than there are that don't. As far as this author can see there is really only one species with numerous variations that insert themselves in various places throughout the range of the species. If only one species is involved, than since *A. alnifolia* was published first, it would be the proper name for all.

*Amelanchier alnifolia* (Nutt.) Nutt. (Plates 714a, b, c, d)

WESTERN SERVICE-BERRY. Infrequent, 7000-10,000 ft.; open forest floors, often on the mesic side. May-early July.

!Wheeler Peak Campground T13N R68E S11, \*Baker Creek 739 571E 43 19 192N, !Baker Creek T13N R69E S22, !Lehman Creek T13N R69E S8 Clifton 11718, !Grub Gulch T14N R68E S7.. [*A. utahensis* Koehne]

### CERCOCARPUS Mountain Mahogany

- 1 Leaf margins revolute, turned to the midrib causing the leaf to appear almost terete. . . . . *C. intricatus*  
 1 Leaf margins somewhat revolute, not turned to the midrib, not appearing terete. . . . . *C. ledifolius*

*Cercocarpus intricatus* S. Wats. (Plates 715a,b)

SMALL-LEAVED MOUNTAIN MAHOGANY. Fairly frequent, 6500-9000 ft.; steep slopes that are often rocky. \*Tungsten Queen Mine T11N R68E S16, †Gray Cliff 740 470E 43 19 049E Clifton 40966.

*Cercocarpus ledifolius* Nutt.

var. *intermontanus* N. Holmgren (Plates 716a, b)

CURL-LEAF MOUNTAIN MAHOGANY. Frequent, 6500-9000 ft.; slopes and flats, often forming large patches. May-Jul. !Grub Gulch T14N R68E S7, !Burnt Mill Canyon T13N R69E S6.

### CHAMAEBATIARIA

*Chamaebatiaria millefolium* (Torr.) Maxim. (Plates 717a, b)

FERN BUSH, DESERT SWEET. Frequent, 6500-10000 ft.; dry brushy slopes. May-Sep. \*Gray Cliff T13N R69E S22, North Fork Big Wash 743 061E 43 08 336N, †North Fork Big Wash 736 386E 43 08 327N Clifton 44535, Chalk Spring 738 254E 43 57 820N.

### GEUM Avens

- 1 Sepals reflexed in flower; mature styles strongly geniculate and jointed, the ultimate segment falling early. . . . . *G. macrophyllum*  
 1 Sepals ascending to erect; mature styles not obviously geniculate. . . . . *Geum rossii*

*Geum macrophyllum* Willd. (Plates 718a, b)

LARGE-LEAVED AVENS. Frequent, 6000-9000 ft.; along streams, meadows, riparian. As the photo shows, the end, large leaflet is that of the plants that grow west of the Cascade-Sierran axis. Jun-Jul. Lehman Creek T13N R69E S8, !Burnt Mill Canyon T13N R69E S6, †Shingle Creek 729 200E 43 20 536N Clifton 45684, \*Baker Creek 739 050E 43 18 640N Clifton 48813. [var. *perincisum* (Rydb.) Raup].

*Geum rossii* ®. Br.) Ser.

var. *turbinatum* (Rydb.) C.L. Hitchc. (Plates 719a, b)

ROSS AVENS. Frequent, above 9500 ft.; open rocky slopes, alpine turf, moist places, alpine meadows. Jul-Aug. \*above Johnson Lake T13N R68E S36, !Stella Lake T13N R68E S11.

### HOLODISCUS Spray

*Holodiscus dumosus* (Nutt.) A. Heller (Plates 720a, b)

MOUNTAIN SPRAY. Frequent, 6500-9500 ft.; open rocky places, dry slopes, canyon walls. The plants that grow in this range are called variety *glabrescens* because they are glabrous or glabrate beneath, but that is the only difference that separates it from the species. Jun-Aug. !Burnt Mill Creek T13N R69E S6, †Gray Cliff 740 470E 43 19 049N Clifton 40964, Chalk Spring 738 254E 43 57 820N.

### IVESIA

- 1 Plants from low alkaline areas on valley floors; petals white; stamens 20. . . . . *I. kingii*  
 1 Plants from crevices in rock on mountain slopes; petals yellow; stamens 5. . . . . *I. shockleyi*

*Ivesia kingii* S. Wats. (Plates 721a, b)

KING'S or ALKALI IVESIA. Infrequent, below 6000 ft.; alkaline meadows. \*Hamlin Valley T10N R70E S1, †The Cedars 723 809E 43 12 600N Clifton 40955.

*Ivesia shockleyi* S. Wats.

var. *ostleri* Ertter

OSTLER'S IVESIA. Limited, 9400-9600 ft.; crevices of large quartz boulders in mountain mahogany. The leaflets are fewer than they should be, but these plants don't look like the species. These plants are about 1400 ft. higher in elevation than the ones in Utah. Late Jun-early Jul. \*†branch of Decathon Canyon 738 375E 43 00 409N Clifton 45245.

### PENTAPHYLLOIDES

*Pentaphylloides fruticosa* (L.) Schwarz (Plates 722a, b)

SHRUBBY CINQUEFOIL. Infrequent, 9500-11000 ft.; open rocky, mesic slopes, alpine meadows. The plants of the New World have been called ssp. *floribunda* based on  $2n=14$  whereas the Old world are  $2n=28$ , but the difference out in the field are not at all that much discernable. Since *floribunda* and *fruticosa* are considered the same thing under *Potentilla*, Then, if transferred to *Dasiphora*, they would have to be called *Dasiphora floribunda* because in that genus *floribunda* was published in 1840 well before it was published as *fruticosa*. However, if *fruticosa* is keep, than it would be *Pentaphylloides fruticosa* as used in the Intermountain flora. This is because it was not called *Pentaphylloides floribunda* until 1954. Since *fruticosa* was first used it will be use here. Jul-Sep. \*Johnson Lake T13N R68E S36. [*Dasiphora fruticosa* (L.) Rydb., *Potentilla f. L.*].

### PERAPHYLLUM

*Peraphyllum ramosissimum* T. & G. (Plates 723a, b)

SQUAW APPLE. Infrequent, 7000-8000 ft.; washes, slopes. Jun-Jul. \*Lincoln Canyon T12N R68E S19, Snake Creek 748 534E 43 11 671N.

### PETROPHYTUM

*Petrophytum caespitosum* (Nutt.) Rydb. (Plates 724a, b)

ROCK-SPIRAEA. Frequent, 5600-10400 ft.; limestone rocky slopes and cliffs. There is a very weak variety that grows in California on limestone. Jul-Sep. \*Gray Cliff T13N R69E S22, \*head of Lincoln Canyon T12N R68E S14, †Mt. Washington Road 731 378E 43 07 738N.

### PHYSOCARPUS

*Physocarpus alternans* (M.E. Jones) J. T. Howell (Plate 725)

NEVADA or DWARF NINEBARK. Infrequent, 5800-7200 ft. dry rocky canyons, limestone slopes, along the lower margin of cliffs. May-Jul. \*Gray Cliff T13N R69E S22.

### POTENTILLA Cinquefoil

**Note: A lot of plants will key to no one taxon.** Distinctions sometimes are vague because of hybridization and apomixis through agamospermy. *P. glandulosa* group of plants have been put back in the old genus *Drymocallis* but will not be followed here because they still look like *Potentilla*.

- 1 Plants stoloniferous; flowers in the axils of the leaves that are on the stolons. . . . . *P. anserina*
- 1 Plants lacking stolons; inflorescence generally cymose
- 2 Styles attached almost at the base of the achenes. . . . . *P. glandulosa*
- 2 Styles attached at or near the apex of the achenes
- 3 Styles 0.5-1.2 mm long, usually shorter than the achene
- 4 Leaves fairly hairy on the lower surface
- 5 Principal basal leaves with their rachis long. . . . . *P. pensylvanica*
- 5 Principal basal leaves with their rachis very short or lacking
- 6 Principal basal leaves 3-foliolate, rarely 5. . . . . *P. holmgrenii*
- 6 Principal basal leaves 5-foliolate (7). . . . . *P. rubricaulis*
- 4 Leaves green on the lower surface
- 7 Leaflets at least below 5-9. . . . . *P. rivalis*
- 7 Leaflets 3
- 8 Herbage glandular-pubescent and viscid-villous with fine, soft hairs; achenes smooth. . . . . *P. biennis*
- 8 Herbage hirsute (eglandular) with rather stiff, spreading hairs, at least below; achenes wrinkled. . . . . *P. norvegica*
- 3 Styles 1.3-4 mm long

- 9 Plants with the leaves glabrous except margins and veins, glaucous when fresh, stems base glabrous. . . . *P. glaucophylla*
- 9 Plants not combining the above characters
- 10 The largest basal leaves with the rachis of the largest leaflets shorter than the length of the longest lobes  
 . . . . . *P. multisecta*
- 10 The leaves not as above
- 11 The largest basal leaves distinctly pinnate. . . . . *P. ovina*
- 11 The largest basal leaves appearing palmate, leaf rachis very short if not truly palmate
- 12 Outer surface of the calyx and the upper surface of the inflorescence leaves finely glandular hairy. *P. pulcherrima*
- 12 Outer surface of the calyx and upper surface lacking glandular hairs
- 13 The largest leaflets usually over 20 mm long . . . . . *P. gracilis*
- 13 The largest leaflets usually less than 20 mm long. . . . . *P. concinna*

***Potentilla anserina*** L. (Plate 726)

SILVERWEED. Locally frequent, below 7500 ft.; saline springs and meadows. May-Aug. !Willow Patch Springs T15N R68E S36, \*The Cedars T12N R67E S2, Strawberry Creek 736 920E 43 27 093N.

***Potentilla biennis*** Greene (Plates 727a, b)

BIENNIAL CINQUEFOIL. Infrequent, below 9600 ft.; often a weedy species, moist roadsides, streambanks, thickets in riparian. May-Aug. \*The Cedars 723 809E 43 12 600N †Clifton 40948.

***Potentilla concinna*** Richards. (Plates 728a, b)

EARLY CINQUEFOIL. Fairly frequent, 8000-11400 ft.; rocky ridges, and slopes, meadows, open mesic forest floors. Late May-early Aug. \*Mt. Washington Road 733 040E. 43 08 693N, †Wheeler Peak 731 974 43 20 724, The Table 742 275E 43 52 576N (NAD 83) Clifton 47172. [ var. *divisa* Rydb.].

***Potentilla glandulosa*** Lindl.

There is often a contiguum of variation that links the varieties or species in various places.

- a Herbage glandular nearly throughout. . . . . var. *pseudorupestris*  
 a Herbage eglandular above. . . . . var. *nevadensis*

var. *nevadensis* S. Wats.

NEVADA STICKY CINQUEFOIL. Widely scattered, 7500-10000 ft.; open slopes, woodlands, drying streambanks, rocky places. Jun-July \*Burnt Mill Canyon 39° 01' 45", 114° 15' 40". [*Drymocallis lactea* (Greene) Rydb., ssp. *nevadensis* (S. Wats.) Keck

var. *pseudorupestris* (Rydb.) Breitung (Plates 729a, b)

LARGE STICKY CINQUEFOIL. Frequent 9500-11500 ft.; alpine turf, rocky slopes meadows. This has been made a species by some, but they is to much Jul-Aug. \*above Johnson Lake T13N R68E S36, †Stella Lake 732 009 43 20 197. [*Drymocallis p.* (Rydb.) Rydb., ssp. *pseudorupestris* (Rydb.) Keck].

***Potentilla glaucophylla*** Lehm. (Plates 730a, b, c)

ALPINE or MOUNTAIN MEADOW CINQUEFOIL. Fairly frequent, 9000-11400 ft.; meadows, alpine turf, rocky slopes and ridges. As the name implies, the leaves and pubescence are extremely variable. The plants that are not glaucous may be something else. Jun-July. \*Wheeler Peak T13N R68E S14, †Wheeler Peak Trail 732 609 43 21 307. [*P. diversifolia* Lehm., misapplied].

***Potentilla gracilis*** Dougl. ex Hook.

**Note:** Making varieties in this group of plants is essentially a waste of time. The types of pubescence often doesn't correlate with the depth of the lobes of the leaflets. Within a single population there may be shallow and deep toothed leaflets.

- a The leaflets lobbed less than ½ the distance to the rachis. . . . . shallow toothed forms  
 a The leaflets lobed greater than ½ the distance to the rachis. . . . . deep toothed forms

deep toothed forms (Plates 731a, b, c)

Fairly frequent, below 9500 ft.; dryer parts of meadows, open, mesic woodlands, riparian. There are some plants that are silver colored on the lower surface with the margins somewhat revolute, but the hairs are of plants that have been called variety *elmeri* which is supposed to be grayish and not revolute margined. Jun-Aug. !Burnt Mill Creek 39° 01' 45" 114° 15' 40", Lehman Creek 739 486E 43 21 782N, \*Baker Creek 739 865E 43 19 300N Clifton 48817, \*Minerva 726 787E 43 00 254N Clifton 44570, Lehman Creek, Baker Ranch 750 266E 43 22 135n Clifton 48861.

in between forms (Plates 733a, b)

shallow toothed forms (Plates 732a, b, c, d)

Fairly frequent, 6500-9500 ft.; along streams, meadows. Jun-Aug. !Lehman Creek 39° 00' 47" 114° 15' 12", \*Baker Creek 739865E 4319300N Clifton 48818, Lehman Creek 736 075E 43 21 950N Clifton 48970.

***Potentilla holmgrenii*** D. F. Murry & Elven (Plates 734, b, c)

HOLMGREN'S CINQUEFOIL. Infrequent, above 10200 ft.; rocky slopes and ridge tops, alpine turf. Jul-Aug. \*Wheeler Peak T13N R68E S14, The Table 742 249E 43 51 786 (NAD 83) Clifton 47159. [*P. nivea* L., misapplied].

***Potentilla multisecta*** (S. Wats.) Rydb. (Plates 735a, b, c)

NORTHERN CINQUEFOIL. Infrequent, 8000-11400 ft.; rocky open slopes. May-Jul. !Wheeler Peak Campground Road T13N R69E S6, †\*Mill Creek 736 140E 43 23 766N Clifton 48886.

***Potentilla norvegica*** L.

var. *hirsuta* (Michx.) Lehm. (Plates 736a, b)

NORWEGIAN CINQUEFOIL. Limited, at about 9600 ft. lake shores. The variety represents the native plants. Jul. \*Dead Lake T12N R69E S6.

***Potentilla ovina*** Macoun

a Leaflets deeply parted into more than 6 segments, this appearing like the leaflets are fascicled, whitish from the hairs. . . . . var. *ovina*  
a Leaflets not as deeply parted, base expanded, blade obvious, greenish, often sufficed with red. . . . . var. *decurrens*

var. *decurrens* (S. Wats.) S. Welsh & B. Johnst. (Plates 737a, b)

GLABRATE SHEEP CINQUEFOIL. Fairly frequent, 9500-12000 ft.; rocky slopes, alpine turf, open woods. July-Aug. \*Wheeler Peak T13N R68E S14.

var. *ovina* (Plates 738a, b)

SHEEP CINQUEFOIL. Limited, 10000-12000 ft.; rocky slopes, alpine turf. July-Aug. \*Wheeler Peak T13N R68E S14, The Table 742 275E 43 52 576N (NAD 83) Clifton 47171.

***Potentilla pennsylvanica*** L. (Plates 739a, b)

PENNSYLVANIA CINQUEFOIL. Infrequent, 8,500-11,500 ft.; rocky open slopes. June-Aug. \*†Ridge between Wheeler Peak and Bald Mountain 731 732E 43 21 674N, †Horse Heaven 743 240E 43 14 244N Clifton 45302, The Table 741 944E 43 52 615N (NAD 83) Clifton 47177.

***Potentilla pulcherrima*** Lehm.

HAIRY-LEAVED SLENDER CINQUEFOIL. Infrequent, 10000-11000 ft.; dryer parts of meadows and riparian. Jun-Jul. †Stella Lake 732 428E 43 20 625N Clifton 42985. (*P. gracilis* Dougl. ex Hook. var. *p.* (Lehm.) Fern.].

***Potentilla rivalis*** Nutt.

BROOK CINQUEFOIL. Infrequent, along streams. Pictures of this taxon were taken on Lehman Creek.

***Potentilla rubricaulis*** Lehm. (Plates 740a, b)

RED-STEMMED CINQUEFOIL. Infrequent, 10000-11400 ft.; meadows, rocky slopes and ridges, talus. July-Aug. \*†Wheeler Peak 731 794E 43 19 809N.

## PRUNUS

***Prunus virginiana*** L.

a Fruit red, it dries early, leaves larger with obvious sharp teeth; inflorescence glabrous. . . . . var. *demissa*  
a Fruit black, it is still juicy after the preceding; leaves small with short teeth; inflorescence with the rachis having some  
canescent hairs. . . . . var. *melanocarpa*

var. *demissa* (Nutt.) Torr. (Plates 741a, b)

WESTERN CHOKECHERRY. Infrequent, 6500-8500 ft.; riparian, slopes in canyons. The red fruited plants look just like the ones from Plumas County in California in all respects. The southern plants in California have pubescent leaves. There are trends in these plants, but they seem to vary from place to place without any geographical correlatable characters. However until a study is done for these plants, the two varieties will be left intact. \*Baker Creek 739 168E 43 18 674N.

var. *melanocarpa* (A. Nels.) Sarg. (Plate 741b)

BLACK FRUITED WESTERN CHOKECHERRY. Frequent, 6500-9400 ft.; moist slopes, \*Baker Creek 739 957E 43 19 278N.

## PURSHIA

1 Leaves mainly 5-lobed; styles plumose 2-6 cm long. . . . . *P. stansburiana*

1 Leaves mainly 3-lobed; styles puberulent, under 1 cm long. . . . . *P. tridentata*

*Purshia stansburiana* (Torr.) Henr. (Plates 742a, b)

CLIFF-ROSE. Frequent, below 7800 ft. openings in pinyon-juniper, brush slopes. May-Aug. \*Pole Canyon 730 459E 43 08 654N.

*Purshia tridentata* (Pursh) DC. (Plates 743a, b)

BITTER BRUSH. Infrequent, below 9,000 ft.; openings in pinyon-juniper woodland. May-July. \*!Baker Creek Road T13N R69E S15.

## ROSA

*Rosa woodsii* Lindl. (Plates 744a, b)

WOODS' ROSE. Frequent, below 9000 ft.; wooded slopes, riparian. The varieties and species within this genus at times seem to be rather arbitrary. There are extremes that look quite different, but there are many plants that tie these extremes together. Overdue emphasis is placed on the placement of gland-tipped bristles or glands on the tips of leaf teeth. These characters seem to show up in various places and not in others. There are forms of *R. pisocarpa* that are essentially identical to what has been called var. *ultramontana*. This author has collected this form of *R. pisocarpa* well out of the range of what has been called *ultramontana*, in western Washington. Jun-Jul. !Lehman Creek T13N R69E S8, Chalk Spring 738 254E 43 57 820N, \*Baker Creek 739 865E 43 19 300N Clifton 48819. [var. *ultramontana* (S. Wats.) Jeps., ssp. *u.* (S. Wats.) R. L. Taylor & Macbr.]

## RUBUS

*Rubus idaeus* L.

var. *strigosus* (Michx.) Maxim. (Plates 745a, b)

AMERICAN RED RASPBERRY. Frequent, 6000-11000 ft.; riparian, limestone crevices, rocky wooded slopes, rock fields. Mid June-Aug. !Burnt Mill Creek T13N R69E S6, †Gray Cliff 740 470E 43 19 049E Clifton 40965, \*Baker Creek 738 990E 43 18 470N Clifton 48814.

## SIBBALDIA

*Sibbaldia procumbens* L. (Plates 746a, b)

SIBBALDIA. Fairly frequent, 9500-11000 ft.; alpine turf, meadows, mesic rocky slopes. June-Aug. \*above Johnson Lake T13N R68E S36, !Pyramid Peak 733 957E 43 14 786N.

## SIEVERZIA

*Sieversia triflora* (Pursh) R. Br. (Plates 747a, b, c)

PURPLE AVENS, OLD MAN'S WHISKERS. Infrequent, 7000-9000 ft., North Snake Range; dryer part of meadows, open rocky slopes. This is a very disconcerting feature in the genus *Geum*. Jun-Jul. Chalk Spring 738 254E 43 57 820N, \*Ptomaine Springs Ridge 734 100E 43 65 650N Clifton 51317. [*Geum t.* Pursh var. *ciliatum* (Pursh) Fassett].

## RUBIACEAE Madder Family

### GALIUM Bedstraw

- 1 Leaves in whorls of 5-8
- 2 Plants annual; stems and leaves will cling to cloth. . . . . *G. aparine*
- 2 Plants perennial; stems and leaves not clinging to cloth
- 3 Corolla lobes usually 3; leaves small. . . . . *G. trifidum*
- 3 Corolla lobes 4; leaves quite large. . . . . *G. triflorum*
- 1 Leaves in whorls of 4
- 4 Plants perennial
- 5 Plants of meadows, streams; leaves rounded or obtuse. . . . . *G. trifidum*
- 5 Plants of rocky slopes; leaves acute to cuspidate
- 6 Plants normally over 1 dm tall, generally woody above base; inflorescence with reduced leaves, bract-like; old stems present the next year. . . . . *G. multiflorum*

- 6 Plants normally less than 1 dm tall, not woody above ground; inflorescence leafy; old stems not present next year. . . . . *G. hypotrichium*  
 4 Plants annual. . . . . *G. bifolium*

***Galium aparine*** L. (Plates 748a, b, c)

CLEAVERS, GOOSE GRASS. Fairly frequent, below 7,500 ft.; riparian; may or may not be introduced. May-Jun. !Lehman Creek T13N R69E S8, \*Baker Creek 739 740E 43 19 290N Clifton 49032.

***Galium bifolium*** S. Wats. (Plates 749a, b)

LOW MOUNTAIN BEDSTRAW. Fairly frequent, 6000-9700 ft.; under pinyon-juniper, open gravelly slopes, open woodlands. May-Jul. !Burnt Mill Canyon T13N R69E S6, \*Timber Creek 738 163E 43 16 254N.

***Galium hypotrichium*** A. Gray

var. *nevadense* (Dempster & Ehrend.) G. Clifton comb. nov. (Plates 750a, b)

NEVADA BEDSTRAW. Limited, 6500-9400 ft.; limestone scabland and slopes. May-Jun. \*†Big Wash 744 079E 43 08 969N Clifton 41043, †branch of Decathon Canyon 738 444E 43 00 206N Clifton 45246.

***Galium multiflorum*** Kell. (Plates 751a, b, c)

MANY-FLOWERED BEDSTRAW. Fairly frequent, 5100-9000 ft.; rocky slopes. May-Jun. \*between Big Wash and Snake Creek T12N R70E S12, †Lexington Arch 742 398E 43 02 886N, †Snake Creek 741 196 43 11 300.

***Galium trifidum*** L.

var. *pacificum* Wieg.

STRAGGLING TRIFID BEDSTRAW. Fairly frequent, below 8,500 ft.; riparian, about springs and meadows. Jul-Aug. !Baker Creek T13N R69E S29, \*Baker Creek 738 710E 43 17 528N Clifton 48840. [*G. t.* var. *subbiflorum* Wieg.].

***Galium triflorum*** Michx (Plates 752a, b)

SWEET-SCENTED BEDSTRAW. Fairly frequent, 6200- 8000 ft.; riparian, mesic woodlands. Jun-Aug. \*Lehman Creek T13N R69E S8.

## SALICACEAE Willow Family

- 1 Flowers subtended by a cup-shaped disk; stamens 6-many; catkins pendulous. . . . . *Populus*  
 1 Flowers subtended by a bract; stamens normally 2, several up to 5; catkins normally erect. . . . . *Salix*

### POPULUS Poplar, Cottonwood, Aspen

- 1 Leaves white on the bottom surface. . . . . *P. alba*  
 1 Leaves greenish on the bottom surface  
 2 Leaf blades rotund-ovate to reniform-cordate. . . . . *P. tremuloides*  
 2 Leaf blades lanceolate to ovate-lanceolate. . . . . *P. angustifolia*

***Populus alba*** L. (Plate 753)

WHITE POPULAR. about old dwelling sites and in towns; introduced from Eurasia. Strawberry Creek T14N R69E S20

***Populus angustifolia*** James (Plate 754)

NARROW-LEAVED COTTONWOOD. Locally frequent, below 7000 ft.; riparian. Jun-Jul. \*Snake Creek T12N R70E S11, Baker Creek T13N R69E S13, North Fork Big Wash 743 061E 43 08 336N, †Snake Creek 752 924E 43 12 116N Clifton 42886

***Populus tremuloides*** Michx. (Plate 755)

QUAKING ASPEN. Frequent, 7000-10,700 ft.; riparian, rocky scree, and rocky slopes. Apr-Jun. !Lehman Creek T13N R69E S8.

### SALIX

- 1 Petiole with glands at the base of leaf blade; large tree. . . . . *S. lasiandra*  
 1 Petiole lacking glands at the base of leaf blade; shrubs  
 2 Main branch leaves normally 5-15 times longer than wide. . . . . *S. exigua*  
 2 Main stem leaves less than 5 times longer than wide  
 3 Leaves dull green on the lower surface. . . . . *S. boothii*  
 3 Lower surface of leaf blade glaucous or hidden by hair  
 4 Twigs red-brown, and twigs of season soft shaggy-hairy. . . . . *S. bebbiana*  
 4 Twigs yellow-gray, smooth. . . . . *S. eriocephala*

**Note:** There are as many opinions as there are persons who work with this group of plants.

***Salix bebbiana*** Sarg. (Plates 756a, b)

BEBB WILLOW. Frequent, below 8500 ft.; along streams. May-Jun. \* Baker Creek 739 186E 43 18 826N, †Baker Creek 11 07 39 168E 43 18 674N, Snake Creek 738 698E 43 11 876N Clifton 45663, Negro Creek 738 587E 43 50 807N (NAD 83) Clifton 47135.

***Salix boothii*** Dorn (Plate 757)

BOOTH'S WILLOW. Frequent, 6000-9000 ft.; riparian along streams. May-Jun. \*Baker Creek 7 38 212E 43 17 425N, †Baker Creek 739 168E 43 18 674N, †Snake Creek 752 924E 43 12 116N.

***Salix eriocephala*** Michx

var. *watsonii* (Bebb) Dorn

YELLOW WILLOW. Widely scattered, 6000-9000 ft.; riparian along streams. May-Jun. †Baker Creek 743 570E 43 20 182 Clifton 43267. [*S. lutea* Nutt.].

***Salix exigua*** Nutt. (Plate 758)

NARROW-LEAVED WILLOW. Fairly frequent, below 8000 ft.; along streams, places where ground water is close to surface. Apr-May. \*†Snake Creek 476 052E 43 10 600N Clifton 41057.

***Salix lasiandra*** Benth.

var. *lasiandra* (Plates 759a, b)

SHINING WILLOW. This large tree has been planted because it is part of a grove of White Poplar. \*Strawberry Creek T14N R69E S20

## SAXIFRAGACEAE Saxifrage Family

- 1 Stamens with fertile anthers 5. . . . . *Heuchera*  
 1 Stamens with fertile anthers 10  
 2 Petals usually lacinate or toothed. . . . . *Lithophragma*  
 2 Petals usually entire. . . . . *Saxifraga*

### HEUCHERA Alum-Root

- 1 Stamens included within the sepals; petals 1-2 mm long; pedicels 1-2 mm long or almost lacking. . . . . *H. parvifolia*  
 1 Stamens exserted beyond the sepals; petals 3-4 mm long; pedicels 2-7 mm long. . . . . *H. rubescens*

***Heuchera parvifolia*** Nutt. (Plate 760)

UTAH LITTLELEAF ALUM-ROOT. Frequent, 6500-11500 ft.; crevices, cliffs, rocky slopes. May-Jul. Gray Cliff T13N R69E S22, \*above Stella Lake T13N R68E S11, !Stella Lake T13N R68E S11, Chalk Spring 738 254E 43 57 820N. [var. *utahensis* (Rydb.) Garrett].

***Heuchera rubescens*** Torr. (Plate 761)

RED ALUM-ROOT, JACK O' THE ROCKS. Frequent, 6500-11,500 ft.; crevices, cliffs, rocky slopes. May-Jul. Gray Cliff T13N R69E S22, \*above Stella Lake T13N R68E S11, †Highland Ridge 734 750E 43 06 771N, !Lehman Creek T13N R69E S8. [var. *pachypoda* Rosendahl, Butters & Lakela].

### LITHOPHRAGMA

- 1 Plants bearing reddish-purple bubbils in the upper leaf and bracts axils; cauline leaves similar to the lower. . . . . *L. glabrum*  
 1 Plants generally lacking bubbils in the upper leaf and bract axils; cauline leaves different than the lower. . . . . *L. tenellum*

***Lithophragma glabrum*** Nutt. (Plates 762a, b)

SMOOTH STAR FLOWER, BULBOUS WOODLAND STAR, ROCK STAR, FRINGECUP. Infrequent, 7000-10500 ft.; grassy places in scrub and woodlands in rich soil. Throughout its range there seems to be several fairly distinct forms. Apr-Aug. !Wheeler Peak Campground T13N R68E S11, \*Stella Lake 732 190E 43 20 670N Clifton 48884.

***Lithophragma tenellum*** Nutt. (Plates 763a, b)

DAINTY STAR, SLENDER WOODLAND STAR, SLENDER FRINGECUP. Infrequent, 5500-9500 ft.; grassy places in scrub and woodlands. May-Jun. South Fork Baker Creek 737 190E 43 16 500N Clifton 48803

**SAXIFRAGA**

- 1 Cauline leaves lacking; plants quite robust. . . . . *S. odontoloma*
- 1 Cauline leaves present; plants small
  - 2 Leaves long petiolate; lacking a basal rosette. . . . . *S. rivularis*
  - 2 Leaves sessile; well developed basal rosette. . . . . *S. ascendens*

***Saxifraga ascendens* L.**

WEDGE-LEAVES SAXIFRAGE. Limited, 11000-11500 ft.; crevices, rocky ledges, under overhanging rocks. The single plant collected was the basal rosette of sterile leaves. Jul-Aug. †Highland Ridge 735 264E 43 06 138N Clifton 42083.

***Saxifraga odontoloma* Piper (Plate 764)**

BROOK SAXIFRAGE. Fairly frequent, 6500-10500 ft.; wet places. Jul-Sep. †Lehman Creek T13N R68E S11, †Baker Creek 734 400E 43 15 450N Clifton 41006, South Fork Big Wash 737 640E 43 05 396N.

***Saxifraga rivularis* L. (Plate 765)**

PYGMY or WEAK SAXIFRAGE. Limited, 10800-11500 ft.; crevices, rocky ledges, under overhanging rocks. Jul-Aug. †Baker Lake 732 780E 43 15 200N Clifton 40982, \*South of Johnson Lake 733 933E 43 12 625N Clifton 43251, Highland Ridge.

**SCROPHULARIACEAE** Figwort Family

**Note:** This family is being played around with by those who claim to know, however they are making it very hard to work with. This author agrees that it is composed of many unlike genera and should be made into several families. What ever family they put these genera into, some others will come along and change them again. It is obvious that *Mimulus* doesn't belong in this family, but it doesn't belong in the Lopseed Family (Phrymaceae). *Mimulus* belongs in its own family. The name sake of the family and *Penstemon* belong together in this family because they both have a sterile 5<sup>th</sup> stamen. *Collinsia* and *Veronica*, as well as others belong in there own family. None of these plants belong in Plantaginaceae.

- 1 Fertile anther-bearing stamens 5. . . . . *Verbascum*
- 1 Fertile anther-bearing stamens 4 or 2
  - 2 Corolla with a staminode (sterile 5th stamen). . . . . *Penstemon*
  - 2 Corolla lacking an obvious staminode
    - 3 Corolla essentially regular, white to pinkish. . . . . *Limosella*
    - 3 Corolla irregular, other colors than white or pinkish
      - 3 Style with 2 distinct stigmatic lobes
        - 4 Anthers all quite well developed; capsules glabrous; calyx cleft much less than half its length in front. . . . . *Mimulus*
        - 4 Anthers with the lower two not as well developed (sometimes almost lacking); capsules glandular pubescent; calyx cleft more than half its length in front. . . . . *Mimetanthe*
  - 3 Style entire or slightly two-lobed
    - 5 Corolla-tube gibbous at the base. . . . . *Collinsia*
    - 5 Corolla-tube uniform at the base . . . . . *Veronica*

**COLLINSIA** Blue-Eyed Mary***Collinsia parviflora* Lindl. (Plate 766)**

SMALL-FLOWERED BLUE-EYED MARY. Frequent, below ft.; moist either shaded or open slopes and flats. Chalk Spring 738 254E 43 57 820N.

**LIMOSELLA** Mudwort

**Note:** The two taxa have some major problems. The photos show the corolla lobes rounded at the apex and the leaves are less than 2 mm wide, which should make these *L. acaulis*, however the plants at the Cedars have stolons which, supposable, only *L. aquatica* should have.

- 1 Petals rounded; plants more or less annual; leaves narrowly linear, upper blade only sometime slightly expanded. *L. acaulis*
- 1 Petals acute; plants perennial with small creeping stolons; upper leaf-blade expanding. . . . . *L. aquatica*

***Limosella acaulis* Sesse & Moc. (Plates 767a, b)**

SOUTHERN MUDWORT. Limited, below 8000 ft.; vernal moist depressions and other wet places. These plants only come

up when it is wet. Jun-early Jul. \*Wheeler Peak Road 738 110E 43 22 760N Clifton 48869.

***Limosella aquatica* L.**

NORTHERN MUDWORT. Infrequent, below 10,000 ft.; muddy margins of streams, often submersed, wet meadows. May-Sep. !Lehman Creek T13N R69E S12 Clifton 11721, †The Cedars 722 325E 43 13 560N †Clifton 52121.

**LINARIA** Toadflax

***Linaria dalmatica* (L.) P. Mill. (Plates 768a, b)**

DALMATIA TOADFLAX. Limited, below 6900 ft.; along roads; introduced from Europe. Late Jun-Jul. Dry Canyon 730 856E 43 62 120N Clifton 51319. [*L. genistifolia* (L.) P. Mill. ssp. *d.* (L.) Maire & Petitm.].

**MIMETANTHE**

***Mimetanthe pilosus* (Benth.) Greene (Plates 769a, b)**

DOWNY MIMETANTHE. Rare, below 7,500 ft.; vernal moist places. May-Aug. \*Lehman Creek 745 152E 43 21 680N Clifton 52153. [*Mimulus p.* (Benth.) S. Wats.].

**MIMULUS** Monkeyflower

- 1 Plants perennial
  - 2 Flowers pink or magenta. . . . . *M. lewisii*
  - 2 Flowers yellow
    - 3 Nodes between the leaves long and obvious; plants not mat forming
      - 4 Corolla-throat closed by the palate; lateral calyx-teeth usually fairly acute and tending to fold inward in fruit
        - 5 Inflorescence composed of more than 5 flowers, if fewer than corolla less than 17 mm long; plants of middle elevations. . . . . *M. guttatus*
        - 5 Inflorescence composed of 5 or few flowers; plants of higher elevations. . . . . *M. tilingii*
      - 4 Corolla-throat ± open; lateral calyx teeth not as acute, most often blunt, not tending to fold inward in fruit
        - . . . . . *M. glabratus*
    - 3 Nodes between the leaves not obvious; plants mat forming. . . . . *M. primuloides*
- 1 Plants annual
  - 6 Calyx ± compressed on the sides, inflated in fruit. . . . . *M. guttatus*
  - 6 Calyx cylindrical, not inflated in fruit, if inflated, not ± compressed
    - 7 Plants viscid-villous, somewhat slimy leaves. . . . . *M. floribundus*
    - 7 Plants glandular-puberulent, not slimy
      - 8 Leaves petiolate. . . . . *M. breviflorus*
      - 8 Leaves sessile
        - 9 Apex of calyx not ciliate. . . . . *M. suksdorfii*
        - 9 Apex of calyx ciliate. . . . . *M. rubellus*

***Mimulus breviflorus* Piper (Pates 770a, b)**

SHORT-FLOWERED MONKEYFLOWER. Fairly rare, 8000-8900 ft.; moist seepage area in an old track, open areas in meadows. This taxon is out of its normal range, both geographically and elevation. Jun. †Grub Gulch 728 262E 43 30 614N Clifton 45204, \*South Fork Baker Creek 737 230E 43 16 660N Clifton 52156.

***Mimulus floribundus* Lindl. (Plates 771a, b, c)**

MANY-FLOWERED MONKEYFLOWER. Infrequent, below 7,500 ft.; moist places. There seem to be two forms, they may be enough different to warrant separate names. May-Sep. !Lehman Creek Clifton 11720, \*Wheeler Peak Road 738110E 4322760N Clifton 48876.

***Mimulus glabratus* Kunth**

UTAH MONKEYFLOWER. Infrequent, below 6500 ft.; wet meadows, lake shores. This taxon is very similar to *M. guttatus* and could be included therein, however if this were to be done than most likely the whole of *M. glabratus* would also have to be included in *M. guttatus*. Jun-Sep. \*†The Cedars 723 809E 43 12 600N Clifton 40946, Pruess Lake T22S R19W S20. [ssp. *utahensis* Pennell, The type came from Pruess Lake near Clay's Ranch].

***Mimulus guttatus* DC. (Plate 772)**

COMMON MONKEYFLOWER. Frequent, below 10000 ft.; springs, streams, wet meadows. Apr-Aug. !Burnt Mill Creek T13N R69E S6, \*Baker Creek 738 850E 43 18 530N Clifton 48806, \*Wheeler Peak Road 738 110E 43 22 760N Clifton 48877.

***Mimulus lewisii*** Purshvar. *lewisii* (Plate 773)

GREAT PURPLE MONKEYFLOWER. Infrequent, 8000-10400 ft.; wet places. These plants have the flowers like the flowers on Mont Hood in Oregon. The flowers are large and uniform in color. The flowers in California are much smaller and not uniform in color. Jun-Aug. †Wheeler Peak Road 733 211E 43 22 300N, †Bald Mountain 733 211 43 22 300, \*Strawberry Creek 732 686E 43 25 828N Clifton 49012.

***Mimulus primuloides*** Benth. (Plates 774a, b)

PRIMROSE MONKEYFLOWER. Fairly frequent, 9400-10100 ft.; wet meadows. Jul-Aug. \*South Fork Baker Creek 737 066E 43 14 893N.

***Mimulus rubellus*** A. Gray (Plates 775a, b)

LITTLE RED-STEMMED MONKEYFLOWER. Infrequent, below 6500 ft.; vernal moist slopes in sand. Often some populations have yellow flowers. May. †The Cedars 723 769E 43 12 662N Clifton 43915, \*Lehman Caves 740 580E 43 21 330N Clifton 51324.

***Mimulus suksdorfii*** A. Gray (Plates 776a, b)

SUKSDORF'S MONKEYFLOWER. Infrequent below 11,300 ft.; vernal moist places. May-Aug. The Cedars 723 769E 43 12 662N Clifton 43828, \*Wheeler Peak Road 738 110E 43 22 760N Clifton 48873, Stella Lake 732 190E 43 20 670N.

***Mimulus tilingii*** Regel (Plates 777a, b, c)

SUBALPINE MONKEY-FLOWER. Locally frequent, 9000-10500 ft.; along streams and about springs. Jul-Aug. \*Baker Creek 734 400E 43 15 450N Clifton 41000, †South of Johnson Lake 734 347E 43 12 412N Clifton 43254

**PENSTEMON**

## 1 Corolla other colors than blue and purples

## 2 Corolla shades of red

3 Inflorescence normally not branching, secund; anthers open at their distal ends. . . . . *P. eatonii*3 Inflorescence normally branching, not secund; anthers closed at their distal ends. . . . . *P. rostriflorus*

## 2 Corolla white; pale pink to lavender-pink, with darker guide lines

4 Corolla 27-35 mm long, abruptly expanding into an inflated throat . . . . . *P. palmeri*4 Corolla 10-16 mm long, not expanding into an inflated throat. . . . . *P. deustus*

## 1 Corolla shades of blue and purple

## 5 Stems pubescent or puberulent

## 6 Corolla glabrous externally

7 Corolla 12-16 mm long; anthers open fully. . . . . *P. watsonii*7 Corolla 25-32 mm long; anthers not opening fully. . . . . *P. speciosus*

## 6 Corolla glandular pubescent externally

8 Herbage with retrorse-appressed, flattened, scale-like hairs. . . . . *P. thompsoniae*

8 Herbage with hairs not flattened and scale-like

9 Calyx at least as long as the tube of the corolla; staminode hairy on most of its inner surface

## 10 Leaves densely hairy

11 Inflorescence axis, peduncles and pedicels not glandular . . . . . *P. dolius*11 Inflorescence axis, peduncles and pedicels glandular. . . . . *P. barnebyi*10 Leaves glabrous to very sparsely hairy; basal leaves linear to narrowly lanceolate. . . . . *P. concinnus*9 Calyx shorter than the corolla tube; staminode hairy at the apex. . . . . *P. humilis*

## 5 Stems glabrous

12 Corollas glandular-pubescent, some late flowers remotely so; anthers not open at the connective. . . . . *P. leiophyllus*

12 Corollas glabrous; anther open at the connective, if not, then not open at the distal ends (horseshoe-shaped)

13 Corolla 25-32 mm long; anthers not open along the connective; anthers long hairy. . . . . *P. moriahensis*

13 Corolla 14-20 (23) mm long; anthers divaricate, open from one end to the other; anther glabrous

14 Staminode glabrous. . . . . *P. confusus*

14 Staminode bearded

15 Plants of gravelly slopes, pinyon belt and higher; beard of staminode 1-2 mm long and tangled . . . *P. pachyphyllus*

15 Plants of sandy or sandy-loam slopes and flats, below pinyon belt; beard of staminode ± 1 mm long, not

tangled. . . . . *P. immanifestus****Penstemon barnebyi*** N. Holmgren (Plates 778a, b)

BARNEBY'S PENSTEMON. Infrequent, below 8200 ft.; alluvial gravels and silt derived from limestone. May-Jun. †The Troughs 738 545E 42 79 185N Clifton 43881.

***Penstemon concinnus*** Keck (Plates 779a, b)

ELEGANT PENSTEMON. Infrequent, 5800-7400 ft.; gravelly alluvial soils associated with pinyon-juniper woodland. May-Jun. \*South Fork Lexington T11N R69E S1, Big Wash Road 7200 ft., †Snake Creek 748 552E 43 11 718N

***Penstemon confusus*** M.E. Jones (Plate 780)

MISTAKEN PENSTEMON. Infrequent, 5500-7200 ft.; dry, gravelly soils (often limestone). Apr-Jun. \*Snake Creek Cave T12N R70E S13.

***Penstemon deustus*** Lindl.

var. *pedicellatus* M. E. Jones (Plates 781a, b)

NARROW-LEAVED HOT-ROCK BEARDTONGUE. Infrequent, 7000-9000 ft.; brushy slopes. Jun- early Jul. †Box Canyon 730 769E 43 09 576N Clifton 45292, Dry Canyon 731 930E 43 62 040N Clifton 51318

***Penstemon dolius*** Pennell

var. *dolius* (Plates 782a, b, c)

JONES' PENSTEMON. Infrequent, below 7000 ft.; dry, gravelly, sandy or clay, often alkaline soils. May-Jun. \*Baker Creek T13N R69E S14, !Baker Creek 743 427E 43 20 271N, †Branch of Weaver Creek 736 272E 43 32 278N Clifton 44005.

***Penstemon eatonii*** A. Gray

var. *eatonii* (Plates 783a, b)

EATON or FIRECRACKER PENSTEMON. Frequent, below 9600 ft. May-Jul. !Burnt Mill Canyon 39° 01' 45" 114° 15' 40", Mount Washington Road T12N R68E S22.

***Penstemon humilis*** A. Gray

var. *humilis* (Plate 784)

LOW PENSTEMON. Infrequent, 6000-11000 ft.; rocky openings in subalpine forest. These plants are more like variety *brevifolius* from the Wasatch Range in Utah. The non flowering vegetative stems have the leaves glabrous. The basal leaves of the flowering stem are hairy. The plants also appear to have short rhizomes. The calyx lobes are attenuate. These plants don't even remotely look like the plants from N. W. Nevada. June-Jul. \*head of Lincoln Canyon T12N R68E S14, †Mt. Washington Road 732 545E 43 08 949N, !Wheeler Peak Road 734 806E 43 22 918N, Highway 50 725 143E 43 38 983N Clifton 44010, South Fork Big Wash 737 5309E 43 05 922N, Chalk Spring 738 254E 43 57 820N.

***Penstemon immanifestus*** N. Holmgren (Plates 785a, b, c)

STEPTOE VALLEY PENSTEMON. Infrequent, 5000-6000 ft.; valley floors in sandy soil. Late May-Jun. †Hamlin Valley 751 700E 42 87 587N Clifton 43890.

***Penstemon leiophyllus*** Pennell

var. *francisci-pennellii* (Crosswh.) N. Holmgren (Plates 786a, b)

WHEELER PEAK PENSTEMON. Frequent, 8000-11000 ft.; rocky openings in forests. Type from above Theresa Lake. Jun-Sep. !Baker Lake 732 964E 43 15 377N, Wheeler Peak Campground T13N R68E S11, !Lehman Creek T13N R69E S8, †Mt. Washington Road 11 07 32 545E 43 08 949N, \*South Fork Baker Creek 738 076E 43 17 1082 Clifton 48845, †Mill Creek 736 140E 43 23 766N Clifton 48886.

***Penstemon moriahsensis*** N. Holmgren (Plates 787a, b)

MOUNT MORIAH PENSTEMON. Infrequent, 8200-9000 ft., mostly North Snake Range; rocky slopes in pinyon-juniper woodland. The only difference between this taxon and *P. speciosus* is that the anthers are long hairy. This author is going to be arbitrary and call all plants that have long hairs on the anthers this taxon, which means that the plants in the Silver Peak Range are also this taxon. Jun-Jul. Chalk Spring 738 254E 43 57 820N Clifton 47270, West of Mud Spring 734 750E 43 55 880N (NAD 83) Clifton 47187, \*Pole Canyon 739 593E 43 14 352N, Clifton 43238, \*Dry Canyon 733 135E 43 61 525N Clifton 48900.

***Penstemon pachyphyllus*** Rydb.

var. *congestus* (M.E. Jones) N. Holmgren (Plates 788a, b)

THICK LEAF PENSTEMON. Frequent, 6000-10700 ft.: gravelly slopes in pinyon-juniper. Late May-early Jul. !Osceola Road T14N R68E S7, North Fork Big Wash 742 138E 43 08 689N, †Big Wash Peak 738 380E 43 06 794N Clifton 45257.

***Penstemon palmeri*** A. Gray

var. *palmeri* (Plate 789)

PALMER'S PENSTEMON. Locally frequent, below 8000 ft.; open places, often in canyons. May-Aug. !Lehman Caves T13N R69E S10, \*Snake Creek 747 865E 43 11 450N Clifton 48826.

***Penstemon rostriflorus*** Kell. (Plates 790a, b)

BEAKED PENSTEMON. Frequent, 6500-10000 ft.; rocky slopes. Jun-Aug. !Baker Creek T13N R69E S22, Wheeler Peak Road T13N R68E S36, North Fork Big Wash 743 061E 43 08 336N.

***Penstemon speciosus*** Lindl.

SHOWY BEARDTONGUE. Infrequent, above 7500 ft.; dry slopes and sandy flats. May-Jul. \*†Rye Grass Canyon 734 775E 4 361 540N Clifton 48911

***Penstemon thompsoniae*** (A. Gray) Rydb.var. *thompsoniae* (Plates 791 a, b)

THOMPSON'S PENSTEMON. Limited, 6000-7500 ft.; open, clays or sandy soil derived from limestone. May-Jun. \*Red Ledges 735 800E 42 83 940N Clifton 45151

***Penstemon watsonii*** A. Gray (Plates 792a, b)

WATSON'S PENSTEMON. Frequent, 6400-10700 ft.; gravelly to rocky places, opening in upper mountain forest. Jun-early Aug. \*Snake Creek T12N R69E S6, Chalk Spring 738 254E 43 57 820N.

**VERBASCUM*****Verbascum thapsus*** L. (Plates 793a, b)

WOOLLY MULLEIN. Fairly frequent, below 10400 ft.; disturbed places; introduced from Eurasia. Jun-Sep. !Lehman Creek T13N R69E S9, \*Snake Creek 753500E 4312280N Clifton 48824.

**VERONICA**

- 1 Plants annual, tap-rooted or with several roots
- 2 Style very short; lobes of fruit shallow; flowers whitish. . . . . *V. peregrina*
- 2 Style fairly long; lobes of fruit deep; flowers blue. . . . . *V. biloba*
- 1 Plants perennial, rhizomatous
- 3 Inflorescence having axillary racemes
- 4 Upper leaves clasping; corolla 5-10 mm wide
- 5 Corolla 5-10 mm across, blue, pale violet with purplish guidelines. . . . . *V. anagallis-aquatica*
- 5 Corolla 3-5 mm across, white to pink or pale bluish. . . . . *V. catenata*
- 4 Upper leaves petiolate; corolla 7-10 mm wide. . . . . *V. americana*
- 3 Inflorescence spicate, lacking axillary racemes. . . . . *V. serpyllifolia* var. *humifusa*

***Veronica americana*** (Raf.) Schwein (Plate 794)

AMERICAN BROOKLIME. Frequent, below 10400 ft.; wet places. May-Sep. !Baker Creek T13N R69E S29, †Wheeler Peak Road 733 211E 43 22 300N.

***Veronica anagallis-aquatica*** L. (Plates 795a, b)

WATER SPEEDWELL. below 8000 ft. May-Sep. !Willow Patch Spring T15N R68E S36.

***Veronica biloba*** L. (Plate 796)

BILOBED SPEEDWELL. Infrequent, below 8400 ft.; disturbed places; introduced from w. Asia. May-early Jun. \*Baker Creek 738 756E 43 17 586N, †Dry Canyon 733135E 4361525N Clifton 48897.

***Veronica catenata*** Pennell (Plate 797)

PALE-FLOWERED or BROAD-FRUITED SPEEDWELL. Limited, below 5800 ft.; wet places; said to be introduced from Europe Jul-Sep. The Cedars T12N R67E S2, †Lake Creek 760 026E 43 06 776N Clifton 41065.

***Veronica peregrina*** L.var. *xalapensis* (H. B. K.) St. John & Warren (Plates 798a, b)

PURSLANE SPEEDWELL. Fairly frequent, below 9600 ft.; vernal moist places. May-Sep. \*Dead Lake T12N R68E S6, The Cedars T12N R67E S2, Strawberry Creek T14N R68E S24, !Burnt Mill Canyon T13N R69E S6.

***Veronica serpyllifolia*** L.var. *humifusa* (Dickson) Syme (Plate 799)

THYME LEAF SPEEDWELL. Frequent, below 10400 ft.; moist places, drying streams. May-Jul. Lehman Creek T13N R69E S8, \*Wheeler Peak Campground 733 174E 43 21 109N, !Burnt Mill Canyon T13N R69E S6.

**SOLANACEAE** Nightshade Family

- 1 Flowers long tubular. . . . . *Nicotiana*
- 1 Flowers lacking a long tube
- 2 Corolla white, milk-white, greenish white or purplish. . . . . *Solanum*
- 2 Corolla yellowish. . . . . *Physalis*

## NICOTIANA

*Nicotiana attenuata* Torr. (Plates 800a, b)

COYOTE TOBACCO. Infrequent, below 7500 ft.; along roads and other disturbed places, washes. Jun-Oct. \*South Highland Road T11N R67E S34, Lehman Caves 741 011E 43 20 718N.

## PHYSALIS Ground-Cherry

*Physalis hederifolia* A. Gray (Plates 801a, b)

IVY-LEAVED GROUND-CHERRY. Limited, 5400-6000 ft.; dry, open places. These plants have a mixture of simple and branched hairs that are all mostly multicellular. Variety *fendleri* has no multicellular hairs. May-Jun. \*Snake Creek 753 800E 43 11 828N Clifton 43992.

## SOLANUM Nightshade

- 1 Plants perennial, often climbing; flowers purplish. . . . . *S. dulcamara*
- 1 Plants annual, not climbing; flowers not purplish
- 2 Leaves deeply lobed. . . . . *S. triflorum*
- 2 Leaves subentire to regularly and deeply sinuate-dentate. . . . . *S. physalifolium*

*Solanum dulcamara* L. (Plate 802)

CLIMBING NIGHTSHADE. Limited, about 4500 ft.; pond margins or along streams in ranch land; introduced from north Eurasia. Jun-early Sep. \*Lehman Creek, Baker Ranch 750 025E 43 22 005N Clifton 48851.

*Solanum physalifolium* Rusby (Plate 803)

GROUND-CHERRY NIGHTSHADE. Limited, about 5920 ft.; waste places. This native plant generally acts as a weed. May-Aug. †Lehman Creek 745 280E 43 21 267N. [*S. sarrachoides* Sendtner, misapplied].

*Solanum triflorum* Nutt. (Plate 804)

THREE-FLOWERED NIGHTSHADE. Widely scattered, below 6500 ft.; along road margins; introduced from South America. Jun-Sep. \*Highway 894 T13N R67E S15, Spring Valley T10N R70E S15.

## TAMARICACEAE Tamarisk Family

### TAMARIX

*Tamarix ramosissima* Ledeb. (Plates 805a, b)

BRANCHED SALT CEDAR. Widely scattered, below 6200 ft.; along slow moving streams and in chenopod scrub; introduced from e. Asia. Jul-Mid Aug. Baker Creek T13N R69E S13, \*Lake Creek 760029E 4306700N Clifton 49026.

## ULMACEAE Elm Family

### ULMUS

*Ulmus pumila* L. (Plates 806a, b, c)

SIBERIAN ELM; CHINESE ELM. Limited to old home sites and about towns; introduced from e. Asia \*Baker T13N R70E S9.

## URTICACEAE

### URTICA

*Urtica dioica* L. (Plates 807a, b)

HOARY NETTLE. Infrequent, below 7000 ft., moist to wet places. The varieties are subject to interpretation and matters of opinion. There are trends in this taxon for out in the field there are obvious differences, but they don't seem to be consistent. Most of the plants that are found within this area are fairly pubescent, but not gray. The stinging hairs are not very thick. \*Rest Area T15N R68E S35. [var. *angustifolia* Schlecht., var. *gracilis* var. *holosericea* (Nutt.) C. L. Hitchc., var. *occidentalis* S. Wats.].

## VALERIANACEAE

## VALERIANA

*Valeriana acutiloba* Rydb.var. *pubicarpa* ((Rydb.) Cronq. (Plates 808a, b, c)

Fairly frequent, 8500-10000 ft., North Snake Range; sagebrush and open forest floors. Mid Jun-Aug. †Big Canyon 740 030E 43 52 845N (NAD 83) Clifton 47143, \*Big Canyon 740 530E 43 53 830N Clifton 52124.

## VERBENACEAE

## VERBENA

*Verbena bracteata* Lag. & Rodr. (Plates 809a, b)

BRACKETED VERVAIN. Fairly frequent, below 7500 ft.; mostly on fine gravel on road margins. May-Sep. \*Highway 894 T13N R67E S15, †Baker Creek Road 741 536E 43 20 121N.

## VIOLACEAE

## VIOLA

- 1 Flowers yellow at least on the face  
 2 Basal leaf blade 1.5-6 times longer than wide. . . . . *V. praemorsa*  
 2 Basal leaf blade 1-1.5 times longer than wide  
 3 The leaves crenate-sinuate to shallowly lobed . . . . . *V. purpurea*  
 3 The leaves shallowly crenate. . . . . *V. utahensis*  
 1 Flowers shades of blue to white. . . . . *V. nephrophylla*

*Viola nephrophylla* Greene (Plates 810a, b)NORTHERN MEADOW VIOLET. Infrequent, 6000-8500 ft.; along streams, seeps. Some of the plants in this area that have past for this species apparently are quite a bit different in that the flowers are way down inside the leaves, the stipules have gland-tipped hairs and the plants have no rhizomes. This description doesn't fit any known taxon. Jun-Jul. Timber Creek 738 626 43 17 108, †Baker Creek 739 184E 43 18 826N, †Shingle Creek 729 200E 43 20 536N Clifton 45683. [*Viola nephrophylla* Greene, ssp. *affinis* (LeConte) R. J. Little].*Viola praemorsa* Douglas.var. *linguifolia* (Nutt.) Peck (Plates 811a, b)UPLAND YELLOW VIOLET. Infrequent, 6000-10000 ft.; cool shaded woods, often in canyons. May-Jun. \*Snake Creek T12N R69E S13, †Decathon Canyon 737 148E 43 03 585N Clifton 45239. [var. *altior* Blank.]*Viola purpurea* Kell.var. *venosa* (S. Wats.) Brain. (Plates 812a, b)

MOUNTAIN VIOLET. Infrequent, 7000-10400 ft. wooded or brush cover slopes. May-Jun. South Fork Baker Creek 737 190E 43 16 215N Clifton 48802. [ssp. v. (S. Wats.) Baker &amp; Clausen].

*Viola utahensis* M. S. Baker & Clausen

UTAH VIOLET. Infrequent, 6000-9500 ft.; slopes in sagebrush and pinyon-juniper woodland. May-Jun. †Murphy Wash 734 794E 42 96 424N Clifton 43959, \*Lehman Creek 737160E 4321630N Clifton 48973.

## VISCACEAE Christmas Mistletoe Family

**Note:** As always, molecular work has struck again, all the plants below, except *A. douglasii* have been lumped back into *A. campylopodum*. *A. cyanocarpum* is markedly different and so are some of the others. *A. divaricatum* has a number of growth forms that seem to be different. So this author is going to leave them as they were.

- 1 Flowers on short, recurved pedicels; plants on White Fir, Douglas-fir, and pines. . . . . *Arceuthobium*  
 1 Flowers sunken into axis; plants on junipers. . . . . *Phoradendron*

**ARCEUTHOBIUM** Dwarf Mistletoe

- 1 Staminate buds subglobose; plants usually on Douglas-fir, rarely on Picea..... *A. douglasii*  
 1 Staminate buds lenticular; on other conifers  
 2 Plants normally 2-4 (5) cm long; on Limber pine, rarely on Bristle-cone pine. .... *A. cyanocarpum*  
 2 Plants normally 5-15 cm long; on White fir or Pinyon pine  
 3 Stems yellow to yellow-green; on white fir. .... *A. abietinum*  
 3 Stems olive-green to brown; on pinyon pine. .... *A. divaricatum*

*Arceuthobium abietinum* (Engelm.) Hawksw. & Wiens

FIR DWARF MISTLETOE. Limited. 7000-9200 ft.; on White Fir. This is the first known collection north of the Charleston Mountains. Aug.-Sept. \*branch of Lincoln Canyon T12N R68E S27, †Branch of North Fork Big Wash 736 300E 43 08 00N Clifton 44536.

*Arceuthobium cyanocarpum* (Rydb.) A. Nels. (Plate 813)

LIMBER PINE DWARF MISTLETOE. Infrequent, 9000-11000 ft.; on Limber pine. Aug. \*†Mt. Washington Road 731 727E 43 07 791N, Bake Creek 735 153E 43 16 460N.

*Arceuthobium divaricatum* Engelm. (Plate 814)

PINYON DWARF MISTLETOE. Frequent, 6000-7500 ft.; on Pinyon Pine. Aug.-Sep. \*Big Wash T12N R70E S27.

*Arceuthobium douglasii* Engelm. (Plate 815)

DOUGLAS-FIR DWARF MISTLETOE. Widely scattered, 8000-9500 ft.; on Douglas Fir. Only know in Nevada from this range. Mar-Apr (May). \*Wheeler Peak Road T13N R69E S6.

**PHORADENDRON** Mistletoe*Phoradendron juniperinum* A. Gray (Plates 816a, b)

JUNIPER MISTLETOE. Fairly frequent, below 7500 ft.; slopes and flats. May-Jul. \*Baker Creek Road 741 305E 43 19 491N.

**ZYGOPHYLLACEAE** Caltrop Family**TRIBULUS***Tribulus terrestris* L. (Plates 817a, b)

PUNCTURE VINE, CALTROP. Infrequent, below 6000 ft.; along roads; introduced from the Mediterranean. May-Sep. !Baker T13N R70E S9.

Plates 635-639b



Plate 635 *Bistorta bistortoides*



Plate 636a *Eriogonum* 'alluvium'



Plate 636b



Plate 636c



Plate 637a *Eriogonum* 'arenosum'



Plate 637b



Plate 637c



Plate 638b



Plate 638a *Eriogonum caespitosum*



Plate 639a *Eriogonum cernuum*



Plate 639b

Plates 640-643b



Plate 640 *Eriogonum darrovii*



Plate 641a *Eriogonum deflexum* var. *nevadense*



Plate 641c



Plate 642a *Eriogonum holmgrenii*



Plate 641b



Plate 642b



Plate 643a *Eriogonum hookeri*



Plate 643b

Plates 643c-647a



Plate 643c



Plate 644a *Eriogonum howellianum*



Plate 644b



Plate 645a *Eriogonum* 'innovatum



Plate 645b



Plate 646b



Plate 646a *Eriogonum microthecum* dwarf



Plate 647a *Eriogonum microthecum* var. *laxiflorum*

Plates 647b-651



Plate 647b



Plate 648a *Eriogonum microthecum* var. *simpsonii*



Plate 648b

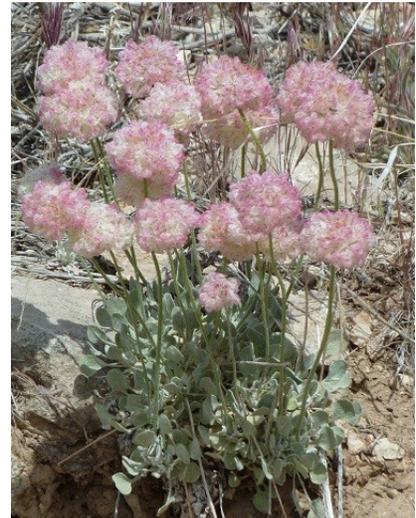


Plate 649a *Eriogonum ovalifolium*



Plate 648c



Plate 650b



Plate 649b



Plate 650a *Eriogonum palmerianum*



Plate 651 *Eriogonum racemosum*

Plates 652a-655



Plate 652a *Eriogonum shockleyi*



Plate 652b



Plate 653a *Eriogonum umbellatum*  
var. *aureum*



Plate 653b



Plate 654b



Plate 654a *Eriogonum umbellatum* var. *dichrocephalum*



Plate 655 *Eriogonum umbellatum* var. *juniporinum*

Plates 656-659b



Plate 656 *Eriogonum umbellatum* var. *subaridum*



Plate 657a *Eriogonum villiformum*



Plate 657b



Plate 658 *Oxyria digyna*



Plate 659a *Persicaria amphibia*



Plate 659b

Plates 660a-666b



Plate 660a *Persicaria lapathifolia*



Plate 660b



Plate 661a *Polygonum argyrocoleon*



Plate 662  
*Polygonum douglasii*



Plate 661b



Plate 663b



Plate 663a *Polygonum aviculare*



Plate 664a  
*Polygonum douglasii* var.  
*johnstonii*



Plate 664b



Plate 666b



Plate 665 *Polygonum kelloggii*



Plate 666a *Polygonum* 'terra-sterilis'

Plates 667a-672a



Plate 667a *Rumex acetosella*



Plate 667b



Plate 668a *Rumex crispus*



Plate 668b



Plate 669 *Rumex salicifolius* var. *triangulivalvis*



Plate 670a *Claytonia perfoliata*



Plate 671 *Crunocallis chamissoi*



Plate 670b



Plate 672a *Lewisia pygmaea*

Plates 672b-676



Plate 672b

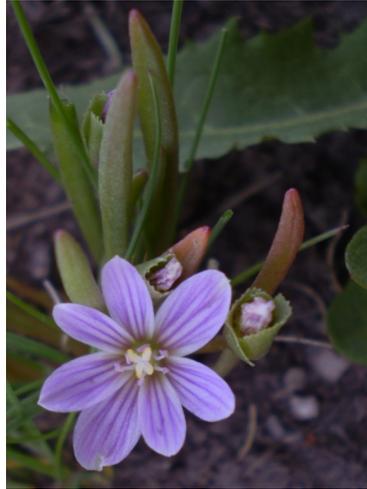


Plate 672c



Plate 673a *Lewisia rediviva*



Plate 673b



Plate 674a *Androsace septentrionalis*



Plate 674b



Plate 675 *Dodecatheon alpinum*



Plate 676 *Dodecatheon pulchellum*

Plates 677-680b



Plate 677 *Primula cusickiana* var. *nevadensis*



Plate 678 *Primula parryi*



Plate 679a *Pyrola asarifolia*



Plate 679b



Plate 680a *Pyrola chlorantha*



Plate 680b

Plates 681a-686a



Plate 681a *Pyrola minor*



Plate 681b



Plate 682a *Actaea rubra*



Plate 682b



Plate 683a *Ceratocephala testiculata*



Plate 683b



Plate 684a *Clematis ligusticifolia*



Plate 685a *Myosurus apetalus* var. *montanus*



Plate 685b



Plate 686a *Myosurus mimimus*



Plate 684b

Plates 686b-691



Plate 686b



Plate 687a *Ranunculus adoneus*



Plate 687b



Plate 688 *Ranunculus alismifolius*  
var. *montanus*



Plate 689a *Ranunculus andersonii*



Plate 689a



Plate 690b



Plate 690a *Ranunculus aquatilis* var. *capillaceus*



Plate 691 *Ranunculus cymbalaria*

Plates 692a-696a



Plate 692a *Ranunculus eschscholtzii*  
var. *oxynotus*



Plate 692b



Plate 693b



Plate 693a *Ranunculus glaberrimus* var. *ellipticus*



Plate 693c



Plate 694b



Plate 694a *Ranunculus inamoenus*



Plate 695a *Ranunculus macounii*



Plate 695b



Plate 696a *Ranunculus sceleratus*  
var. *multifidus*

Plates 696b-701b



Plate 696b



Plate 696c



Plate 697a *Ranunculus* 'serpentine'



Plate 697b



Plate 698b



Plate 698a *Thalictrum alpinum*



Plate 699b



Plate 699a *Thalictrum fendleri*



Plate 699c



Plate 701a *Castilleja applegatei* var. *pinetorum*



Plate 700 *Ceanothus martinii*



Plate 701b

Plates 702a-705b



Plate 702a *Castilleja chromosa*



Plate 702b



Plate 702c



Plate 703a *Castilleja dissitiflora*



Plate 703b



Plate 705a *Castilleja miniata*



Plate 704a *Castilleja lineariifolia*



Plate 704b



Plate 705b

Plates 706-710b



Plate 706 *Castilleja minor*



Plate 707a *Castilleja nana*



Plate 707b



Plate 707c



Plate 708a *Castilleja scabrida* var. *barnebyana*



Plate 708b



Plate 709a *Castilleja* 'serpentina'



Plate 709b



Plate 710a *Cordylanthus kingii*



Plate 710b

Plates 711a-714b



Plate 711a *Cordylanthus parviflorus*



Plate 711b



Plate 712a *Cordylanthus ramosus*



Plate 713a *Pedicularis centranthera*



Plate 712b



Plate 714a *Amelanchier alnifolia*



Plate 713b



Plate 714b

Plates 714c-718a



Plate 714c



Plate 714d



Plate 715a *Cercocarpus intricatus*



Plate 715b



Plate 7116a, b *Cercocarpus ledifolius* var. *intermontanus*



Plate 717b



Plate 718a *Geum macrophyllum*



Plate 717a *Chamaebatiaria millefolium*

Plates 718b-722b



Plate 718b



Plate 719a *Geum rossii* var. *turbinatum*



Plate 719b



Plate 720a *Holodiscus dumosa*



Plate 720b



Plate 721a *Ivesia kingii*



Plate 721b



Plate 722a *Pentaphylloides fruticosa*



Plate 722b

Plates 723a-727b



Plate 723a *Peraphyllum ramosissimum*



Plate 723b



Plate 724a *Petrophytum caespitosum*



Plate 724b



Plate 725 *Physocarpus alternans*



Plate 727b



Plate 726 *Potentilla anserina*



Plate 727a *Potentilla biennis*

Plates 728a-732b



Plate 728a *Potentilla concinna*



Plate 728b



Plate 730a *Potentilla glaucophylla*



Plate 729a, b *Potentilla glandulosa* var. *pseudorupestris*



Plate 730b



Plate 730c



Plate 731a, b *Potentilla gracilis* deep toothed forms



Plate 731c



Plate 732a, b *Potentilla gracilis* shallow toothed forms

Plates 732c-735c



Plate 732c, d *Potentilla gracilis* shallow toothed forms



Plate 734b



733a, b *Potentilla gracilis* in between



Plate 734c



Plate 734a *Potentilla holmgrenii*



Plate 735a *Potentilla multisecta*



Plate 735b



Plate 735c

Plates 736a-739b



Plate 736b



Plate 736a *Potentilla norvegica* var. *hirsuta*



Plate 737a *Potentilla ovina*  
var. *decurrens*



Plate 737b



Plate 738a *Potentilla ovina*



Plate 738b



Plate 739b



Plate 739 *Potentilla pennsylvanica*

Plates 740a-744b



Plate 740a *Potentilla rubricaulis*



Plate 740b



Plate 742a *Purshia stansburiana*



Plate 741a *Prunus virginiana* var. *demissa*



Plate 741b



Plate 742b



Plate 743a *Purshia tridentata*



Plate 744a *Rosa woodsii*



Plate 744b



Plate 743b

Plates 745a-749a



Plate 745a *Rubus idaeus* var. *strigosus*



Plate 745b



Plate 746a *Sibbaldia procumbens*



Plate 746b



Plate 747a *Sieversia triflora*



Plate 747b



Plate 747c



Plate 748a *Galium aparine*



Plate 748b



Plate 748c



Plate 749a *Galium bifolium*

Plates 749b-752b



Plate 749b



Plate 750a *Galium hypotrichium* var. *nevadense*



Plate 750b



Plate 751a *Galium multiflorum*



Plate 751b



Plate 751c



Plate 752a *Galium triflorum*



Plate 752b

Plates 753-758



Plate 753 *Populus alba*



Plate 754 *Populus angustifolia*



Plate 755 *Populus tremuloides*



Plate 756a *Salix bebbiana*



Plate 756b



Plate 757 *Salix boothii*



Plate 758 *Salix exigua*

Plates 758a-763b



Plate 759a *Salix lasiandra*



Plate 760 *Heuchera parvifolia*



Plate 761 *Heuchera rubescens*



Plate 759b



Plate 763a *Lithophragma tenellum*



Plate 762a *Lithophragma glabrum*



Plate 762b



Plate 763b

Plates 764-770a



Plate 764 *Saxifraga odontoloma*



Plate 765 *Saxifraga rivularis*



Plate 766a *Collinsia parviflora*



Plate 766b



Plate 767a *Limosella acaulis*



Plate 767b



Plate 768a *Linaria dalmatica*



Plate 768b

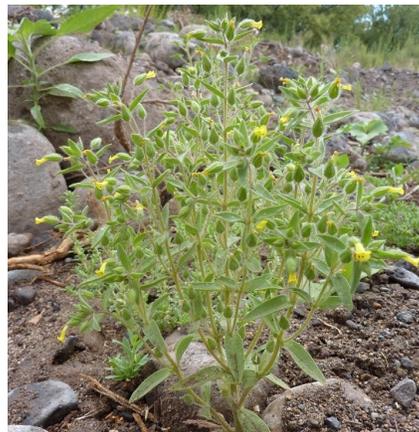


Plate 769a *Mimetanthe pilosus*



Plate 769b



Plate 770a  
*Mimulus  
breviflorus*

Plates 770b-777a



Plate 770b



Plate 771a *Mimulus floribundus*



Plate 771b



Plate 771c



Plate 772 *Mimulus guttatus*



Plate 773 *Mimulus lewisii*



Plate 774b



Plate 774a *Mimulus primuloides*



Plate 775a *Mimulus rubellus*



Plate 775b



Plate 777a *Mimulus tilingii*



Plate 776b



Plate 776a *Mimulus suksdorfii*

Plates 777b-781a



Plate 777b



Plate 777c



Plate 778b



Plate 778a *Penstemon barnebyi*



Plate 779a *Penstemon concinnus*



Plate 779b



Plate 780 *Penstemon confusus*



Plate 781a *Penstemon deustus* var. *pedicellatus*

Plates 781b-785a



Plate 781b



Plate 782a *Penstemon dolius*



Plate 782b



Plate 783b



Plate 782c



Plate 783a *Penstemon eatonii*



Plate 784 *Penstemon humilis*



Plate 785a *Penstemon immanifestus*

Plates 784b-788



Plate 785b



Plate 785c



Plate 786b



Plate 786a *Penstemon leiophyllus* var. *francisci-pennellii*



Plate 788a *Penstemon pachyphyllus*  
var. *congesta*



Plate 787a *Penstemon moriahensis*



Plate 787b



Plate 789 *Penstemon palmeri*



Plate 788b

Plates 790a-794



Plate 790a *Penstemon rostriflorus*



Plate 790b



Plate 791a *Penstemon thompsoniae*



Plate 791b



Plate 792b



Plate 792a *Penstemon watsonii*



Plate 793b



Plate 793a *Verbascum thapsus*



Plate 794 *Veronica americana*

Plates 795a-801b



Plate 795a *Veronica anagallis-aquatica*



Plate 795b



Plate 796 *Veronica biloba*



Plate 797 *Veronica catenata*



Plate 798a, b *Veronica peregrine* var. *xalapensis*



Plate 799 *Veronica serpyllifolia*  
var. *humifusa*



Plate 800a *Nicotiana attenuata*



Plate 800b



Plate 801a *Physalis hederifolia* var. *palmeri*



Plate 801b

Plates 802-807b



Plate 802 *Solanum dulcamara*



Plate 803 *Solanum physalifolium*



Plate 804 *Solanum triflorum*



Plate 805 *Tamarix ramosissima*



Plate 805b



Plate 806a *Ulmus pumila*



Plate 806b



Plate 806c



Plate 807a *Urtica dioica*



Plate 807b

Plates 808a-810b



Plate 808a *Valeriana acutiloba* var. *pubicarpa*



Plate 808b



Plate 808c



Plate 809a *Verbena bracteata*



Plate 809b



Plate 810a *Viola nephrophyllum*



Plate 810b

Plates 811a-814



Plate 811a *Viola praemorsa* var. *linguifolia*



Plate 811b



Plate 812a *Viola purpurea* var. *venosa*



Plate 812b



Plate 813 *Arceuthobium cyanocarpum*



Plate 814 *Arceuthobium divaricatum*

Plates 814-817b



Plate 815 *Arceuthobium douglasii*



Plate 816a *Phoradendron juniperinum*



Plate 816b



Plate 817a *Tribulus terrestris*



Plate 817b

## MONOCOTS

- 1 Plants free floating, thallus-like. . . . . **Lemnaceae**
- 1 Plants not as above
  - 2 Inflorescence with 1000+ flowers in a single dense spike; plants normally 15-40 dm tall. . . . . **Typhaceae**
  - 2 Inflorescence with way fewer flowers than a 1000; plants seldom over 15 dm, if over 15 dm tall, flowers not in a single dense spike
    - 3 Plants essentially under water (ours)
      - 4 Leaves opposite; flowers axillary. . . . . **Zannichelliaceae**
      - 4 Leaves opposite; flowers in spikes. . . . . **Potamogetonaceae**
    - 3 Plants not all under water
      - 5 Flowers with an obvious petaloid appearance
        - 6 Flowers irregular. . . . . **Orchidaceae**
        - 6 Flowers regular
          - 7 Flowers with shades of blue. . . . . **Iridaceae**
          - 7 Flowers other colors than blue
            - 8 Plants growing in water of ponds. . . . . **Alismataceae**
            - 8 Plants growing out of water on moist to dry land. . . . . The Lily Families
      - 5 Flowers lacking an obvious petaloid appearance
        - 9 Flowers in dense ball-like clusters, the staminate above the pistillate. . . . . **Sparganiaceae**
        - 9 Flowers not as above
          - 10 Flowers lacking perianth segments as such
            - 11 Stems lacking nodes; anthers base-fixed. . . . . **Cyperaceae**
            - 11 Stems with the nodes easily found; anthers versatile. . . . . **Poaceae**
          - 10 Flowers having perianth segments
            - 12 Plants with the inflorescence an elongated spike that is well exserted above the leaves. . . . . **Juncaginaceae**
            - 12 Plants not as above
              - 13 Flowers of a single kind, none in the basal sheaths. . . . . **Juncaceae**
              - 13 Flowers variously oriented, single pistillate flowers in the sheathing basal leaf axils or in short spikes. **Lilaeaceae**

## THE LILY FAMILIES (suggested)

- 1 Leaves with a thick ivory-colored spine. . . . . **Agavaceae**
- 1 Leaves otherwise
  - 2 Flowers in umbels. . . . . **Alliaceae**
  - 2 Flowers not in umbels
    - 3 Flowers 1-4 per plant. . . . . **Liliaceae**
    - 3 Flowers greater than 4
      - 4 Leaves grass-like. . . . . **Melanthiaceae**
      - 4 Leaves broad. . . . . **Ruscaceae**

**AGAVACEAE** Agave Family

## YUCCA

*Yucca harrimaniae* Trel. (Plates 851a, b)

HARRIMAN'S YUCCA. Infrequent, 5400-6800 ft.; gravelly limestone slopes. May-June. \*†Hamlin Valley 749 530E 42 90 430N Clifton 45156.

**ALLIACEAE** Onion Family

## ALLIUM Onion

- 1 Leaf 1 per stem
  - 2 Flowers white to pinkish white. . . . . **A. nevadense**
  - 2 Flowers dark red. . . . . **A. atrorubens**

- 1 Leaves more than 1 per stem  
 3 Inner perianth parts finely dentate. . . . . *A. acuminatum*  
 3 Inner perianth parts entire  
 4 Crests of ovary flat, papillose-denticulate processes. . . . . *A. bisceptrum*  
 4 Crests of ovary rounded, entire. . . . . *A. parvum*

*Allium acuminatum* Hook (Plates 852a, b, c)

HOOKER'S ONION. Infrequent, 6000-9500 ft.; open rocky slopes, ridge tops. Mid Jun-Jul. Chalk Spring 738 254E 43 57 820N, Head of Water Canyon 736 658E 43 55 559N (NAD 83) Clifton 47180, \*Rye Grass Canyon 734 775E 43 61 540N Clifton 48911

*Allium atrorubens* S. Wats.

var. *atrorubens* (Plates 853a, b)

DARK RED ONION. Quite infrequent, below 8500 ft.; fairly heavy soil that is often gravelly. Jun-early Jul. \*Grub Gulch 728 262E 43 30 614N Clifton 51322.

*Allium bisceptrum* S. Wats. (Plates 854a, b)

PATIS ONION. Frequent, 6000-10000 ft.; openings in forests. May-Jul. \*Snake Creek T12N R69E S6, !Wheeler Peak Road 737 949E 43 22 990N.

*Allium nevadense* S. Wats. (Plates 855a, b)

NEVADA ONION. Fairly frequent, below 7400 ft.; sandy or gravelly places. April-Jun. \*Big Wash T12N R70E S27, \*Snake Creek 7600 ft. Raymond Jaindl, \*Highway 894 726 418E 43 04 553N Clifton 43942.

*Allium parvum* Kell. (Plates 856a, b)

DWARF ONION. Fairly frequent, 6000-8600 ft.; open rocky slopes, often barren. May-Jun. \*Snake Creek T12N R69E S10, †Murphy Wash 733 802E 42 92 815N Clifton 43956, †Coyote Canyon 738 360E 43 66 570N Clifton 48928.

## ASPARAGACEAE Asparagus Family

### ASPARAGUS

*Asparagus officinalis* L.

var. *officinalis*

ASPARAGUS. Limited, close to habitation or along roads; introduced from Europe. Jun-Jul. \*Lehman Creek, Baker Ranch 750 000E 43 22 275N Clifton 48850.

## LILIACEAE Lily Family

- 1 Perianth segments over 2 cm long. . . . . *Calochortus*  
 1 Perianth segments less than 2 cm long  
 2 Flowers white with purplish or greenish veins; some leaves basal. . . . . *Lloydia*  
 2 Flowers greenish-brown to chocolate-brown with white or yellow spots or mottling; base and lower stem leafless  
 . . . . . *Fritillaria*

### CALOCHORTUS

- 1 The gland on the petals ± squared at the base; stems weak, most often straggling among other plants, inflorescence often not umbellate. . . . . *C. flexuosus*  
 1 The gland round in outline; stems erect; inflorescence umbellate. . . . . *C. nuttallii*

*Calochortus flexuosus* S. Wats. (Plates 857a, b)

STRAGGLING MARIPOSA. Infrequent, below 6800 ft; rocky slopes. Late Apr-Jun. \*Highway 894 726 265E 43 04 952N Clifton 43934.

*Calochortus nuttallii* T. & G. (Plate 858)

SEGO LILY. Frequent, 5600-8000 ft.; rocky places in openings in sagebrush. Jun-Jul. \*Lower Baker Creek 6800 ft. Raymond Jaindl. \*†Timber Creek 738 621 43 17 280.

### FRITILLARIA

*Fritillaria atropurpurea* Nutt. (Plates 859a, b)

LEOPARD-LILY. Fairly frequent, 6500-10000 ft.; dry gravelly soil in canyons, slopes. Apr-Jul. \*Shingle Creek 9400 ft. Raymond Jandl., Shingle Creek 729 455E 43 20 426N Clifton 45681

### LLOYDIA

*Lloydia serotina* (L.) Salisb. (Plates 860a, b)

ALP LILY. Infrequent, above 10600 ft., North Snake Range; rocky slopes and flats. Late Jun-Jul. The Table 742 273E 43 51 786N (NAD 83) Clifton 47164.

## MELANTHIACEAE Bunch-Flower Family

### ZIGADENUS Death Camas

**Note:** These have now been put in the genus *Toxicoscordion* because of monophyletic garbage.

- 1 Perianth segments (6) 7-11 mm long, sessile; flowers single on the inflorescence branches. . . . . *Z. elegans*
- 1 Perianth segments (3) 3.5-5 (5.5) mm long, at least the inner clawed
  - 2 Inflorescence almost always paniculate; flowers of the main axis always with pistils and stamens in the same flower, flowers of the lower branches often lacking pistils and these have the outer perianth segments not clawed. . . . . *Z. paniculatus*
  - 2 Inflorescence usually racemose, rarely with branches below; flowers all have pistils and stamens in the same flower; outer perianth segments often clawed. . . . . *Z. venenosus*

*Zigadenus elegans* Pursh

var. *elegans* (Plate 861)

ELEGANT DEATH CAMAS. Locally frequent, 7500-10700 ft.; mesic openings in woodlands, limestone cliffs. branch of Lincoln Canyon T12N R68E S29, \*Highland Ridge Road 734 311E 43 09 024N, The Table 742 605E 43 51 715N (NAD 83) Clifton 47167.

*Zigadenus paniculatus* (Nurr.) S. Wats. (Plates 862a, b)

FOOTHILL DEATH CAMAS. Frequent, 6000-8500 ft. open slopes, openings in woodland. Apr-Jun. Pine Creek 727 814E 43 18 592N.

*Zigadenus venenosus* S. Wats. (Plates 863a, b)

DEATH CAMAS. Infrequent, 6700-8200 ft.; vernal moist slopes in openings. May-Mid July. !\*Wheeler Peak Road 738 110E 43 22 760N Clifton 48877, Chalk Spring 738 254E 43 57 820N. [var. *gramineus* (Rydb.) Welsh].

## RUSCACEAE Lily-of-the-Valley Family

### SMILACINA Solomon's-Seal

**Note:** These plants are often put in *Maianthemum*, but the floral structures and the number of fruit chambers are different.

*Smilacina stellata* (L.) Desf. (Plate 864)

STAR FALSE SOLOMON'S-SEAL. Fairly frequent, 5600-8500 ft.; moist, rich soil in riparian; saline encrusted sandy soil on valley bottoms. May-Jul. Spring Valley 720 115E 43 38 100N Clifton 45633. [*Maianthemum s.* (L.) Link]

## OTHER MONOCOT FAMILIES

## ALISMATACEAE Water-plantain Family

- 1 Leaves sagittate (arrow-like). . . . . *Sagittaria*
- 1 Leaves linear-lanceolate to narrowly elliptic or rarely oblong when above water, below water, linear. . . . . *Alisma*

### ALISMA

*Alisma gramineum* Lej.

GRASS-LEAVED WATER-PLANTAIN. Limited, valley bottoms, muddy shores of ponds. Jun-Jul. Spring Valley 722 610E 43 01 628N Clifton 45656.

**SAGITTARIA** Arrowhead, Tule Potato, Wapato

*Sagittaria cuneata* Sheldon (Plates 865a, b)

ARUM-LEAVED ARROW-HEAD. Limited, about 5020 ft.; ponds. Jun-Aug. †Caine Spring 755188E 4336118N Clifton 47298, \*Blind Spring 724 798E 42 97 816N Clifton 51275.

**CYPERACEAE** Sedge Family

- 1 Achenes surrounded by closed bracts (perigynia) . . . . . *Carex*
- 1 Achenes not surrounded by closed bracts
  - 2 Scales of the spikelet spirally imbricated
    - 3 Each flower double-brachiate. . . . . *Lipocarpus*
    - 3 Each flower with a single bract
      - 4 Inflorescence composed of a single spike at the apex of the culm. . . . . *Eleocharis*
      - 4 Inflorescence composed of more than one spike or if only one spike than involucre appears as a continuation of the stem
        - 5 Involucre appears as a continuation of the stem. . . . . *Schoenoplectus*
        - 5 Involucre leaf-like, not appearing as a continuation of the stem. . . . . *Scirpus*
  - 2 Scales of the spikelet 2-ranked. . . . . *Cyperus*

**CAREX** Sedge

**Note:** When collecting sedges, make sure a good root system is attached. The most important thing to remember is that those who work with these plants can fool each other in to thinking they know the plants, but anyone who has traveled far and wide; collected as many plants as this author, would know that they are indeed fooling each other. It is well nigh impossible to key out many of the plants that are found.

- 1 Inflorescence a single spike; perigynia attached directly to the rachis. . . . . **Group 1**
- 1 Inflorescence with several spikes; perigynia attached to the rachilla which is attached to the rachis
  - 2 Leaves or perigynia or both hairy; perigynia never sparsely hispid. . . . . **Group 2**
  - 2 Leaves glabrous (sometimes scabrous on the edges; perigynia glabrous or ciliate on the margins
    - 3 Lowest bract long-sheathing; perigynium essentially beakless. . . . . *C. aurea*
    - 3 Lowest bract sheathless or very short-sheathing
      - 5 Style branches normally 2; akene 2-sided
        - 6 Spikelets stalked or if sessile than elongate. . . . . **Group 3**
        - 6 Spikelets short and sessile
          - 7 Staminate flowers above pistillate flowers on the same plant or staminate and pistillate flowers found on separate plants. . . . . **Group 4**
          - 7 Staminate below pistillate flowers in the same spikelet (sometimes only in the upper spikelets and hard to see at times)
            - 8 Margin of perigynia rounded or sharp-edged; stems solid (Staminate below pistillate flowers at least in the upper spikelets). . . . . **Group 5**
            - 8 Margin of perigynia winged, sometimes wings may be limited to the upper part of the body; stems often hallow (generally staminate and pistillate flowers in every spikelet). . . . . **Group 6**
    - 5 Style branches normally 3 (4); akene 3-sided (sometimes hard to tell). . . . . **Group 7**

**Group 1**

- 1 Plants essentially with the staminate flowers on one plant and the pistillate flowers on another plant
  - 2 Plants with numerous old leaves from previous season; spike denser, darker colored; early season perigynia can't be broken from rachis without fracturing them. . . . . *C. pseudoscirpoidea*
  - 2 Plants lacking leaves from previous season; spike more interrupted, not real dark; early season perigynia can be broken from the rachis intact. . . . . *C. scirpoidea*

- 1 Plants with the staminate flowers above the pistillate
  - 3 Style branched outside of the perigynium; plants in tufts with numerous old leaves, lacking rhizomes
    - 4 The pistillate scales essentially surround the spike; styles 3; perigynium ± turgid, not sharp-margined . . . . . *C. elynoides*
    - 4 The pistillate scales not surrounding the spike; styles 2 or 3 on the same plant; perigynium sharp-margined. . . *C. nardina*
  - 3 Style branched inside of the perigynium; rachilla longer than the akene; plants not in tufts, bearing rhizomes
    - ..... *C. subnigricans*

#### Group 2

- 1 Plants tall, of wet places; spikelets not down in the leaves. . . . . *C. pellita*
- 1 Plants short, of dry places; spikelets with some almost basal. . . . . *C. rossii*

#### Group 3

- 1 Perigynia nerved on both sides, beak bidentate. . . . . *C. nebraskensis*
- 1 Perigynia nerveless on the sides, beak entire or obliquely cleft
  - 2 Lowest bract shorter than the inflorescence; mature pistillate spikes 5-10 mm wide. . . . . *C. scopulorum*
  - 2 Lowest bract usually longer than the inflorescence; mature pistillate spikes 3-5 mm wide. . . . . *C. aquatilis*

#### Group 4

Leaves and perigynia glabrous; spikelets more than one per culm; styles branches 2; achenes 2-sided; spikelets short and sessile; staminate flowers above the pistillate flowers or staminate flowers and pistillate flowers found on separate plants (dioecious)

- 1 Inflorescence a ± globose head; perigynia greatly exceeding the scales. . . . . *C. 'bakeri'*
- 1 Inflorescence may be compact, but not globose; perigynia slightly exceeding or not at all the scales
  - 2 Plants bearing pistillate and staminate flowers on separate plants (rarely in *C. praegracilis*)
    - 3 The culms angles below the inflorescence blunt, smooth (sometimes slightly scabrous in *C. simulata*)
      - 4 Plants growing in places that become dry early in the season; the scales long-tapered. . . . . *C. douglasii*
      - 4 Plants growing in permanently wet places; the scales not long tapered perigynium . . . . . *C. simulata*
    - 3 The culm angles below the inflorescence sharp, markedly scabrous. . . . . *C. praegracilis*
  - 2 Plants with at least some of the spikes bearing both pistillate and staminate flowers
    - 5 Spikes remote, consisting of 1-3 pistillate flowers per spikelet. . . . . *C. disperma*
    - 5 Spikes more congested, with most of them bearing more than 3 pistillate flowers
      - 6 Perigynium quite abruptly contracted into a short beak; when the fruit is mature the marginal ribs appear to be on the lower surface, rather than on the margin. . . . . *C. vallicola*
      - 6 Perigynium tapered into a longer beak, margin not as above
        - 7 Perigynia strongly nerved on both sides; the scales quit a bit shorter and narrower. . . . . *C. 'serpentina'*
        - 7 Perigynia not or obscurely nerved
          - 8 Plants tufted, lacking long rhizomes; plants normally on dry slopes. . . . . *C. occidentalis*
          - 8 Plants not tufted, spaced on a long rhizome; moist to wet places. . . . . *C. praegracilis*

#### Group 5

- 1 The perigynia ascending. . . . . *C. bolanderi*
- 1 The perigynia spreading, in age lower may be reflexed. . . . . *C. interior*

#### Group 6

(Ovales)

Leaves and perigynia glabrous; spikelets more than one per culm; styles branches 2; perigynia lenticular; spikelets short and sessile; staminate and pistillate flowers found on the same plant (monoecious); staminate flowers below pistillate flowers in the same spikelets (always); margins of perigynia winged (sometimes narrowly so)

**Note:** This group of plants have never read the books. Some keys work in various places, but not in others. This author has collect hundreds of sheets of this group, done extensive measurements with very little success of understanding. The plants vary so much that it is almost impossible to write a key that will identify them in all cases. You need very mature fruit. Most

authors seem to be afraid to admit that they don't really know these plants, this one is not. Most likely *C. haydeniana*, *microptera*, and others could easily be made varieties of a single taxon.

- 1 Beak of perigynium almost completely hidden by the scales; perigynium not obvious in the inflorescence
- 2 Beak of perigynium slender and nearly terete only serrulate below the beak, remotely if at all bidentate. . . . . *C. phaeocephala*
- 2 Beak of perigynium flattened and serrulate almost completely to apex, bidentate at apex. . . . . *C. tahoensis*
- 1 Beak of perigynium with at least ½ exposed by the scales; perigynium obvious in the inflorescence
- 3 Perigynium nerveless on the side next to the rachis, margins often wrinkled. . . . . *C. straminiformis*
- 3 Perigynium nerved on the side next to the rachis, margins not wrinkled
- 4 Spikelets more robust; perigynium wings gradually narrowing toward base, point of attachment broad. . . . . *C. microptera*
- 4 Spikelets small; perigynium wings broad clear to base, point of attachment very narrow. . . . . *C. subfusca*
- 3 Perigynium 6-8 mm long. . . . . *C. petasata*

### Group 7

Leaves (sometimes scabrous on the edges) and perigynia glabrous; spikelets ± elongate; style branches 3, akene ± 3-sided

**Note:** The most recent keys for this group of plants are not even workable in the area of this treatment. Many exhibiting characters of several on the same plant. None of the plants here are like *C. helleri* from the Sierra Nevada Mountains in California. In fact *C. helleri* in California is often almost completely pistillate. Some of them have the upper most spikelet bearing pistillate flowers at the base with a few staminate toward the middle, than some more pistillate with a few staminate at the apex.

- 1 Top spikelet staminate or pistillate only (plants of valley floors). . . . . *C. parryana*
- 1 Top spikelet generally with pistillate flowers above the staminate flowers (plants above the valley floor)
- 2 Pistillate scales fairly long-awned. . . . . *C. buxbaumii*
- 2 Pistillate scales not long-awned
- 3 Pistillate scale surface and the mid nerve about the same color
- 4 The culms generally weak, spreading to ± drooping; perigynia smooth on the margins. . . . . *C. pelocarpa*
- 4 The culms generally more erect; perigynia papillose on the upper margins. . . . . *C. chalciolepis*
- 3 Pistillate scales outer surface a different color than the mid nerve. . . . . *C. heteroneura*

#### *Carex aquatilis* Wahl. (Plate 866)

WATER SEDGE. Limited, 7000-10600 ft.; wet meadows and along streams. !Baker Lake 733 376E 43 15 353N. [ var. *altior* (Rydb.) Fern.].

#### *Carex aurea* Nutt. (Plate 867)

GOLDEN-FRUITED SEDGE. Fairly frequent, 5500-10000 ft.; meadows, moist riparian. The fruit color is only seen when they are ready to be shed (late in the season). *C. hassei* L. Bailey has whitish fruit when ready to be shed. \*Lehman Creek T13N R68E S11, Lehman Creek T13N R69E S8, †Baker Creek 735 733E 43 16 750N Clifton 41015, Silver Creek 740 557E 43 37 820N (NAD 83) Clifton 27327.

#### *Carex* 'bakeri' (Plates 868a, b)

MOUNTAIN MEADOW SEDGE. Rare, limited to Baker Lake area, about 10610 ft.; alpine meadows. This taxon has fruit that is identical in shape as *C. incurviformis* (Plate 868c), except the fruit is very glossy, shiny, whereas *C. incurviformis* has a satin finish. This taxon has the pistillate scales translucent brown with the center nerve whitish opaque. *C. incurviformis*, at least the ones from Mount Dana in California, has the scales translucent clear to very light brown. These two descriptions are contrary to the ones in FNANM 2002

#### *Carex bolanderi* Olney (Plates 869a, b)

SHORT-SCALED SEDGE. Infrequent, 6800-9000 ft.; along creeks in fairly dense riparian. \*Lehman Creek T13N R69E S8. [*C. deweyana* Schwein, *C. deweyana* Schwein var. *bolanderi* (Olney) Boott.].

#### *Carex buxbaumii* Wahlenb. Plates 870a, b)

BUXBAUM'S SEDGE. Rare, about 6380 ft.; very wet meadows. Apparently this taxon also grows in the Ruby Marsh area Frank Smith pers. com. Unfortunately this meadow has not been grazed in years and the plants have seemed to disappeared. \*†Baker Creek T13N R69E S14.

#### *Carex disperma* Dewey (Plates 871a, b)

SOFT-LEAVED SEDGE.: Fairly frequent, 6800-8500 ft.; in riparian along streams. !Lehman Creek T13N R69E S8, \*Baker Creek 738 578E 43 17 448N, Wheeler Peak Road Clifton 41021, Pine Creek 729 141E 43 19 349N.

***Carex douglasii*** Boott (Plates 872a, b)

DOUGLAS' SEDGE. Infrequent, 6000-8000 ft.; dryer parts of meadows. \*Strawberry Creek T14N R68E S30, Baker Creek T13N R69E S14, †Snake Creek 745 908 43 10 619.

***Carex elynoides*** Holm (Plates 873a, b, c, d)

KOBRESIA-LIKE SEDGE. Frequent, 10000-12500 ft.; alpine turf. \*Stella Lake T13N R68E S11, †Highland Ridge 734 750E. 43 06 771N, †The Table 742 249E 43 51 786 (NAD 83) Clifton 47162, Mt Moriah 741 465E 43 50 680N Clifton 52235.

***Carex heteroneura*** W. Boott (Plates 875a, b)

VARIOUS-NERVED SEDGE. Frequent, 7600-11000 ft; along streams, wet meadows. \*below Stella Lake T13N R68E S11, Wheeler Peak Road Clifton 41020, †Pine Creek 728 344E 43 18 863N Clifton 45671, The Table 742 273E 43 51 786N (NAD 83) Clifton 47166. [*Carex epapillosa* Mkze.].

***Carex interior*** L. H. Bailey (Plates 876a, b)

INTERIOR SEDGE. Limited to the North Snake Range where it is quite infrequent, about 6340 ft.; very wet meadow. The back surface of the perigynia have up to 9 very distinct nerves, which is like *C. echinata*, but has a short beak like this taxon. Hampton Creek 751 961E 43 47 990N (NAD 83) Clifton 47087.

***Carex microptera*** Mkze. (Plates 877a, b)

SMALL-WINGED SEDGE. Frequent, 6000-10500 ft.; fairly wet meadows, on stream banks. It appears that many of the plants listed below are not this taxon at all. †Baker Creek 738 578E 43 17 448N, \*Burnt Mill Canyon T13N R69E S6, †Lehman Creek 733 174E 43 21 109N, †Lehman Creek T13N R69E S7, †Baker Lake 732 780E 43 15 200N Clifton 40982.

***Carex nardina*** Fries (Plate 878)

NARD SEDGE. Rare, 10360-11400 ft.; limestone ledges on very steep slopes. Our plants have been called variety *hepburnii* which are supposed to have 3 styles and a narrower spike. However these plants have both 2 and 3 styles on the same plant and the spikes are quite broad, which is more like the ones from the Arctic. \*†Highland Ridge 736 040E 43 06 512N Clifton 44524, †Mt. Washington 733 582E 43 10 488N Clifton 45282.

***Carex nebraskensis*** Dewey (Plates 879a, b)

NEBRASKA SEDGE. Frequent, below 10500 ft.; along streams wet meadows, seeps. Some plants have the scales up to 3 times longer than the perigynium which makes the spikes look very bristly. \*Lehman Creek T13N R69E S8, \*Lehman Creek T13N R68E S11, †Baker Creek 739 184E 43 18 776N, †Snake Creek 747 360E 43 11 200N Clifton 41045, Caine Spring 755 173E 43 36 118N Clifton 47296.

***Carex nova*** L. Bailey (Plates 880a, b, c)

DUSKY-FRUITED SEDGE. Infrequent, 10000-12000 ft.; meadows. Wheeler Peak 732 080E 43 19 358N Clifton 52164.

***Carex occidentalis*** L. Bailey (Plates 881a, b, c)

WESTERN SEDGE. Quite infrequent, 6000-10000 ft. riparian, mesic woodland floors. This perigynia are extremely variable. There are some plants in other places that have the perigynia attached to the rachis after the scales have fallen and others where the nerves reach the beak. \*Burnt Mill Canyon T13N R69E S6, Wheeler Peak Campground T13N R68E S11, \*†Baker Creek 738 578E 43 17 448N Clifton 38342.

***Carex parryana*** Dewey (Plates 882a, b)

PARRY'S SEDGE. Limited, about 5765 ft; wet meadow. There is no difference between *C. hallii* and *C. parryana*. There are too many plants from the State of Nevada that have the lateral spikes shorter than the terminal which would make them *C. hallii*, however it is supposed to be east of the Rocky Mountains. Since *C. parryana* is the older name, it will be used in this treatment. †Shoshone Ponds 723 590E 43 12 558N Clifton 43924. [*Carex hallii* Olney].

***Carex pellita*** Muhl. (Plates 883a, b)

WOOLLY SEDGE. Frequent, 6000-9000ft.; wet places in riparian, along streams. \*Lehman Creek T13N R69E S8, Baker Creek 739 185E 43 18 825N. [*C. lanuginosa* Michx. misapplied].

***Carex pelocarpa*** F. H. Herm. (Plates 884a, b)

TOP HEAVY SEDGE. Frequent, above 10500 ft.; rocky slopes and ridge tops. †Bald Mountain 732665E 4322490N Clifton 47282, †Highland Ridge Road 734 262E 43 08 977N, †South of Johnson Lake 734 136E 43 12 618N.

***Carex petasata*** Dewey (Plates 885a, b)

LIDDON SEDGE. Infrequent, 8500-9700 ft.; openings in sagebrush. Jun. \*Timber Creek 738 480E 43 16 650N

***Carex phaeocephala*** Piper (Plates 886a, b, c)

MOUNTAIN HARE SEDGE. Frequent, 9000-11500 ft.; open rocky slopes, crevices. \*Stella Lake T13N R68E S11, Baker Lake 732 730E 43 15 346N Clifton 40976.

***Carex praegracilis*** Boott (Plates 887a, b, c, d, e)

CLUSTERED FIELD SEDGE. Infrequent, below 8500 ft. wet to drying meadows. At 30× the apiculus at the apex of the anthers bristly, the only one in its group that is that way. Baker Creek T13N R69E S14, Snake Creek 746 052E 43 10 600N, Chalk Spring 738 254E 43 57 820N.

***Carex pseudoscirpoidea*** (Rydb.) Cronq. (Plates 888a, b, c)

ROCKY MOUNTAIN SEDGE. Limited, 10680-10900 ft.; alpine turf. This taxon is sort of related to *C. scirpoidea*, however the fruit is adherent to the rachis until late in the season. In *C. scirpoidea* the fruit can be broken from the rachis early in the season without fracturing it. It also has no old leaves from the previous season and the inflorescence is markedly different. The say that all the varieties have the same chromosome number so they are all varieties of a single species, however many other species have the same number and yet they are kept separate. Pyramid Peak Spring 733 840E 43 14 682N Clifton 43277, The Table 742 686E 43 52 756N (NAD 83) Clifton 47168. [*C. scirpiformis* Mkze., *C. scirpoidea* Michx. var. *p.* (Rydb.) Cronq.].

***Carex rossii*** Boott (Plates 889a, b, c, d)

ROSS' SEDGE. Frequent, 7000-11000 ft.; openings in woods, open slopes. \*Burnt Mill Canyon T13N R69E S6, Deerhead Canyon 739 110E 43 52 450N (NAD 83) Clifton 47138, Buck Mountain 733 874E 43 23 227N Clifton 47283.

***Carex scirpoidea*** Michx. (Plates 890a, b)

CANADIAN SINGLE-SPIKE SEDGE. Rare, limited to the North Snake Range, about 7300 ft.; wet meadows in openings in riparian. Eightmile Canyon 732 905 43 63 096 Clifton 45623.

***Carex scopulorum*** Holm

var. *bracteosa* (L. Bailey) Herm. (Plates 891a, b)

MOUNTAIN SEDGE. Frequent, 6500-10000 ft.; along streams and about seeps. \*Lehman Creek T13N R69E S8, Lehman Creek T13N R68E S11, †Baker Creek 738 212E 43 17 425N.

***Carex*** 'serpentina' (Plates 892a, b)

HOOD'S SEDGE. Rare, about 9320 ft.; steep rocky slopes. None of the plants in this group have prominent veins except this one. Branch of North Fork Big Wash 735 754E 43 07 590N Clifton 44547.

***Carex simulata*** Mkze. (Plate 893)

SHORT-BEAKED SEDGE. Local, below 7500 ft.; wet meadows: \*Strawberry Creek T14N R69E S20, \*Lehman Creek 739 412E 43 21 906N, †Shoshone Ponds 723 736E 43 12 660N Clifton 43930, Hendrys Creek 750 554E 43 45 030N.

***Carex straminiformis*** Baily (Plates 984a, b)

MOUNT SHASTA SEDGE. Frequent, 8500 ft. along streams, springs and alpine turf. The margins on the perigynium are often wrinkled. \*†Wheeler Peak Campground 733 174E 43 21 109N, Baker Creek 740 414E 43 19 235N Clifton 40970, †South of Johnson Lake 733 920E 43 12 675N.

***Carex subfusca*** W. Boott (Plates 895a, b)

RUSTY SEDGE. Limited, 6500-7500 ft.; small meadows along creeks: \*Strawberry Creek T14N R69E S30, †Pine Creek 727 240E 43 18 540N Clifton 45687.

***Carex subnigricans*** Stacey (Plate 896)

DARK ALPINE SEDGE. Infrequent, 9500-11000 ft.; meadows, alpine turf, rocky slopes. \*above Johnson Lake T13N R68E S36, †Pyramid Peak 733 783E. 43 14 750N Clifton 40997.

***Carex taehoensis*** F. J. Sm. (Plates 897a, b)

TAHOE SEDGE. Fairly frequent, 9500-10500 ft.; open steep, rocky slopes, openings in sagebrush, margins of small meadows. This is a new taxon for the state of Nevada. It differs from *C. petasata* at a glance by the spikelets being bicolored. *C. petasata* is uniformly brown. Other differences are that the perigynium are smaller, winged to the apex and only slightly nerved at the base on the ventral surface. Above Timber Creek this taxon and *C. petasata* grow very close together. *C. petasata* is well past by the time this taxon is in good flower. Jul. \*†above Stella Lake 732 267E 43 20 237N, Mount Washington 733 918E 43 11 677N Clifton 45272.

***Carex vallicola*** Dewey (Plates 898a, b)

VALLEY LOVING SEDGE. Frequent, 6500-10000 ft; dry to moist slopes, with sagebrush, under aspens. \*Wheeler Peak Campground T13N R68E S11, Timber Creek 737 779 43 15 652 Clifton 42963, †Shingle Creek 729 254E 43 20 141N Clifton 45677.

## CYPERUS

***Cyperus squarrosus*** L. (Plates 899a, b)

BEARDED FLAT-SEDGE. Limited, below 8000 ft.; sand bars along creeks, small vernal moist depressions. The site at Lehman Creek has been altered, but a few plants remain. †Lehman Creek 745 281E 43 21 267, \*Wheeler Peak Road 738 110E 43 22 760N Clifton 48870. [*C. aristatus* Rottb.]

## ELEOCHARIS Spike-Rush

**Note:** The "*E. palustris* complex" is still poorly understood. The taxon called *E. macrostachya* incorporates most of the characters of some of the others within the complex. Having looked at numerous plants, it looks like all the variability may not allow

any way to separate taxa in this group without arbitrarily placing plants in one taxon or the other. **The photos of the fruit in some cases don't show the real color, for shape only.**

## 1 Styles 2

2 The connective between the tubercle and the apex of the fruit not obvious, if there is a slight connective, than it is very broad. . . . . *E. macrostachya*

2 The connective between the tubercle and the apex of the fruit obvious, narrow. . . . . *E. palustris*

## 1 Styles 3

3 Plants with short hair-like stems; fruit ridged both longitudinally and horizontally. . . . . *E. acicularis*

3 Plants with thicker stems, more robust; fruit lacking ridges

4 Spikes 3-7 flowered. . . . . *E. quinqueflora*

4 Spikes over 7 flowered

5 Tubercle elongate, confluent with the achene; stems often long arching and rooting from an apical bulbil. . . . . *E. rostellata*

5 Tubercle elevated and constricted or depressed

6 Tubercle on top of the fruit well elevated and constricted at the base; rhizomes if present fairly clean

7 Tubercle only slightly constricted, lacking a well developed flange; scales orangish brown (drying darker) with a lighter mid strip; rhizomes well developed. . . . . *E. parishii*

7 Tubercle quite constricted with a fairly developed flange; scales uniformly purple black; rhizomes lacking . . . . . *E. 'serpentina'*

6 Tubercle depressed, which may appear almost like an apical scar with a central mucro; rhizomes cluttered with previous years old stems. . . . . *E. bolanderi*

*Eleocharis acicularis* (L.) Roemer & Schultes (Plates 900a, b)

NEEDLE SPIKE-RUSH. Fairly frequent, below 9500 ft.; lake shores, wet meadows. \*Dead Lake T12N R69E S6.

*Eleocharis bolanderi* A. Gray (Plates 901a, b, c)

BOLANDER'S SPIKE-RUSH. Infrequent, below 9000 ft.; wet meadows, seeps and springs. \*†Wheeler Peak Road 738 083E 43 22 858N.

*Eleocharis macrostachya* Britt. (Plates 902a, b)

PALE or CREEPING SPIKE-RUSH. Fairly frequent, below 7600 ft.; wet places. There are two forms of this taxon in this area. The fruit is distinctive enough to be separate taxa The ones from Lehman Creek have the fruit yellow-brown, the perianth bristle are lacking and the plants are on the small side. The plants from Spring Valley have the fruit lemon yellow, the perianth bristles present, and the plants on the robust side. \*Baker Creek 738611E 43 18257N, †Lehman Creek 739412E 4321906N Clifton 43038, †Spring Valley 722 610E 43 0 1628N Clifton 45652, †Want Spring 734 413E 43 34 178N Clifton 48983.

*Eleocharis palustris* (L.) R. & S. (Plates 903a, b)

COMMON SPIKE-RUSH. Fairly frequent, below 9800 ft.; wet places. †Lake Creek 760 026E 43 06 776N Clifton 41067

*Eleocharis parishii* Britt. (Plates 904a, b)

PARISH'S SPIKE-RUSH. Infrequent, below 8000 ft.; wet places, sometimes on the saline side. \*The Cedars T12N R67E S2, \*Snake Creek T12N R70E S18, †Strawberry Creek 733136E 4326162N Clifton 49013.

*Eleocharis quinqueflora* (F. Hartmann) Schwarz (Plates 905a, b)

FEW-FLOWERED SPIKE-RUSH. Infrequent, 5700-10000 ft.; wet to drying meadows. The plants that are found on the branch of Snake Creek are up to 30 cm tall, the fruit is olive to gray. The plants found at the Cedars are up to 7 cm tall with the fruit yellowish. They both have developed fruit in the lowest scale †South Fork Baker Creek 736 852 43 15 174 Clifton 43032, \*†Branch of Snake Creek 737 078E 43 12 036N Clifton 43242, †The Cedars 723 706E 43 12 544N Clifton 45639.

*Eleocharis rostellata* (Torr.) Torr. (Plates 906a, b, c, d)

BEAKED SPIKE-RUSH. Locally frequent, below 7000 ft.; wet saline and fresh water meadows. Baker Creek T13N R69N R14, Strawberry Creek T14N R69E S20, Hendrys Creek 752 034E 43 44 248N.

*Eleocharis 'serpentina'* (Plates 907a, b, c)

SNAKE RANGE SPIKE-RUSH. Rare, about 8000 ft.; streamlet in a meadow complex. There seems to be nothing like this in the US. †Strawberry Creek 733 136E 43 26 162N Clifton 49013

## LIPOCARPHA

*Lipocarpa drummondii* (Nees) G. C. Tucker (Plate 908)

AWNED LIPOCARPHA. Limited to Lehman Creek drainage, 5800-6000 ft.; sandbars, moist margins along creeks. In the latest works, the line drawings for several of the species within this genus seem to be out of character with the description. For *L. aristulata* and *L. drummondii* the description has the outer floral scale being long-acuminate, however the drawings has them

hardly acuminate. These plants have the outer floral scales of *L. micrantha* with the inner those of *L. drummondii* which almost completely surround the fruit. These plants are associated with *Cyperus squarrosus*. This is a new taxon for the State. Jul-Aug. !Lehman Creek 745 281E 43 21 267N (The site has been altered with these plants not evident), \*†Lehman Creek 745 118E 43 22 085N Clifton 52150.

### SCHOENOPLECTUS

- 1 Stems round throughout, hollow. . . . . *S. acutus*  
 1 Stems triangular at least above, not hollow  
 2 Plants with wiry culms, the upper part with sides ± convex; scales of the spikelet with awns 0.5-1.5 mm long. . . . . *S. pungens*  
 2 Plants with culms not wiry, the sides deeply concave; scales of the spikelet with an awn less than 0.5 mm long  
 . . . . . *S. americanus*

*Schoenoplectus acutus* (Muhl. ex Bigel.) A. & D. Löve

var. *occidentalis* (S. Wats.) S. G. Sm. (Plates 909a, b)

VISCID BULRUSH; VISCID TULE. Fairly frequent, usually below 5000 ft.; marshes and margins of rivers. May-Aug. †Lake Creek 239 834E 43 06 428N Clifton 44991. [*Scirpus a.* Bigelow var. *o.* (S. Wats.) Beetle].

*Schoenoplectus americanus* (Pers.) Volk. ex Schinz & Keller (Plates 910a, b, c)

THREE-SQUARE. Limited, below 7000 ft.; wet places, sometimes subalkaline. Inflorescence seems to be quit variable. Jun-Sep. Warm Creek 756 426E 43 71 505N Clifton 51302. [*Scirpus a.* (Pers.)].

*Schoenoplectus pungens* (Vahl) Palla

var. *longispicatus* (Britt.) S. G. Sm. (Plates 911a, b, c, d)

COMMON THREESQUARE. Fairly frequent, below, 7000 ft.; wet places, tolerant of alkali. This taxon is extremely variable in the color of the scales, and the fruit. \*The Cedars T12N R67E S2, †Turnley Canyon 729 201E 43 37 857N, †\*Want Spring 734 413E 43 34 178N Clifton 48983, Caine Spring 755 188E 43 36 118N Clifton 47297. [*Scirpus p.* Vahl var. *l.* (Britt.) Cronq.].

### SCIRPUS

*Scirpus microcarpus* Presl (Plates 912a, b)

SMALL-FRUITED BULRUSH. Fairly frequent, 6500-8500 ft.; wet places. Lehman Creek T13N R69E S8.

### IRIDACEAE Iris Family

- 1 Perianth segments 4.5-6 cm long. . . . . *Iris*  
 1 Perianth segments 0.9-1 cm long. . . . . *Sisyrinchium*

### IRIS Flag, Fleur-de-lis

*Iris missouriensis* Nutt. (Plate 913)

WESTERN IRIS or BLUE-FLAT. Infrequent, below 8500 ft.; marshes, moist meadows, streambanks, sometimes in aspens. May-July. Hamlin Valley T10N R70E S12, †The Cedars 723 769E 43 12 662N Clifton 43914.

### SISYRINCHIUM Blue-eyed Grass

- 1 Stems erect, mostly not much branched; translucent margins of inner bract extending above tip as 2 rounded lobes. . . . . *S. halophilum*  
 1 Stems ascending or flexuous, mostly branched except on plants that have been browsed by cattle; translucent margins of inner bract not extending to tip. . . . . *S. demissum*

*Sisyrinchium demissum* Greene (Plate 914)

STIFF BLUE-EYED GRASS. Limited, below 7000 ft.; moist sites, not as wet as the next. May-Aug. \*The Cedars T12N R67E S2, †Snake Creek 476 052E 43 10 600N Clifton 41060.

*Sisyrinchium halophilum* Greene (Plate 915)

NEVADA BLUE-EYED GRASS. Infrequent, below 8000 ft.; along streams and wet meadows. May-Aug. \*Baker Creek T13N R69E S14.

**JUNCACEAE** Rush Family

- 1 The sheathing part of the leaf closed; leaf soft and flat, grass-like. . . . . *Luzula*  
 1 The sheathing part of the leaf open; leaf when present stiff not much grass-like. . . . . *Juncus*

**JUNCUS** Rush

- 1 Plants annual. . . . . *J. bufonis*  
 1 Plants perennial  
 2 Lowest bract terete and exactly like a continuation of the stem  
 3 Flowers normally more than 6; plants normally with creeping rootstalks; seeds not tailed. . . . . *J. arcticus*  
 3 Flowers 1-3, rarely 4-5; plants lacking creeping rootstalks; seeds tailed. . . . . *J. parryi*  
 2 Lowest bract not exactly like a continuation of the stem; inflorescence seemingly terminal  
 4 Leaf blades with crosswalls (feels like bumps when running fingers up the blade) these crosswalls either complete or incomplete  
 5 Crosswalls complete, blade cylindrical, has no open edges above base  
 6 Perianth segments long acuminate; flowers in tight balls, flowers pointing in all directions. . . . . *J. torreyi*  
 6 Perianth segments not or shortly acuminate; flowers ± erect  
 7 Inflorescence a single capitate head (2); anthers 0.5-1.0 mm long, shorter than the filaments. . . . . *J. mertensianus*  
 7 Inflorescence normally with (2) 4-30 heads; anthers 1.0-2.0 mm long, longer than the filaments. . . . . *J. nevadensis*  
 5 Crosswalls incomplete, blade flat with the edges open well above the base. . . . . *J. ensifolius*  
 4 Leaf blade lacking crosswalls  
 8 Leaf blades 0.4-0.8 mm wide  
 9 Capsule distinctly retuse at the summit and fully 3-celled; auricles hyaline, acutish. . . . . *J. confusus*  
 9 Capsule obtuse to truncate at the summit and only imperfectly 3-celled; auricles tough, rounded. . . . . *J. dudleyi*  
 8 leaf blades 1.5-3 (4) mm wide; auricles rounded. . . . . *J. longistylis*

***Juncus arcticus*** Willd.

var. ***balticus*** (Willd.) Trautvetter (Plate 916)

WIRE or ARCTIC RUSH. Frequent, below 8000 ft.; wet or dry places with some water below ground surface. The only difference between *J. balticus* and *J. arcticus* is the number of stamens which most likely is not enough difference to warrant species separation: \*Strawberry Creek T14N R69E S20, Baker Creek T13N R69E S14, †Baker Creek 738 822 43 18 448, Chalk Spring 738 254E 43 57 820N. [*J. balticus* Willd., *J. mexicanus* Willd.]

***Juncus bufonis*** L.

- a Capsule oblong 3-4.5 mm long; perianth 4-7 mm long. . . . . var. *bufonis*  
 a Capsule sub-globose, 2-3 mm long; perianth 2-4 mm long. . . . . var. *occidentalis*

var. ***bufonius*** (Plate 917)

COMMON TOAD RUSH. Infrequent, below 6800 ft.; margins of streams, vernal moist flats, outflows of springs. \*The Cedars T12N R67E S2, †Burnt Mill Canyon T13N R69E S6.

var. ***occidentalis*** F. J. Herm. (Plates 918a, b)

ROUND-FRUITED TOAD RUSH. Limited, about 8000 ft.; small vernal moist depressions. May-Jun. \*Wheeler Peak Road 738 110E 43 22 760N Clifton 48870, †South Fork Baker Creek 737 230E 43 16 660N Clifton 52157.

***Juncus confusus*** Cov.

COLORADO RUSH. Infrequent, below 10000 ft. meadows along streams, mesic woods. \*Lehman Creek T13N R68E S11, †Burnt Mill Canyon T13N R69E S6, Wheeler Peak Trail 732 416 43 21 386.

***Juncus dudleyi*** Wieg. (Plates 919a, b)

DUDLEY'S RUSH. Below 7,500 ft.; wet places. This taxon has been submersed under *J. tenuis* by some and others have made it a variety. June. \*The Cedars T12N R67E S2.

***Juncus ensifolius*** A. Nels.

- a Heads few flowered, not in a tight ball. . . . . var. *brunnescens*  
 a Heads numerous flowered, in a tight ball. . . . . var. *montanus*

var. ***brunnescens*** (Rydb.) Cronq. (Plate 920)

SMALL-HEADED ROCKY MOUNTAIN RUSH. Frequent, below 10,000 ft.; meadows, along streams and other wet places. This group of plants have been played with over a number of years by a number of different workers. They have been shuffled between several species and or varieties of the several species.. Each place they have been put is defensible to some extent. However some of the characters used to separate them sometimes show up on the same plant. Yet the two varieties represented in the area of this treatment seem to keep their separate identity quite well. July-Sept. \*Baker Creek 738 212E 43 17 425N, !Baker Creek T13N R69E S29 Clifton 11781. [*J. saximontanus* A. Nels. in part].

var. *montanus* (Engelm.) C. L. Hitchc. (Plate 921)

LARGE HEADED ROCKY MOUNTAIN RUSH. Frequent, below 9000 ft.; meadows, along streams and other wet places. July-Sept. \*Baker Creek 739 184E 43 18 776N, !Lehman Creek T13N R69E S8 Clifton 11710. [*Juncus saximontanus* A. Nels. in part].

*Juncus longistylis* Torr. (Plate 922)

LONG-STYLED RUSH. Frequent, 6000-9000 ft.; along creeks, wet meadows, and springs. \*Baker Creek 738 212E 43 17 424N, !Burnt Mill Canyon T13N R69E S6, The Cedars 723 706 43 12 544 Clifton 45638.

*Juncus mertensianus* Bong. (Plate 923)

MERTENS' RUSH. Fairly frequent, 8000-11000 ft.; wet meadows, along streams. \*Lehman Creek T13N R68E S11, !Wheeler Peak Road T13N R69E S6, † Bald Mountain 733 211 43 22 300.

*Juncus nevadensis* S. Wats. (Plate 924)

NEVADA or SIERRA RUSH. Frequent, below 10200 ft.; along streams, wet meadows and springs. Most of the plants in the area of this treatment are the green phase. The blue-glaucus phase is found to the west. \*The Cedars T12N R67E S2, !Baker Creek T13N R69E S14 Clifton 11381, †Lehman Creek 739 412E 43 21 906N Clifton 43036.

*Juncus parryi* Engelm.

PARRY'S RUSH. Infrequent, 10000-11200 ft.; open rocky slopes. \*above Johnson Lake T13N R68E S36, †South of Johnson Lake 733 933E 43 12 625N.

*Juncus torreyi* Cov. (Plate 925)

TORREY'S RUSH. Fairly frequent, below 6600 ft.; along streams, roadside ditches, seeps, these sometimes associated alkali. \*Big Springs Creek T10N R70E S1, \*Hamlin Valley T10N R70E S1, The Cedars T12N R67E S2, !Willow Patch Spring T15N R68E S36.

#### LUZULA Wood Rush

- 1 Inflorescence an open panicle. . . . . *L. parviflora*  
1 Inflorescence a congested spike. . . . . *L. spicata*

*Luzula parviflora* (Ehrh.) Desv. (Plate 1054)

SMALL-FLOWERED WOOD RUSH. Infrequent, 6000-10000 ft.; wet margins of streams. \*Baker Creek T13N R69E S21, !Lehman Creek T13N R68E S11, †Baker Creek 734 400E 43 15 450N Clifton 41003.

*Luzula spicata* (L.) DC. (Plates 926a, b)

SPIKED WOOD RUSH. Frequent, above 10000 ft. alpine turf, rocky slopes. There are plants that have some of the leaves broad and flat, the perianth segments light brown and the bracts not very fimbriate. These may represent an undescribed variety. \*Stella Lake T13N R68E S11, !Pyramid Peak 11 07 33 594E 43 14786N, †Baker Lake 732 780E 43 15 200N Clifton 40981.

### JUNCAGINACEAE Arrowgrass Family

#### TRIGLOCHIN

**Note:** In the latest works the below two taxa have been made into one called *T. maritima*

- 1 Ligules entire, rarely slightly bilobate, 1.5-5 mm long; plants closely tufted on the rhizome. . . . . *T. maritima*  
1 Ligules strongly bilobate or emarginate, 0.5-1 mm long; plants well spaced on the rhizome. . . . . *T. concinna*

*Triglochin concinna* Davy

var. *debilis* (M.E. Jones) J. T. Howell (Plates 927a, b)

LOW ARROWGRASS. Infrequent, below 6000 ft.; alkaline marsh. \*Hamlin Valley T10N R70E S1, †The Cedars 723 809E 43 12 600N Clifton 40956.

*Triglochin maritima* L.

var. *elata* (Nutt.) A. Gray (Plate 928)

INTERIOR ARROWGRASS. Limited, below 7,000 ft.; wet meadows. Var. *maritima* from the NW has fruit ovoid and 3-4 mm long,  $2n=48$ . Var. *elata* has the fruit is longer and narrower, 4-6 mm long,  $2n=144$ . Jun-Aug. \*Strawberry Creek T14N R69E S20, †Spring Valley 722 768E 43 01 566N Clifton 45650, north of North Millick Spring 725 220E 43 56 050 (NAD 83) Clifton 47190.

### LEMNACEAE Duckweed Family

**Note:** The major brakes used in keys is how many veins there are. Once in a while the veins show. They say backlighting works, but this author is not convinced that works. The collection of *L. minor* has some of the fronds with obvious veins without back lighting, there are others in this collection that don't have any veins even with backlighting. Frond shapes also don't mean anything. This author has a sneaking hunch that many collections are misidentified (his collections included). These plants are said to be nested within Araceae, however these people are only fooling themselves.

#### LEMNA

- 1 Air chambers in two layers, this can be seen by cutting the frond into (30×), sometimes frond with 3 veins that are fairly obvious. . . . . *L. minor*  
 1 Air chambers in a single layer; vein one, often not seeable with backlighting. . . . . *L. minuta*

*Lemna minor* L. (Plate 929)

LESSER DUCKWEED. Fairly infrequent, floating on water. Rarely are flowers found on these plants. \*The Cedars 723 804E 43 12 670N Clifton 52118

*Lemna minuta* Kunth (Plate 930)

SMALL DUCKWEED. Limited, below 7,500 ft.; floating on water from seeps and slow moving streamlets. Some of the plants from Baker Creek have the fronds attached one to the other, this author has not seen this before in this species. Jun-Sep. when it flowers. \*†Baker Creek 739 755E 43 19 124N Clifton 40972.

### LILAEACEAE Quillwort Family [Juncaginaceae]

**Note:** Taxonomists persist in putting this in Juncaginaceae, but it has a very different flowering regime.

#### LILAEA

*Lilaea scilloides* (Poir.) Hauman (Plates 931a, b, c)

FLOWERING QUILLWORT. Rare, about 5800 ft.; muddy and marshy places. May-Jul. The Cedars. [*L. subulata* Humb. & Bonpl., *Triglochin s.* (Poir.) Mering & Kaderet].

### ORCHIDACEAE Orchid Family

- 1 Plants lacking leaves; stems reddish. . . . . *Corallorhiza*  
 1 Plants with leaves; stems green  
   2 Leaves 2, opposite or subopposite. . . . . *Listera*  
   2 Leaves more than two, scattered along the stem  
     3 Flowers 15-30 mm long; capsules reflexed; flowers purplish-brown. . . . . *Epipactis*  
     3 Flowers less than 15 mm long; capsule erect; flowers white to greenish  
       4 Flowers not arranged in a spirale. . . . . *Platanthera*  
       4 Flowers arranged in a spirale. . . . . *Spiranthes*

#### CORALLORHIZA Coral Root

*Corallorhiza maculata* Raf. (Plate 932)

SPOTTED CORAL ROOT. Fairly frequent, 7500-10100 ft. in deep humus in woodlands. Jun-Jul. !Buck Mountain T13N R68E S1, \*Can Young Canyon 7600 ft. Raymond Jaendl., Timber Creek 738 106E 43 16 126N, †Baker Creek 738 904 43 18 235, \*Strawberry Creek 734 260E 43 26 620N Clifton 49008.

## EPIPACTIS

*Epipactis gigantea* Hook. (Plate 933)

STREAMSIDE ORCHID. Quite infrequent, 5900-6400 ft. wet springs, along creeks. Jun-Aug. Baker Creek 743 438E 43 20 239N, Hendrys Creek 752 034E 43 44 252N.

## LISTERA

*Listera convallarioides* (Swartz) Torr. (Plate 934)

BROAD-LEAVED TWAYBLADE. Infrequent, 6000-8000 ft.; deep shade in riparian. Jun-Jul. \*Snake Creek T12N R69E S8, Pine Creek 728 867E 4 31 9324N.

## PLATANThERA

- 1 Flowers white. . . . . *P. leucostachys*  
 1 Flowers yellow-green. . . . . *P. sparsiflora*

*Platanthera dilatata* (Pursh) Lindl.

- a The spur much longer than the lower lip; flowers have very little fragrance. . . . . *P. leucostachys*  
 a The spur about as long as the lower lip; flowers fragrant. . . . . *P. dilatata*

var. *dilatata*

SHORT-SPURRED WHITE BOG ORCHID. Limited, 10200-10400ft.; wet places. Jul-Aug. †Wheeler Peak Trail 732 609 43 21 307.

var. *leucostachys* Lindl. (Plate 935a, b)

LONG-SPURRED WHITE BOG ORCHID. Frequent, 6000-9000 ft.; streams, wet meadows, springs. Jul-Aug. !Lehman Creek T13N R69E S8, \*Lehman Creek Campground Joyce Quinn, †Baker Creek 740 414E 43 19 235N Clifton 40971. [ *Habenaria d.* (Pursh) Hook. var. *leucostachys* (Lindl.) Ames]

*Platanthera sparsiflora* (S. Wats.) Schltr. (Plates 936a, b)

SPARSELY FLOWERED BOG ORCHID. Local, 6000-7500 ft.; along streams, in meadows and about springs. None of the plants that grow here even remotely look like some of the plants that grow in California. Even within this treatment there are a number of specimens that the flowers don't look the same. There are several characters that seems to be overlooked in the this group of plants. The two side petals are either straight or completely curled around and framing the reproductive system when the flowers are mature; how larger the anthers are and how far apart and is the lip tubular or flattened. Most of the plants along Snake Creek have the two side petals completely framing the reproductive system and if they were straighten out, would be longer than the hood-like sepal; the lip is tubular. The plants on Silver Creek have the two side petals straight along each margin of the hood-like sepal and are as long; the lip is broadly flatten at the base. **WHAT THIS AUTHOR IS SAYING IS THAT WE DON'T EVEN REMOTELY KNOW THESE PLANTS YET.** Mid Jun-Aug. !Lehman Creek T13N R69E S8, †Snake Creek 746 410E 43 10 612N, Silver Creek 740 557E 43 37 820N (NAD 83) Clifton 47089.

## SPIRANTHES

*Spiranthes romanzoffiana* Cham (Plate 937)

HOODED LADIES'-TRESSES. Limited, wet meadows. Late Jul-Aug. South Fork Baker Creek 737 260 43 16 654 Clifton 43234.

## POACEAE Grass Family

**Note:** The tribe Triticeae, consists of numerous interbreeding taxa that have moved from one genus to another over a number of years because no one worker agrees as to their proper placement. Since this is the case the most workable method is to put them all in the same genus. In this treatment this has been done except for *Agropyron* (Crested Wheatgrass) which has been left as a genus separate from Elymus. There are numerous named crosses within this group, which means that some of the plants may not key out.

- 1 Florets mostly producing bulblets that have dark, shiny, purple bases and protruding foliaceous linear tips. . . . . *Poa*

- 1 Florets not producing bulblets
  - 2 Spikelets 1-sided
    - 3 Spikes 1 or 2 per stem, spreading; plants of grassland..... *Bouteloua*
    - 3 Spikes usually more than 2, appressed; plants of alkali..... *Spartina*
  - 2 Spikelets not 1-sided
    - 4 Ligules lacking..... *Echinochloa*
    - 4 Ligules usually present, sometimes reduced to a ring of hairs
      - 5 Glumes subtended by bristles..... *Setaria*
      - 5 Glumes not subtended by bristles, glumes may be reduced to awns
        - 6 Glumes and or lemmas or both aristate to long awned
          - 7 The awns of the glumes dimorphic, the lateral spikelets with the first glume awned from a displaced midnerve at one side and the central with each of the five nerves extending into an irregular awn..... *Hilaria*
          - 7 The awns of the glumes in no respects as above
            - 8 Lemmas awned from back or from between a strongly bilobed apex (at least on some of the florets)..... **Group 1**
            - 8 Lemmas aristate to long awned from tip (tip may be bidentate)..... **Group 2**

**Group 1** Lemmas awned from back or from between a strongly bilobed apex

- 1 Florets usually 1 per spikelet
  - 2 Glumes with ciliate hairs on the mid-nerve
    - 3 Glumes awned; lemmas aristate..... *Phleum*
    - 3 Glumes lacking awns; lemmas longer awned..... *Alopecurus*
  - 2 Glumes lacking ciliate hairs
    - 4 Apex of the lemma toothed at the apex..... *Calamagrostis*
    - 4 Apex of the lemma not toothed..... *Agrostis*
- 1 Florets 2 or more (in the lower spikelets in *Calamagrostis*)
  - 5 Awns of lemma 28-45 mm long..... *Avena*
  - 5 Awns up to 14 mm long
    - 6 Lemmas awned from between a bilobed apex
      - 7 Awn of first floret 10-14 mm long, geniculate, awn of second floret small, straight..... *Arrhenatherum*
      - 7 Awns of the florets about the same
        - 8 Spikelets with the upper floret having a short hooked awn at the apex of the lemma..... *Holcus*
        - 8 Spikelets with all the florets having straight or geniculate awns
          - 9 Glumes exceeding the florets..... *Danthonia*
          - 9 Glumes shorter than the florets..... *Bromus*
    - 6 Lemmas awned from below apex
      - 10 Apex of lemma bifid..... *Trisetum*
      - 10 Apex of lemma toothed
        - 11 Inflorescence compressed; base of leaf with a narrow pubescent band; anthers 2-3 mm long..... *Calamagrostis*
        - 11 Inflorescence open to loose, or if contracted than anthers 0.3-0.5 mm long; base of leaf lacking a pubescent band..... *Deschampsia*

**Group 2** Lemmas aristate to long awned from tip

- 1 Glumes appearing to be reduced to awns
  - 2 Inflorescence with lateral spikelets pedicellate, central sessile..... *Hordeum*
  - 2 Inflorescence not as above..... *Elymus*
- 1 Glumes fairly well developed
  - 3 Florets one per spikelet
    - 4 Lemma awns three-parted..... *Aristida*
    - 4 Lemma awns simple
      - 5 Glumes awned..... *Polypogon*
      - 5 Glumes lacking awns
        - 6 Lemma mucronate..... *Muhlenbergia*
        - 6 Lemma well awned..... *Stipa*
  - 3 Florets 2 or more per spikelet

- 7 Plants with the fourth lemma reduced to 3 plumose awns, sheath of leaves broad hyaline margined, striate, abruptly narrowed above the collar. . . . . *Blepharidachne*
- 7 Plants not as above
- 8 Leaves pungent, white-margined; inflorescence among the leaves. . . . . *Munroa*
- 8 Leaves usually not pungent, not white-margined; inflorescence elevated above the leaves
- 9 Inflorescence with the branches (at least the bottom) obvious
- 10 Plants usually 2-3 m tall; leaves 10-40 mm wide; rachilla with quite dense villous hairs as long or a little longer than the floret. . . . . *Phragmites*
- 10 Plants less than 2 m tall; leaves usually 10 mm or less wide; rachilla not long villous hairy
- 11 Glumes short awned. . . . . *Dactylis*
- 11 Glumes lacking awns
- 12 First glume 2-4 mm long; spikelets 5-15 mm long; perennial
- 13 Leaves lacking auricles. . . . . *Festuca*
- 13 Leaves having auricles. . . . . *Schedonorus*
- 12 First glume 4.5-11 mm long; spikelets 14-30 mm long, only one less than 17 mm long, than it is an annual. . . . . *Bromus*
- 9 Inflorescence usually lacking obvious branches, if some branches present than inflorescence contracted
- 14 Inflorescence flat, spikelets closely imbricate and divergent from the rachis
- 15 Plants perennial. . . . . *Agropyron*
- 15 Plants annual. . . . . *Eremopyrum*
- 14 Inflorescence not flattened, spikelets not closely imbricate and divergent from the rachis, or if somewhat imbricate than not divergent from the rachis
- 16 Glumes with the inner lacking. . . . . *Lolium*
- 16 Glumes both present
- 17 Plants annual, rarely biennial
- 18 Plants rarely over 3 dm tall; spikelet less than 2 cm long (including awns). . . . . *Vulpia*
- 18 Plants 6-18 dm tall; spikelet 4-15 cm long (excluding awns). . . . . *Secale*
- 17 Plants perennial
- 19 Spikelets 4-5 mm long (has not been found yet, is not in the text). . . . . *Koeleria*
- 19 Spikelets 10 mm or longer (not counting the awns). . . . . *Elymus*

**Group 3** Glumes and or lemmas acute, rounded or truncate

- 1 Fertile florets 1 per spikelet
- 2 Sterile lower 2 florets limited to narrow, hairy appendages. . . . . *Phalaris*
- 2 Sterile lower 2 florets lacking or limited to a single glume
- 3 Florets appearing to have 3 glumes, sterile floret limited to a single lemma. . . . . *Panicum*
- 3 Florets having only 2 obvious glumes, sterile floret lacking
- 4 Glumes longer than the floret. . . . . *Agrostis*
- 4 Glumes shorter than floret or second glume equal to floret
- 5 Lemma with a single mid-nerve. . . . . *Sporobolus*
- 5 Lemma 3-nerved (sometimes obscurely so). . . . . *Muhlenbergia*
- 1 Fertile florets 2 or more per spikelet (sometimes 1 per spikelet in the same inflorescence that has 2)
- 6 Glumes erose to dentate and usually also the lemmas or lemmas serrate
- 7 Leaf sheath closed from 1/2 to near top
- 8 Spikelets mostly 2-flowered; lemmas 3-nerved. . . . . *Catabrosa*
- 8 Spikelets mostly 3-or more-flowered; lemmas usually 7-nerved. . . . . *Glyceria*
- 7 Leaf sheath with margins strongly roll, but open
- 9 Florets perfect; lower branches spreading. . . . . *Puccinellia*
- 9 Florets imperfect; lower branches erect. . . . . *Distichlis*
- 6 Glumes not erose to dentate, nor lemmas
- 10 Spikelets 10-24 mm long
- 11 Leaf sheath closed above middle or nearly full length
- 12 Spikelets 20-24 mm long. . . . . *Bromus*
- 12 Spikelets 10-15 mm long
- 13 Leaf sheath closed nearly full length; first glume 6-8 mm long. . . . . *Melica*
- 13 Leaf sheath closed to above middle; first flume 2.5-4 mm long. . . . . *Poa*

- 11 Leaf sheath open nearly to base  
 14 Inflorescence with obvious branches, ± open. . . . . *Festuca*  
 14 Inflorescence not or obscurely branched, contracted. . . . . *Elymus*  
 10 Spikelets 1-10 mm long, if 10 mm long leaf sheath closed to above middle  
 15 Inflorescence diffusely branched, branchlets long; florets very small. . . . . *Muhlenbergia*  
 15 Inflorescence not as diffusely branched, sometimes contracted, if fairly widely branching than branchlets  
 short and florets larger  
 16 Glumes different in shape, first linear, second oblanceolate to broadly obovate. . . . . *Sphenopholis*  
 16 Glumes about the same in shape  
 17 The two nerves of the palea extending into bristle tips; glumes obviously about as long as the florets. . . . *Trisetum*  
 17 The two nerves of the palea not extending into bristle tips; glumes usually somewhat to much shorter  
 than the florets  
 18 Inflorescence silvery looking because the lemmas are shiny (has not been found yet, is not in the text). . . *Koeleria*  
 18 Inflorescence not silvery; lemmas green to purplish. . . . . *Poa*

#### AGROPYRON

##### *Agropyron desertorum* (Fischer) Schultes (Plate 938)

DESERT CRESTED WHEATGRASS. Frequently planted, below 10000 ft. along road margins; introduced from Europe. Jul-Sep. !Wheeler Peak Campground Road T13N R69E S6, \*Baker Creek 738 925E 4318 597N.

#### AGROSTIS Bent-Grass

- 1 Palea obsolete or a minute nerveless scale  
 2 Panicles narrow, congested. . . . . *A. exarata*  
 2 Panicles defuse, open. . . . . *A. scabra*  
 1 Palea ½-¾ as long as the lemma  
 3 Inflorescence when mature open; plants 4-10 dm tall  
 4 Plants lacking rhizomes; widest leaves up to 5 mm. . . . . *A. stolonifera*  
 4 Plants bearing rhizomes; widest leaves up to 8 mm. . . . . *A. gigantea*  
 4 Inflorescence contracted; plants 0.3-2 dm tall. . . . . *A. humilis*

##### *Agrostis exarata* Trin. (Plates 939a, b)

SPIKED BENT-GRASS, WESTERN BENT-GRASS. Frequent, below 9000 ft.; riparian. There have been some varieties named, but they all intergrade. Jul-Aug. \*Baker Creek T13N R69E S21, Lehman Creek T13N R69E S8, !Lehman Creek T13N R68E S11.

##### *Agrostis gigantea* Roth. (Plate 940)

BLACK BENT. Limited, below 6300 ft. along streams and other wet places. \*†Snake Creek 749 627E 43 11 434N.

##### *Agrostis humilis* Vasey (Plate 941)

MOUNTAIN BENT. Infrequent, 10000-11000 ft.; meadows along streams. Jul-Aug. \*Lehman Creek T13N R68E S11. \*†Baker Creek 734 400E 43 15 450N Clifton 41010, Wheeler Peak Trail 733 116 43 21442 Clifton 43004. [*A. thurberiana* A. S. Hitchc.].

##### *Agrostis scabra* Willd. (Plates 942a, b)

TICKLEGRASS. Frequent, 6000-10500 ft.; meadows, lake shores. Jul-Aug. The plants at Dead Lake have shorter spikelets and approach *A. idahoensis* but the branching of the inflorescence is that of this taxon. †Lehman Creek 733 167E 43 21 075N. \*Baker Creek T13N R69E S21, \*Dead Lake T12N R69E S6, North Fork Baker Creek 34 142E 17 250N.

##### *Agrostis stolonifera* L. (Plates 943a, b)

REDTOP, CARPET BENT-GRASS. Frequent, below 9000 ft.; riparian, springs; introduced from Europe. Jun-Sep. Lehman Creek T13N R69E S8, !Willow Patch Spring T15N R68E S36, †Snake Creek 476 052E 43 10 600N Clifton 41062.

#### ALOPECURUS

##### *Alopecurus aequalis* Sobol. (Plate 944)

SHORT-AWNED FOXTAIL. Infrequent, below 6000 ft.; wet places. Jun-Aug. \*The Cedars T12N R67E S2.

#### ARISTIDA

**Note:** A number of taxa have been crammed into *A. purpurea* as varieties. These varieties are as much different as others that have been left separate. Here tradition is follow.

- 1 The awns 1.5-2.5 cm long. . . . . *A. glauca*  
 1 The awns 6-8 cm long. . . . . *A. longiseta*

***Aristida glauca*** (Nees) Walp. (Plates 945a, b)

BLUE-GREEN THREE-AWN. Fairly frequent, below 6000 ft.; sandy to gravelly slopes and flats. May-Jun. \*Cross Road T13N R70E S5, †Lehman Creek T13N R69E S12, †Cave Canyon 747 325E 43 10 610N 51334.

***Aristida longiseta*** Steud. (Plate 946)

LONG AWNED THREE AWN. Often along roads.

**ARRHENATHERUM** Oat-Grass

***Arrhenatherum elatius*** (L.) J. & C. Presl (Plates 947a, b)

TALL OAT-GRASS. Rare, usually below 7700 ft., waste places, along streams; introduced from Eurasia. This plant is sometimes used as a soil binder. May-Jul. Hendrys Creek 750 532E 43 45 055N Clifton

**AVENA**

***Avena fatua*** L. (Plates 948a, b)

WILD OAT. Limited, below 5500 ft.; disturbed places about farms; introduced from Europe. May-Aug. \*Baker Creek Ranch T13N R70E S3.

**BLEPHARIDACHNE**

***Blepharidachne kingii*** (s. Wats.) Hack. (Plates 949a, b)

KING'S EYELASH GRASS. Limited, below 6500 ft.; gravelly soil on valley floors. †Marble Wash 241 953E 43 66 510N Clifton 48964.

**BOUTELOUA** Grama

***Bouteloua gracilis*** (Kunth) Lag. (Plate 950)

BLUE GRAMA Fairly frequent, 5600-8500 ft.; rocky slopes, ridges, flats, openings in pinyon-juniper. \*Snake Creek T12N R69E S9, †Lehman Creek T13N R69E S12.

**BROMUS** Brome

**Note:** The distinction that separates some of the taxa in section bromopsis is dependent on a single character, which can show up on any given plant in any given place, veins on the 1<sup>st</sup> glume 1 or 3 and or the placement of hairs on the lemmas. They think they are separating species when they are separating the end points on a multidimensional spectrum with many plants combing these end points. After looking at sheets of the *B. ciliatus* complex, this author is convinced that there is no real way to separate them. The characters as set forth (Saarela et al. 2007 Aliso 23 450-467) that separate *B. ciliatus* and *B. richardsonii* doesn't work throughout their range. This author has measured many plants. Some plants that had long anthers look identical to plants that had short ones. He found the length of 2<sup>nd</sup> glume of both species on the same plant. A number of plants from various places, this author will call *B. richardsonii* in its purest form even though that name may represent some other taxon. *B. porteri* most likely is found in the area of this treatment. It has the 1<sup>st</sup> glume mostly 3-nerved and the lemma is ± uniformly hairy.

- 1 Lemmas often lacking awns or with an awn-tip only 1-2 mm long, rarely longer; plants forming large patches because of rhizomes. . . . . *B. inermis*  
 1 Lemmas with fairly well developed awns; plants not forming patches  
 3 Awns attached at least 1.5 mm or more below the tip of the lemma (measured on the upper most florets in a spikelet)  
 4 Lemma teeth at least 1 mm long, mostly aristate-like  
 5 Panicle branches normally drooping; spikelets normally shorter than the branches of the inflorescence. . . . *B. tectorum*  
 5 Panicle branches ascending to erect; spikelets longer than the branches of inflorescence. . . . . *B. rubens*  
 4 Lemma teeth less than 1 mm long and not aristate-like. . . . . *B. japonicus*  
 3 Awns attached 0-1 mm below tip of lemma  
 6 The apex of the spikelets not pointed toward the ground (not obvious on press plants)

- 7 The cilia on the paleas coarse, widely spaced, usually fewer than 15; lemmas strongly rounded. . . . . *B. commutatus*  
 7 The cilia on the paleas fine, closely spaced, usually well over 15; lemmas compressed, more so toward their end in (*B. carinatus*)  
 8 The rachilla joints often over 2.5 mm long moderately hairy; lemma awns at least 4 mm long. . . . . *B. carinatus*  
 8 The rachilla less than 2.5 mm long, densely hairy; lemma awns up to 3.5 mm long. . . . . *B. catharticus*  
 6 The apex of a good share of the spikelets pointed toward the ground  
 9 The hairs on the marginal 1/3 of the lemma fairly coarse; 2<sup>nd</sup> glume usually less than 10 mm long. . . . . *B. ciliatus*  
 9 The hairs on the marginal 1/3 of the lemma real fine; 2<sup>nd</sup> glume usually more than 10 mm long . . . . . *B. richardsonii*

***Bromus carinatus* H. & A.**

var. *marginatus* (Nees) Barkworth & Anderton (Plates 951a, b)

MOUNTAIN BROME. Frequent, below 10000 ft.; moist meadows, moist woods, open meadows associated with sagebrush. May-Aug. !Lehman Creek T13N R69E S7, \*Wheeler Peak Campground T13N R68E S11, †Baker Creek 736 134E 43 17 335N Clifton 41054.

***Bromus catharticus* Vahl (Plate 952)**

RESCUE GRASS. Infrequent, below 6500 ft.; pasture, weedy places; introduced from South America. \*Lehman Creek, Baker Ranch 750025E 4322005N Clifton 48852

***Bromus ciliatus* L. (Plate 953)**

FRINGED BROME. Fairly frequent, 6000-11000 ft.; open forest floors and along roads. Mid July-early Sept. \*Wheeler Peak Road T13N R69E S6, \*Snake Creek T12N R69E S6, †Snake Creek 746 410E 43 10 612N Clifton 41040. [].

***Bromus commutatus* Schrader (Plates 954a, b)**

MEADOW CHESS. Fairly frequent, below 7400 ft.; open slopes, waste places; introduced from Eurasia. This and *B. japonicus* often grow together. The Cedars T12N R67E S2, \*Strawberry Creek T14N R69E S20, !Lehman Creek T13N R69E S8.

***Bromus inermis* Leys. (Plate 955)**

SMOOTH or HUNGARIAN BROME. Frequent, below 10000 ft.; along roads and other often disturbed places; introduced from Europe. June-Aug. !Lehman Creek T13N R69E S8, \*Wheeler Peak Campground 733 204E 43 21 145N.

***Bromus japonicus* Thunb. ex Murr (Plates 956a, b, c)**

JAPANESE or MEADOW CHESS. Fairly frequent, below 8000 ft.; dry fields, open ground, waste places; introduced from Eurasia. Plate c shows the immature spikelet. †\*Baker Creek 739 744E 43 19 258N Clifton 49036.

***Bromus richardsonii* Link (Plates 957a, b)**

RICHARDSON'S BROME. Fairly frequent, 6000-10000 ft.; riparian, talus slopes, rocky places in open forests. Sometimes these plants don't produce anthers. Collection 42967 has a lot of the 1<sup>st</sup> glumes 3-nerved. Jun-Aug. †Snake Creek 738 211E 43 14 206N Clifton 42967, \*Big Spring Wash 738 964E 43 01 050N (NAD 83) Clifton 49042, †Decathon Canyon 736 590E 43 03 328N Clifton 42240.

***Bromus tectorum* L. (Plates 958a, b)**

CHEATGRASS, DOWNY CHESS. Frequent, below 11100 ft.; most any habitat, often in disturbed places and burns; introduced from Eurasia. Highland Ridge 734 548E 43 06 519N, \*Mt. Washington Road 732 545E 43 08 949N, !Lehman Creek T13N R69E S7.

**CALAMAGROSTIS Reed Grass**

- 1 Inflorescence rather loose and open. . . . . *C. canadensis*  
 1 Inflorescence fairly contracted  
 2 Awn straight 1-2.5 (3) mm long; callus hairs about 1/2 to as long as the lemma. . . . . *C. stricta*  
 2 Awn geniculate, 4.5-8 mm long; callus hairs about 1/3 as long as the lemma. . . . . *C. purpurascens*

***Calamagrostis canadensis* (Michx.) Beauv. (Plates 959a, b)**

CANADA or BLUEJOINT REED GRASS. Fairly frequent, 6500-10000 ft.; riparian, mesic, open woodland. There has been some varieties named, but some of them are not very convincing. Jul-Sep. \*Lehman Creek T13N R68E S11, †Baker Creek 738 904E 43 18 235N Clifton 42846.

***Calamagrostis purpurascens* R. Br. (Plate 960)**

PURPLE REED GRASS. Fairly frequent, 7600-12000; from rocky slopes in woodlands to open alpine slopes. A number of plants in the area of this treatment have 2-3 fertile florets at the bottom of the spike. !Branch of Lincoln Canyon T12N R68E S27, \*Wheeler Peak T13N R68E S11, !Pyramid Peak 733 900E 43 14 621N.

***Calamagrostis stricta* (Timm) Koeler**

var. *stricta*

NORTHER REED GRASS. Limited, 6000-8000 ft.; along creeks. Jun-Aug. \*Baker Creek 739 028E 43 18 589N Clifton 38408.

### CATABROSA

*Catabrosa aquatica* (L.) Beauv. (Plates 961a, b)

BROOK GRASS. Fairly frequent, 5700-9400 ft.; wet places. Jun-Aug. \*Baker Creek 738 212E 43 17 425N, \*Pole Canyon T13N R69E S28, †Lehman Creek T13N R69E S8, †Lehman Creek 737 617E 43 21 475N Clifton 48976.

### DACTYLIS

*Dactylis glomerata* L. (Plate 962)

ORCHARD GRASS. Frequent, below 8000 ft.; along roads, meadows; introduced from Eurasia. Jun-Aug. †Lehman Creek T13N R69E S8, \*Baker Creek \*Baker Creek 738950E 4318490N Clifton 48805.

### DANTHONIA Oatgrass

1 Spikelets 5-13, ± rounded in cross section; lemmas 6-9 mm long. . . . . *D. intermedia*  
1 Spikelets 1 or often 2, ± flattened in cross section; lemmas 9.5-13 mm long. . . . . *D. unispicata*

*Danthonia intermedia* Vasey (Plates 963a, b)

TIMBER OATGRASS. Fairly infrequent, 8800-10000 ft.; meadows. Jul-Aug. \*Wheeler Peak Campground T13N R68E S11, South Fork Baker Creek 737 360E 43 16 753.

*Danthonia unispicata* (Thurb.) Macoun (Plate 964)

ONE-SIDED OATGRASS. Fairly infrequent, about 9860 ft.; dryer parts of meadows. Normally this taxon has very hairy leaf sheaths, but these plants have glabrous leaf sheaths. The inflorescence is of this taxon. It was growing close to the preceding taxon, which would make one wonder what their relationship could be. Jun-Aug. \*Wheeler Peak Campground T13N R68E S11.

### DESCHAMPSIA

1 Panicle widely spreading. . . . . *D. cespitosa*  
1 Panicle contracted; culms slender. . . . . *D. elongata*

*Deschampsia caespitosa* (L.) Beauv. (Plates 965a, b)

TUFTED HAIR-GRASS. Frequent, 6700-11000 ft.; meadows. Jul-Sep. \*Lehman Creek T13N R68E S11, †Baker Creek T13N R69E S14.

*Deschampsia elongata* (Hook.) Benth. (Plate 966)

SLENDER HAIR-GRASS. Frequent, 5700-9000 ft.; moist places. Jun-Aug. \*Baker Creek T13N R69E S21, †Baker Creek T13N R69E S14.

### DISTICHLIS

*Distichlis spicata* (L.) Greene (Plate 967)

SALT GRASS. Fairly frequent. below 6400 ft.; wet, saline places. May-Sep. Baker Creek T13N R69E S14, Hamlin Valley T10N R70E S1, Snake Creek 746 047E 43 10 602N.

### ECHINOCHLOA

*Echinochloa muricata* (Beauv.) Fern.

var. *microstachya* Wieg. (Plates 968a, b)

MURICATE BARNYARD GRASS. Infrequent, below 5300 ft.; pond margins, ranches, waste places. Jul-Oct. \*Baker Creek Ranch T13N R70E S3, Caine Spring 755188E 4336118N Clifton 47295.

### ×ELYHORDEUM

×*Elyhordeum macounii* Barkworth & D. R. Dewey

MACOUN'S CROSS. Infrequent, below 6000 ft.; meadows along creeks in pasture land. †\*Lake Creek 760029E 4306700N

Clifton 49025

## ELYMUS

**Note:** The expanded genus *Elymus* as found below is somewhat fraught with problems in that *Eremopyrum*, *Hordeum*, *Taeniatherum* could as well be added to this genus. This genus has been played with by many, with a number of genera named (which is most likely justifiable), but when a number of genera are made they have to be strung throughout the family key, which seems very unproductive. They also hybridize with each other creating numerous plants that have been given names at various times. So, for convince sake, they have been put into one genus, which is also done by other workers. Some of the plants that are always supposed to have rhizomes sometimes don't.

- 1 Plants with nodal area bearing a purple band; old leaf bases fibrous. . . . . *E. juncea*
- 1 Plants not combing the above 2 characters
  - 2 Glumes awned, the awns at least 8 mm long, the body of the glume obvious or not
    - 3 Glumes with the body not obvious. . . . . *E. elymoides*
    - 3 Glumes with the body obvious
      - 4 Inflorescence nodding to drooping; mostly along irrigation ditches. . . . . *E. canadensis*
      - 4 Inflorescence ± erect, mostly in native habitat
        - 5 Awns flexuous, scabrous . . . . . *E. scribneri*
        - 5 Awns straight, smooth. . . . . *E. trachycaulus*
  - 2 Glumes awnless or with awns not longer than 8 mm
    - 6 Lemmas with awns at least 6 mm or longer
      - 7 Spikelets mostly 2 per node. . . . . *E. glaucus*
      - 7 Spikelets mostly 1 per node
        - 8 Spikelets hairy. . . . . *E. albicans*
        - 8 Spikelets evidently hairless
          - 9 Awns usually divergent; anthers 4-6 mm long. . . . . *E. spicatus*
          - 9 Awns mostly straight; anthers 1-2 mm long. . . . . *E. trachycaulus*
    - 6 Lemmas awnless or with awns less than 6 mm
      - 10 Rachis at the base of the spikelet twisted so that the glume exposes the mid-nerve of the lemma; glumes often subulate
        - 11 Spikes 7-12 mm broad; plants usually forming large clumps. . . . . *E. cinereus*
        - 11 Spikes usually less than 7 mm wide; plants not forming large clumps
          - 12 Plants widely creeping, often covering large areas, often of moist sites, often alkali. . . . . *E. triticoides*
          - 12 Plants most often tufted, not covering large areas, often of dryer sites and in clay. . . . . *E. salinus*
    - 10 Rachis at the base of the spikelet not twisted, glume covering the mid-nerve; glumes broader
      - 13 Glumes gradually tapering from below the middle and passing imperceptibly into an awn. . . . . *E. smithii*
      - 13 Glumes broader not tapering from below the middle
        - 14 Glumes blunt or broadly rounded at apex, sometimes with a short pointed cusp at tip
          - 15 The lowest spikelet usually far removed from the one above; plants often quite robust. . . . . *E. elongatus*
          - 15 The lowest spikelet approximate to the one above; plants not robust. . . . . *E. hispidus*
  - 14 Glumes acute to short awned
    - 16 Anthers 1-2 mm long; palea rounded at apex. . . . . *E. trachycaulus*
    - 16 Anthers 4-6 mm long; palea notched at apex
      - 17 Old leaf sheaths persisting in large clumps; stems wiry; rhizomes usually lacking. . . . . *E. spicatus*
      - 17 Old leaf sheaths not persisting in large clumps; stems more coarse; rhizomes usually present. . . . . *E. lanceolatus*

***Elymus albicans*** (Scribn. Sm.) Löve

WHITISH WHEATGRASS. Infrequent, below 8000 ft.; along roads. This taxon is said to be a cross with *E. lanceolatus* and *E. spicatus* producing fertile plants. In the area of this treatment it seems to be growing with *E. lanceolatus* along roads. \*Baker Creek 738 685E 43 17 595N.

***Elymus canadensis*** L. (Plate 969)

CANADA WILDRYE. Limited, below 5200 ft.; pasture land that had a number of native plants. Jun-Aug. \*Baker Creek Ranch T13N R70E S3.

***Elymus cinereus*** Scribn. & Merr. (Plate 970)

BASIN WILD RYE. Fairly frequent, below 8500 ft. openings in sagebrush and juniper, meadow margins. Jun-Aug. \*Baker Creek T13N R69E S29, North Fork Big Wash 743 061E 43 08 336N, Chalk Spring 738 254E 43 57 820N. [*Leymus c.* (Scribn. & Merr.)

A. Löve].

***Elymus elongatus*** (Host) Runem.

var. ***ponticus*** (Podp.) Dorn (Plates 971a, b, c)

TALL WHEATGRASS. Limited, below 6,000 ft.; along roads, fields; introduced from Eurasia. \*Cross Road T14N R70E S33.

[*Elytrigia pontica* (Podp.) Holub ssp. *pontica*, *Agropyron e.*(Host) Beauv., *Triticum e.* Host.

***Elymus elymoides*** (Raf.) Swezey

**Note:** There are plants that have the glumes like variety *brevifolius*, but grow in large caespitose clumps and have fairly dense hairs on the glumes.

a Glumes with some awns divided part way to the base. . . . . var. ***elymoides***

a Glumes with all awns entire

b Glumes mostly 4 per node. . . . . var. ***brevifolius***

b Glumes appearing to be more than 4 because the lowest florets also are some what like the glumes, because they are sterile

. . . . . var. ***californicus***

var. ***brevifolius*** (J. G. Smith) Dorn (Plates 972a, b)

LONG-LEAVES SQUIRRELTAIL. Frequent, 9000-10200 ft.; open wooded floors, openings in sagebrush. These plants have few stems, these often widely spreading. Jul-Aug. \*†Wheeler Peak Campground 733 174E 43 21 109N. [*E. e.* (Raf.) Swezey

ssp. *b.* (J. Smith) Barkworth, *Sitanion b.* J. G. Smith].

var. ***californicus*** (J. G. Smith) I. M. Johnst.

CALIFORNIA SQUIRRELTAIL. Infrequent, dry, open places. These plants often grow with many stems in a large caespitose clump. †Snake Creek 741 196E 43 11 300N Clifton 43021. [ssp. *c.* (J. G. Sm.) Barkworth]

var. ***elymoides***

SQUIRRELTAIL. Fairly frequent, 9000 ft.; open rocky slopes, openings in sagebrush. Jun-Aug. \*Lehman Creek T13N R69E S9.

***Elymus hispidus*** (Opiz) Meld.

a Inflorescence glabrous. . . . . var. ***hispidus***

a Inflorescence quit hairy. . . . . var. ***ruthenicus***

var. ***hispidus*** (Plate 973)

INTERMEDIATE WHEATGRASS. Infrequent, below 10,000 ft.; along roads, often in native habitat. This taxon has and is being used in seeding mixture. Since it is not native it should not be used as it invades native habitat; introduced from Europe, n. Africa !Lehman Creek T13N R69N S8. [*Agropyron intermedia.*, *Elytrigia I.* (Host) Nevski].

var. ***ruthenicus*** (Griseb.) Dorn (Plates 974a, b)

HAIRY INTERMEDIATE WHEATGRASS. This taxon is sometimes mixed in with the species or by itself. Along roads.

***Elymus junceus*** Fisch. (Plate 975)

RUSSIAN-WILD RYE. Limited, about 6185 ft.; along dirt roads. \*†The Troughs Road 733 552E 42 81 792N Clifton 43983.

***Elymus lanceolatus*** (Scribn. & Sm.) Gould

a Lemmas scabrous to villous. . . . . var. ***lanceolatus***

a Lemmas glabrous to scaberulous. . . . . var. ***riparius***

var. ***lanceolatus*** (Plates 976a, b)

DOWNY or THICKSPIKE WHEATGRASS. Fairly frequent, below, 9000 ft.; along roads. Used in seed mixes. This taxon is easily confused with the hairy form of *E. hispidus*. There are some plants that have the glumes fairly blunt-tipped which would make them *E. hispidus*, but the lower internodes between the spikelets are quite far apart. If they were not hairy they could qualify as *E. elongatus* var. *pontica*, but they aren't robust enough for that taxon. \*Baker Creek 738 685E 43 17 595N, !Baker Creek Road 741 515E 43 19 966N. [*Agropyron dasystachyum* (Hook.) Scribn.]

var. ***riparius*** (Scribn. & Sm.) Dorn (Plates 977a, b)

STREAMBANK WHEATGRASS. Infrequent, below 9000 ft.; moist places. \* Snake Creek 745 975E 43 10 578N Clifton 48832, †Dry Canyon 734 370E 43 61 553N Clifton 48908

***Elymus salinus*** M. E. Jones (Plates 978a, b)

SALINA WILD RYE. Spring Valley south of Baking Powder Flat. [*Leymus s.* (M. E. Jones) A. Löve]

***Elymus scribneri*** (Vasey) M.E. Jones (Plates 979a, b)

SCRIBNER'S WHEATGRASS. Frequent, 10000-11700 ft.; open rocky slopes, crevices. July-Aug. \*Pyramid Peak Saddle T13N

R68E S35, †Highland Ridge 734 750E 43 06 771N.

*Elymus smithii* (Rydb.) Gould (Plate 980)

WESTERN WHEATGRASS. †Snake Creek 745 908 43 10 619. [*Agropyron s.* Rydb., *Elytrigia s.* (Rydb.) A. Löve, *Pascopyrum s.* (Rydb.) A. Löve].

*Elymus spicatus* (Pursh) Gould (Plate 981)

BLUE BUNCHED WHEATGRASS. Frequent, below 8500 ft.; dry rocky slopes with sagebrush. The variety *inerme* occurs at random ± throughout the range of the species and most likely represents the variability within the species. \*Baker Creek 739 216E 43 18 721N, †Lehman Creek T13N R69E S8, †Baker Creek Road 741 515E 43 19 966N, Chalk Spring 738 254E 43 57 820N. [*Pseudoroegneria s.* (Pursh) A. Löve, *Agropyron s.* (Pursh) Scribn. & Sm., *A. s.* var. *inerme* (Scribn. & Sm.)].

*Elymus trachycaulus* (Link.) Shinn.

This taxon is extremely variable, most likely influenced by other taxa from this genus.

a Lemmas with awns 10-30 mm long. . . . . var. *subsecundus*  
a Lemmas awnless or with awns up to 6 mm long. . . . . var. *trachycaulus*

var. *subsecundus* (Link.) Gould (Plate 982)

SUBSECUND SLENDER WHEATGRASS. Infrequent, 5000-9000 ft.; riparian, streamside meadows. \*Baker Creek T13N R69E S22, †Lake Creek 760 026E 43 06 776N Clifton 41066. [ssp. *s.* (Link) A. & D. Löve].

var. *trachycaulus* (Plate 983)

SLENDER WHEATGRASS. Frequent, below 11000 ft.; open rocky slopes, open woodlands, meadows. June-Aug. \*Strawberry Creek T14N R69E S30, Baking Powder Flat 722 640E 43 01 620N Clifton 52113.

*Elymus triticoides* Buckley (Plate 984)

BEARDLESS WILD RYE. Frequent, below 8500 ft.; saline, alkaline, or fresh water meadows, often on the dry side. This is an extremely variable taxon and most like should have a number of varieties. May-Aug. \*Strawberry Creek T14N R69E S20, \*Spring Valley T13N R67E S33, †Snake Creek 745 381 43 10 669, Silver Creek 740557E 4337820N (NAD 83) Clifton 47090, north of North Millick Spring 725 270E 43 56 030 (NAD 83) Clifton 47195, \*Lehman Creek, Baker Ranch 750 025E 43 22 005N Clifton 48853. [*Leymus t.* (Buckley) Pilger].

## EREMOPYRUM

*Eremopyrum triticeum* (Gaertn.) Nevski (Plates 985a, b)

ANNUAL WHEATGRASS. Fairly Frequent, below 5500 ft.; along road, waste places; introduced from Russia. May-Jul. \*Baker T13N R70E S9, †Spring Valley 722 980E 43 35 700N Clifton 51265.

## ERIONEURON

*Erioneuron pilosum* (Buckl.) Nash (Plates 986a, b)

HAIRY WOOLYGRASS. Infrequent, below 7000 ft.; open rocky slopes. The Troughs 739 345E 42 79 462N Clifton 43884, Marble Wash 748470E 4369720N Clifton 48958

## FESTUCA Fescue

**Note:** The plants that are part of section *Festuca* often seem to have many different forms from one mountain range to another and sometimes even in the same range. The characters that separate some of the taxa overlap, thus making it almost impossible to separate the plants. It appears that one of the important diagnostic characters is the distribution of sclerenchyma tissue within the vegetative shoots. This needs to be done on fairly fresh material and at least at 40×. (Stephen J. Darbyshire & Leon E. Pavlick 2007). All said and done, essentially all keys to these plants are not very helpful. The key below may or may not mean anything. Throughout the range of this genus there are many plants that don't fit any of the named taxa or else the description of each taxon needs to be expanded to include a wider scope of each taxon. This author has yet to find a *Festuca* with a closed leaf sheath for any distance. *Festuca rubra* is supposed to be closed  $\frac{3}{4}$  of its length. The sheaths are so often the margins so rolled the margin of one side is completely hidden inside the other so there is no way that they could be closed.

- 1 Plants densely tufted, with numerous vegetative shoots, lacking rhizomes or stolons; lower leaf sheaths rarely hairy
- 2 Awns of lemmas at least 3 mm long. . . . . *F. idahoensis*
- 2 Awns of lemmas less than 3 mm long

- 3 Plants with the old leaf bases reddish, ± shredding on the prolonged stems that are in the ground; leaves fairly fine; spikelets greenish. . . . . *F. 'calcareous'*
- 3 Plants not combining the above characters
- 4 Plants mostly alpine dwarfs
- 5 The inflorescence with the lower part among the sterile shoots; the lower leaf sheaths bearing some hairs; spikelets greenish. . . . . *F. 'subalpina'*
- 5 The inflorescence mostly elevated above the sterile shoots; the lower leaf sheaths glabrous; spikelets dark purplish
- 6 The lower, mostly tan, inflated leaf sheaths the dominate part of the plant; leaves not as fine as the next; anthers at least 1 mm long, yellowish. . . . . *F. purpusiana*
- 6 The lower leaf sheaths not noticeable; leaves very fine; anthers less than 1 mm long, purple. . . . . *F. minutiflora*
- 4 Plants well below the alpine. . . . . *F. saximontana*
- 1 Plants loosely tufted to solitary, rhizomes present, sometimes stolons; the bottom leaf sheaths normally hairy, some or all hairs pointed downward. . . . . *F. rubra*

***Festuca 'calcareous'*** (Plates 987a, b)

LIMESTONE FESCUE. Rare, about 10560 ft.; rocky slopes. These plants essentially look like *F. edlundiae*, the characters are about the same. The only real difference is *F. edlundiae* grows in the high arctic. †Highland Ridge 736 107 4306435 Clifton 44525.

***Festuca idahoensis*** Elmer (Plate 988)

IDAHO FESCUE. Fairly infrequent, limited to the North Snake? 8000-10000 ft.; grassy openings in scrub. There are plants that have well developed cauline leaves, while others almost appear acaulescent. Some are green, some are glaucous or blueish. \*Big Canyon 740 670E 43 53 450N Clifton 52140.

***Festuca minutiflora*** Rydb. (Plate 989)

FEW-FLOWERED FESCUE. Infrequent, 10700-11600 ft.; turf on slopes and among boulders, turf meadows. There are some plants that may be influenced by the next taxon. Jul-Aug. †Johnson Lake 734 291E 43 13 830N, †Pyramid Peak Saddle T13N R68E S35, The Table 741 944E 43 52 615N (NAD 83) Clifton 47175.

***Festuca purpusiana*** (Plates 990a, b)

PURPUS' FESCUE. Infrequent, 10700-11500 ft.; open rocky slopes, turf among boulders. There are many forms of this taxon in the area of this treatment. Some of these forms appear to reflect genetic flow from *F. minutiflora*. Jul-Sep. \*Lehman Creek T13N R69E S8, \*Stella Lake 732 056E 43 20 237N, †Highland Ridge 734 750E 43 06 771N, †above Williams Canyon 733 590E 43 14 043N Clifton 36387. [*F. o. L. var. purpusiana* St.-Yves, *F. saximontana* Rydb. var. *purpusiana* (St.-Yves) Fred.].

***Festuca rubra*** L. (Plates 991a, b, c)

RED FESCUE. Fairly frequent, below 10000 ft.; meadows, seeps, and springs. Jul-Sep. †Lehman Creek T13N R69E S7, Baker Creek T13N R69E S14.

***Festuca saximontana*** Rydb. (Plate 992)

RYDBERG FESCUE. Fairly frequent, 6000-9500 ft.; open slopes, often with sagebrush. Jun-Jul. \*Wheeler Peak Road T13N R69E S6, †Snake Creek 741 196E 43 11 300N Clifton 43022. [*F. saximontana* Rydb. *Festuca ovina* L. Inflorescence. *rydbergii* St.-Yves].

***Festuca 'serpentina'*** (Plates 993a, b)

SUBALPINE FESCUE. Rare, about 10440 ft; turf close to small conifers. These plants are like *F. brachyphylla* var. *breviculmis* that is found in California. †Stella Lake 732 233E 43 20 449N Clifton 36258.

**GLYCERIA** Manna Grass

- 1 Spikelets 9-15 mm long; inflorescence branches strict. . . . . *G. borealis*
- 1 Spikelets 2.5-5 mm long; inflorescence branches spreading. . . . . *G. striata*

***Glyceria borealis*** (Nash) Batchelder

NORTHERN MANNA GRASS. Limited, about 5778 ft.; growing in a meadow in a small drainage that is from a pond. The Cedars 723 778E 43 12 678N Clifton 43928.

***Glyceria striata*** (Lam.) A. Hitchc. (Plates 994a, b)

FOWL MANNA GRASS. Frequent, throughout; meadows, springs and along streams. The plants that have been called *G. elata* fit well within the description of *G. striata* as set forth in floras of eastern US. In numerous populations the differences are obvious, but in others they are not. The plants that have been called *G. elata* grow with this taxon at the Lehman Creek site. \*Lehman Creek T13N R69E S8, †Baker Creek 740 414E 43 19 235N Clifton 40968. [*G. elata* (Lam.) A. Hitchc.].

## HILARIA

*Hilaria jamesii* (Torr.) Benth. (Plates 995a, b)

GALLETA. Fairly frequent, below 6500 ft.; sandy to gravelly slopes. \*Murphy Wash T10N R68E S15, Baker Creek T13N R69E S14, Coyote Canyon 742400E 4369655N. [*Pleuraphis j.* Torr.]

## HORDEUM

- 1 Plants perennial; auricles very short or lacking
- 2 Glumes averaging over 30 mm, the dominate part of the inflorescence . . . . . *H. jubatum*
- 2 Glumes averaging less than 30 mm long, not the dominate part of the inflorescence
- 3 Awns stiff, 6-12 mm long. . . . . *H. brachyantherum*
- 3 Awns with some of them flexuous, 15-25 mm long. . . . . *H. adscendens*
- 1 Plants annual; auricles usually well developed. . . . . *H. murinum*

*Hordeum adscendens* Kunth (Plate 996)

ASCENDING BARLEY. Quite infrequent, below 5500 ft.; meadows, pasture land. This taxon has been made a subspecies of *H. jubatum*, however since they say it is a cross between *H. jubatum* and *H. brachyantherum* it can not be a subspecies of one of the parents. \*†Lehman Creek, Baker Ranch 750 104E 43 17 176N Clifton 48855, Gandy Road 756 324E 43 31 852N Clifton 51292.

*Hordeum brachyantherum* Nevski

MEADOW BARLEY. Fairly frequent, below 7,000ft.; meadows and along streams. \*Highway 894 T13N R67E S23, Baker Creek T13N R69E S14, Hamlin Valley T10N R70E S1, Strawberry Creek T14N R69E S20.

*Hordeum jubatum* L. (Plate 997)

FOXTAIL BARLEY. Fairly frequent, below 10,400 ft.; may be expected in most any habitat. Jun-Aug. Lehman Creek T13N R69E S12, \*The Cedars T13N R67E S34, Hamlin Valley T10N R70E S1, \*Mt. Washington Road 732 545E 43 08 949N.

*Hordeum murinum* L. (Plate 998)

MOUSE BARLEY. Limited, below 6,000 ft.; waste places. This taxon has been treated as consisting of two or more species or subspecies, however in the field there is no visible difference. Often a single character or several measurable differences are used to separate this group. The correlation between even two of the six features used by various persons as distinguishing differences are quite often lacking in numerous plants. So trying to separate this group is pointless; introduced from the Mediterranean. \*Baker T13N R70E S9. [ssp. *glaucum* (Steudel) Tzvelev]

## LEUCOPOA

**Note:** In California they have gotten carried away with themselves and put this and the next into *Festuca* where they becomes a disconcerting feature.

*Leucopoa kingii* (S. Wats.) W. A. Webber (Plates 999a, b)

FALSE FESCUE. Fairly frequent, 6400-9500 ft.; rocky, grassy slopes in sagebrush scrub. These plants look more like a *Poa* than a *Festuca*. †Head of Lucky Boy Canyon 727 964E 43 29 736N Clifton 45211, Windy Canyon Ridge 9600 ft. Raymond Jandl, Deerhead Canyon 739323E 4352677N (NAD 83) Clifton 47271, †Miller Basin Wash 732290E 4342976N Clifton 48991.

## LOLIUM

*Lolium perenne* L. (Plate 1000)

PERENNIAL RYE GRASS. Limited about 67 ft.; disturbed places; introduced from Europe. Sacramento Pass Rest Area 733 058E 43 33 497N. [var. *multiflorum* (Lam.) Parnell].

## MELICA

- 1 Inflorescence appearing one-sided with the spikelets reflexed on capillary pedicels. . . . . *M. stricta*
- 1 Inflorescence not one-sided, strict or spreading. . . . . *M. bulbosa*

*Melica bulbosa* Geyer (Plate 1001)

WESTERN ONION GRASS. Fairly frequent, 6500-10300 ft.; openings in woodland, rocky slopes. May-Aug. \*below Stella Lake T13N R68E S11, !Burnt Mill Canyon T13N R69E S6.

*Melica stricta* Boland. (Plates 1002a, b)

NODDING MELIC. Very infrequent, about 7000 ft.; very rocky places. Jun-Aug. Kious Basin 744 850E 43 17 065N Clifton 51336.

### MUHLENBERGIA

- 1 Plants annual. . . . . *M. minutissima*  
 1 Plants perennial  
 2 Plants with an open inflorescence. . . . . *M. asperifolia*  
 2 Plants with a contracted inflorescence. . . . . *M. richardsonis*

*Muhlenbergia asperifolia* (Nees & Mey.) Parodi (Plate 1003)

COMMON SCRATCHGRASS, ROUGH-LEAVED or ALKALI MUHLY. Infrequent, below 7,000 ft.; wet spring out flows that are most often on the saline side. Jun-Aug. !Willow Patch Springs T15N R68E S36, \*Strawberry Creek T14N R69E S21, Hamlin Valley T10N R70E S1, !Lehman Creek Clifton 11724, †Snake Creek 747 360E 43 11 200N Clifton 41043.

*Muhlenbergia minutissima* (Steud.) Swallen (Plate 1004)

ANNUAL MUHLY. Limited, below 6,500 ft.; moist meadow margins that are along small streams. Jul-Sep. !Lehman Creek 745 193E 43 21 242N, \*Lehman Creek 745 152E 43 21 680N Clifton 52153.

*Muhlenbergia richardsonis* (Trin.) Rydb.

**Note:** These two taxa are treated as the same thing, which they most likely are, but they look so much different in appearance that they are maintained in this treatment.

- a Plants coarse, low; leaves curved once. . . . . var. *squarrosa*  
 a Plants fine textured, taller; leaves straight to slightly wavy. . . . . var. *richardsonis*

var. *richardsonis* (Plates 1005a, b)

MAT MUHLY. Infrequent, below 6400 ft.; wet meadows, margins of irrigation ditches. Jun-Jul. †Baker Creek 743 506E 43 20 124N Clifton 38411, \*Minerva 726 787E 43 00 254N Clifton 44570, †Baker Creek 739 740E 43 19 290N Clifton 49033.

var. *squarrosa* (Trin.) G. Clifton comb. nov.

COARSE MAT MUHLY. Rare, below 10,700 ft.; drier areas along streams, meadow margins, margins of escarpments in limestone rock, rocky slopes. This taxon is as much different from the species as are many other varieties. They don't even remotely look the same. This variety is about the only one in California. Jun-Sep. †Divide between South Fork Baker Creek and Timber Creek 737 854E 43 15 132N Clifton 42965.

### MUNROA

*Munroa squarrosa* (Nutt.) Torr. (Plates 1006a, b)

FALSE BUFFALO GRASS. Fairly frequent, below 6700 ft. mostly road margins in fine gravel. Jun-Sep. \*Highway 488 747 552E 43 21 996N.

### PANICUM

*Panicum capillare* L. (Plates 1007a, b)

OLD-WITCH GRASS. Infrequent, below 5600 ft.; lake shores, and moist roadside ditches. Jun-Sep. \*Pruess Lake T22S R19W S20, !Lehman Creek T13N R69E S12 Clifton 11724.

### PHALARIS

*Phalaris arundinacea* L. (Plates 1008a, b)

REED CANARY GRASS. Infrequent, below 7800 ft.; along streams. This is a native grass that often chokes the margins of water ways. Jun-Aug. \*branch of Lincoln Canyon T12N R68E S28.

### PHLEUM Timothy

- 1 Auricles sometime present on the upper leaves; ligules truncate, subentire, culms not bulbous at base. . . . . *P. alpinum*  
 1 Auricles never present; ligules subentire, obtuse, sometimes lacerate; culm bulbous at the base. . . . . *P. pratense*

***Phleum alpinum*** L. (Plate 1009)

MOUNTAIN TIMOTHY. Infrequent, 8000-11000 ft.; meadows. Jul-Aug. \*Johnson Lake T13N R68E S36, !Lehman Creek T13N R69E S7.

***Phleum pratense*** L. (Plate 1010)

TIMOTHY. Fairly frequent, below 8500 ft.; along road, meadows, riparian; introduced from Europe. Jun-Sep. Lehman Creek T13N R69E S8, !Burnt Mill Canyon T13N R69E S6, \*Timber Creek 738660E 4317380N Clifton 48847.

**PHRAGMITES*****Phragmites australis*** (Cav.) Steud. (Plate 1011)

COMMON REED. Limited, below 5,800 ft.; along slow moving streams and about seeps. Jul-Nov. \*Big Springs Creek T10N R70E S1.

**POA**

- 1 Plants annual to weekly biannual; second glume irregular along the upper margin . . . . . ***P. annua***
- 1 Plants perennial; second glume regular along the upper margin
  - 2 Florets mostly converted into dark purple bulb-lets; culm with bulb-like base. . . . . ***P. bulbosa***
  - 2 Florets normal, green; culm not bulb-like at the base
    - 3 Stems strongly compressed appearing 2-edged. . . . . ***P. compressa***
    - 3 Stems ± terete
      - 4 Plants strongly rhizomatous; leaf sheaths retrorse pubescent; ligules thickened. . . . . ***P. wheeleri***
      - 4 Plants not combing the above characters
        - 5 Lemmas with a tuft of cobwebby hair at the base (sometimes quit small)
          - 6 Plants in the alpine. . . . . ***P. glauca***
          - 6 Plants below the alpine
            - 7 The cobwebby hairs at the base of the lemma longer than the lemma when stretched to their full length; plants extensively spreading, forming dense sods. . . . . ***P. pratensis***
            - 7 The cobwebby hairs not as long as the lemma; plants may be decumbent and stoloniferous in some
              - 8 Inflorescence branches in pairs. . . . . ***P. leptocoma***
              - 8 Inflorescence branches with more than a pair of branches. . . . . ***P. palustris***
- 5 Lemmas lacking a tuft of cobwebby hairs at their base, sometimes remotely so
  - 9 Leaf sheaths closed for about ½ their length. . . . . ***P. cusickii***
  - 9 Leaf sheaths closed ¼ or less long
    - 10 Lemmas with fairly long hairs on the 3 main nerves; flowers mostly pistillate. . . . . ***P. fendleriana***
    - 10 Lemmas ± uniformly hairy across their lower back . . . . . ***P. secunda***

**Note:** This group of plants is very difficult because apomixis is often found in a number of the species. At high elevation there appear to be a number of hybrids which adds to the confusion. Therefore, any number of plants may not be completely identifiable. The plants that grow in the alpine are separated by very minor differences. In this area the plants look different, but the method of separation is totally bogus. A number of what they call subspecies that taxonomists have invented (numerous overlapping characters) are nothing but a contiguum of variation of a single species.

***Poa annua*** L. (Plates 1013a, b)

ANNUAL BLUEGRASS. Widely scattered, below 9500 ft.; meadows and seeps; introduced from Europe. \*Baker Creek 739 186E 43 18 826N Clifton 38358.

***Poa bulbosa*** L.

var. ***vivipara*** Koch (Plate 1014)

BULBOUS BLUEGRASS. Infrequent, below 9000 ft.; openings in sagebrush and other dry slopes; introduced from Europe. \*Baker Creek 738 396E 43 17 796N, !Baker Creek T13N R69E S29. [ssp. *vivipara* (Koeler) Arcang.].

***Poa compressa*** L. (Plates 1015a, b, c)

CANADIAN BLUEGRASS. Infrequent, below 9300 ft.; wet places that often dry early; introduced from Europe. June-Aug. \*Baker Creek T13N R69E S22.

***Poa cusickii*** Vasey var. ?

†Baker Creek 735 733E 43 16 750N Clifton 41014.

***Poa fendleriana*** (Steud.) Vasey (Plates 1016a, b, c, d)

MUTTON GRASS. Frequent, below 11500 ft.; most any habitat. Variety *longiligula* is a false name for these plants as the ligule can be only 1 mm long. This taxon is extremely variable throughout its range, most like some of the extremes needing names. Some plants have a contracted inflorescence, while others have them widely spreading. Some have the ligule short and hairy on the back, while others have the ligule long and smooth on the back. So this author, at this point in time recognize no varieties. April-July: \*Stella Lake T13N R68E S11, \*Wheeler Peak Campground Road T13N R69E S5, \*Wheeler Peak Campground T13N R68E S11, †Highland Ridge 734 750E 43 06 771N.

***Poa glauca*** Vahl (Plates 1017a, b)

GREENLAND BLUEGRASS. Fairly frequent, 10000-12000 ft.; open rocky slopes, alpine turf among boulders. (Plates 1012a, b, c) are just a strange form of this taxon. Jun-Aug. \*above Johnson Lake 733 669E 43 13 961N, †above Williams Canyon 733 631E 43 13 952N Clifton 36386, †Pyramid Peak 733 917E 43 14 746N. [*P. interior* Rydb.]

***Poa leptocoma*** Trin. (Plate 1018)

MARSH BLUEGRASS. Infrequent, 9000-10500 ft.; wet places. The differences between this and *P. reflexa* are overlapping making them hard to separate. Jul-Aug. \*†Wheeler Peak Trail 733 411E 43 21 754N, \*†Lehman Creek 733 167E 43 21 075N, †Stella Lake 732 403E 43 20 831N, †Baker Creek 734 400E 43 15 450N Clifton 41005.

***Poa palustris*** L.

FOWL BLUEGRASS. Rare, below 8000 ft.; riparian. This taxon has been reported for the Snake Range. May-Aug.

***Poa pratensis*** L. (Plate 1019)

KENTUCKY BLUEGRASS. Frequent, below 10500 ft.; riparian, meadows; introduced from Eurasia. Some plants are extremely robust when growing almost in water and seem to flower later than the ones in dryer parts of meadows, some also have a contracted inflorescence. May-Sep. \*Baker Creek 739 186E 43 18 826N, †Lehman Creek T13N R69E S8, †Baker Creek 735 733E 43 16 750N Clifton 41013.

***Poa secunda*** Presl

- a Basal leaves mostly withering before plants flower; ligule eciliate at apex . . . . . var. *secunda*  
 a Basal leaves ± green when plants flower; ligule ciliate at apex. . . . . var. *juncifolia*

var. *juncifolia* (Scribn.) G. Clifton comb. nov. (Plate 1020)

RUSH-LEAVED BLUEGRASS. Infrequent, below 11000 ft.; streambanks, moist meadows. May-Jul. [*P. ampla* Merr.].

var. *secunda* (Plates 1021a, b)

WESTERN BLUEGRASS. Frequent, below 11,500 ft.; most any habitat except wet places or deep forest floors. This is the most common grass in the alpine, sometimes getting only 9 cm tall. The only difference between the alpine form and *P. glauca* var. *rupicola* is the ligule is lacerate and not ciliate and the spikelets flatter in the latter. Apr-Aug. \*Lehman Creek T13N R69E S8, \*Burnt Mill Canyon T13N R69E S6, \*Pyramid Peak T13N R68E S35, †Highland Ridge 734 750 E 43 06 771N, \*above Stella Lake 732 056E 43 20 237N, \*†Mt. Washington 733 895E 43 11 844N, †Pyramid Peak 733 917E 43 14 746N. [*Poa canbyi* (Scribn.) Howell].

***Poa wheeleri*** Vasey (Plates 1022a, b)

WHEELER'S BLUE GRASS. Frequent, 7000-10700 ft.; mesic saddles, meadows, ridge tops, open forests. May-Aug. \*†North Fork Big Wash 734 380E 43 08 984N Clifton 44531, †Decatheon Canyon 737 146E 43 00 933N Clifton 45229.

## POLYPOGON Beard Grass

***Polypogon monspeliensis*** (L.) Desf. (Plate 1023)

ANNUAL BEARDGRASS, RABBIT'S FOOT BEARDGRASS. Infrequent, below 6500 ft.; moist to wet places; introduced from Europe. May-Nov. \*Big Springs Valley T10N R70E S1.

## PUCCINELLIA

- 1 On any given clump of plants the flag leaves at least 3 cm long  
 2 The mid nerve of the lemma not real obvious, never reaching the apex, lemmas rarely 3.5 mm long. . . . . *P. nuttalliana*  
 2 The scabrous mid nerve of most of the lemmas reaching the apex, some lemmas at least 4 mm long. . . . . *P. cross*  
 1 On any given clump of plants the flag leaves less than 3 cm long  
 3 Lemmas usually 3.5-4 mm long, the scabrous mid nerve reaching the apex. . . . . *P. lemmonii*  
 3 Lemmas less than 2.2mm long; the mid nerve not as above. . . . . *P. distans*

**Note:** Often any combination of the below taxa can grow together and often show up on the same sheet. Most likely these species are just a contiguum of variation within a single polymorphic taxon. All their characters essentially overlap and numerous

plants have characters of two taxa. The branches only become spreading when the fruit is mature.

***Puccinellia*** cross

These plants look identical to *P. nuttalliana*, but have the lemmas with the mid nerve scabrous to the apex like *P. lemmonii* which was growing near by. Spring Valley 720 890E 43 39 240N Clifton 51263.

***Puccinellia distans*** (L.) Parl. (Plates 1024a, b)

EUROPEAN ALKALI GRASS. Limited, below 6000 ft. ; wet or dry places that are  $\pm$  alkali; introduced from Eurasia. The plants at the Cedars are a cross between this and *P. nuttalliana*. They have the flag leaf short, but right next to the inflorescence and the leaf system like *P. nuttalliana*. The plants at Snake Creek have the short flag leaf well below the inflorescence. Jul. \*The Cedars T12N R67E S2, Snake Creek 746050E 4310612N Clifton 45662.

***Puccinellia lemmonii*** (Vasey) Scribn. (Plates 1025a, b)

LEMMON'S ALKALI GRASS. Infrequent, 4000-7000 ft.; springs that are  $\pm$  alkali. May-Aug. †Spring Valley 720 890E 43 39 240N Clifton 51264, north of North Millick Spring 725350E 4356070 (NAD 83) Clifton 47192.

***Puccinellia nuttalliana*** (Schultes) A. Hitchc. (Plates 1026a, b)

NUTTALL'S ALKALI GRASS. Limited, about 4880 ft.; fairly wet grassy areas. Some say that the distinction between this taxon and *P. distans* is rather tenuous. Jun-Sep. Spring Valley 720 890E 43 39 240N Clifton 51264.

**SCHEDONORUS** False Fescue

- 1 Ligules almost entire; auricles glabrous. . . . . ***S. pratense***  
 1 Ligules deeply dentate; auricles ciliate. . . . . ***S. arundinaceum***

***Schedonorus arundinaceum*** (Schreb.) Dumort. (Plates 1027a, b)

TALL FALSE FESCUE. Fairly infrequent, below 5500 ft.; somewhat moist waste places, pastures; introduced from Europe. May-Jul. \*Lehman Creek, Baker Ranch 750 104E 43 17 176N Clifton 48856. [*Festuca a.* Schreb.].

***Schedonorus pratensis*** (Huds.) Beauv. (Plates 1028a, b)

MEADOW FESCUE, ENGLISH BLUEGRASS. Fairly frequent, below 10000 ft.; meadows, along roads, other most places; introduced from Europe. Jun-Aug. Baker Creek T13N R69E S22, \*Wheeler Peak Campground T13N R68E S11, Gandy Road 756 324E 43 31 852N Clifton 51293. [*Festuca p.* Huds.]

**SECALE** Rye

***Secale cereale*** L. (Plate 1029)

CULTIVATED RYE. Infrequent; limited to Snake Valley; waste places, sometimes invading native habitat; introduced from southwest Asia. May-Aug. Garrison 757235E 4313383N, Baker.

**SETARIA**

***Setaria viridis*** (L.) Beauv. (Plates 1030a, b)

GREEN BRISTLE FOXTAIL. Infrequent, below 6000 ft.; along road margins, in towns; introduced from Europe. Jun-Sep. \*Cross Road T14N R70E S33.

**SPARTINA**

***Spartina gracilis*** Trin. (Plates 1031a, b)

ALKALI CORD GRASS. Locally frequent, below 5600 ft.; alkaline meadows. Jun-Sep. \*Hamlin Valley T10N R70E S1, †The Cedars 723 809E 43 12 600N Clifton 40946.

**SPHENOPHOLIS**

***Sphenopholis obtusata*** (Michx.) Scribn. (Plate 1032)

PRAIRIE WEDGESCALE. Infrequent, below 7500 ft.; wet to moist meadows, seeps. Jul-Sep. \*The Cedars T12N R67E S2, \*Big Springs Creek T10N R70E S1, †Snake Creek 746 410E 43 10 612N Clifton 41039.

**SPOROBOLUS** Dropseed

- 1 Inflorescence open, spikelets ± at the tips of the branches; collar glabrous. . . . . *S. airoides*  
 1 Inflorescence ± contracted, spikelets to near base; collar densely hairy. . . . . *S. cryptandrus*

***Sporobolus airoides*** (Torr.) Torr. var. *airoides* (Plate 1033)

ALKALI SACATON. Frequent, below 5700 ft.; dry alkaline flats and meadows. May-Oct. \*Spring Valley T13N R67E S33, Hamlin Valley T10N R70E S1, Snake Creek 476 052E 43 10 600N.

***Sporobolus cryptandrus*** (Torr.) A. Gray (Plates 1034a, b)

SAND DROPSEED. Fairly frequent, below 7800 ft.; mostly along roads, limestone crevices. A number of plants in this area have the inflorescence enclosed in the leaf sheath. Jun-Aug. !Cross Road T14N R70E S33, \*Highway 894 T13N R67E S22, !Lehman Creek Clifton 11727, Snake Creek 739 873E 43 11 632N Clifton 47306.

**STIPA** Needle Grass, Indian Rice Grass

**Note:** There may well be several genera reflected in this group of plants, but since they look the same in their general appearance, tradition is here followed. The plants that used to be in the genus *Oryzopsis* are included herein.

- 1 Awns no longer than 11 mm, soon drooping from the lemma  
 2 Inflorescence contracted. . . . . *S. exigua*  
 2 Inflorescence with at least some of the branches spreading  
 3 Glumes 5-9 mm long. . . . . *S. hymenoides*  
 3 Glumes 2.5-3.5 mm long. . . . . *S. divaricata*  
 1 Awns over 11 mm long, not early drooping from the lemma  
 4 The throat-margin of the leaf sheath densely pubescent, not including the collar  
 5 Lower segment of awn scabrous  
 6 Hairs of lemma 2-5 mm long. . . . . *S. parishii*  
 6 Hairs of lemma 2 mm or less long with the hairs at tip up to 3.5 mm long. . . . . *S. scribneri*  
 5 Lower segment of awn strongly plumose. . . . . *S. speciosum*  
 4 The throat-margin of the leaf sheath glabrous or with a few longer hairs, but not dense, not including the collar  
 7 The apex of lemma ending with 2 short teeth with the awn in between; lemmas often purplish at least in part  
 . . . . . *S. pinetorum*  
 7 The apex not obviously bifid; lemmas usually straw-colored  
 8 Lower segment of the awns shortly plumose. . . . . *S. nevadensis*  
 8 Lower segment of the awns hirtellous to almost glabrous  
 9 Palea generally greater than 3/4 as long as the lemma; tip of callus blunt; plants fairly short and quite wiry looking. . . . . *S. lettermanii*  
 9 Palea about half as long as the lemma; tip of callus sharp and usually curved; plants generally taller and not quite as wiry looking. . . . . *S. nelsonii*

***Stipa arida*** M. E. Jones (Plate 1035)

MORMON NEEDLEGRASS. Infrequent, 5500-6500 ft.; ledges of sandstone and limestone. \*†Red Ledges 736 438E 4283 033N Clifton 43980, Snake Creek 753 756E 43 11 790N, Marble Wash 743776E 4370184N.

***Stipa comata*** Trin. & Rupr.

var. *comata* (Plate 1036)

NEEDLE AND THREAD GRASS. Frequent, below 9700 ft.; open slopes, often with sagebrush. May-Jul. \*Snake Creek T12N R69E S9, Baker Creek T13N R69E S14, South Fork Baker Creek 737 668E 43 15 206N, Chalk Spring 738 254E 43 57 820N. [*Hesperostipa c.* (Trin. & Rupr.) Barkworth].

***Stipa divaricata*** (Trin. & Rupr.) Columbus & J. P. Sm. (Plates 1037a, b, c)

LITTLE-SEEDED RICEGRASS. Frequent, 7000-9200 ft.; rocky places, often in crevices. Jun-Aug. \*Wheeler Peak Road T13N R69E S6, \*branch of Lincoln Canyon T12N R68E S28, Snake Creek 741 496E 43 11 300N. [*Piptatherum m.* (Trin. & Rupr.) Barkworth].

***Stipa exigua*** (Thurb.) Columbus & J. P. Sm. (Plate 1038)

LITTLE RICE GRASS. Frequent, 8000-10000 ft.; open ground, open woods, moist mountain meadow. Jul-Sep. !Baker Creek T13N R69E S30, \*Snake Creek T12N R69E S6. [*Piptatherum e.* (Thurb.) Barkworth]

***Stipa hymenoides*** Roemer & Schultes (Plates 1039a, b)

INDIAN RICE GRASS. Fairly frequent, below 10500 ft.; on slopes and flats from desert scrub to subalpine (if planted). \*Mt. Washington Road 732 545E 43 08 949N, !Lehman Creek T13N R69E S8, Chalk Spring 738 254E 43 57 820N. [*Oryzopsis h.*

(Roemer & Schultes) Ricker, *Achnatherum h.* (Roemer & Schultes) Barkworth].

***Stipa lettermanii*** (Vasey) Scribn. (Plate 1040)

LETTERMAN'S NEEDLEGRASS. Infrequent, 6600-10000 ft.; open wooded slopes. This taxon is easily confused with *A. nelsonii*. July-Sep. \*Snake Creek T12N R69E S8, Cedar Spur 746 685E 43 14 383N Clifton 45308. [*Achnatherum l.* (Vasey) Barkworth]

***Stipa nelsonii*** Scribn.

var. *nelsonii* (Plate 1042)

NELSON'S NEEDLEGRASS. Frequent, 7000-9000 ft.; open slope in sagebrush, open woodland floors. Jun-Jul. \*Gray Cliff T13N R69E S22, †Baker Creek 736 134E 43 17 335N Clifton 41054. [*Achnatherum n.* (Scribn.) Barkworth, *S. columbiana* Macoun var. *n.* (Scribn.) St. John].

***Stipa nevadensis*** B. Johnst.

NEVADA NEEDLE GRASS. To be expected, 6000-10000 ft.; dry open slopes. June-Aug. [*Achnatherum n.* (B. Johnst.) Barkworth].

***Stipa parishii*** Vasey

var. *depauperata* M. E. Jones (Plates 1042a, b)

SMALL PARISH'S NEEDLEGRASS. Infrequent, below 6000 ft.; dry, open, rocky slopes. May-Aug. \*Baker Creek 7950 ft. Raymond Jandl, Coyote Canyon 739 870E 43 67 150N Clifton 48935, Devils Gate Canyon 744 556E 43 73 467N Clifton 48948. [*Achnatherum p.* (Vasey) Barkworth ssp. *depauperatum* (M. E. Jones) Barkworth, *S. coronata* Thurb. var. *depauperata* (M.E. Jones) A. Hitchc.]

***Stipa pinetorum*** M. E. Jones (Plates 1043a, b)

PINE NEEDLE GRASS. Frequent, 6000-10300 ft.; open sage brush slopes to openings in forest. Jun-Aug. †below Stella Lake 39° 00' 21.6" 114° 18' 46", \*Baker Creek 738 698E 43 18 045N, †Decathon Canyon 737 114E 43 00 299N Clifton 45232, †Saddle between Arch Canyon and Big Spring Wash 740 458E 43 021 23N (NAD 83) Clifton 49046. [*Achnatherum p.* (M. E. Jones) Barkworth].

***Stipa scribneri*** Vasey

SCRIBNER'S NEEDLEGRASS. To be expected, below 7200 ft.; dry open slopes. Jun-Aug. [*Achnatherum s.* (Vasey) Barkworth].

***Stipa speciosa*** Trin. & Rupr. (Plate 1044)

DESERT NEEDLEGRASS. Infrequent, below 6000 ft.; open, often rocky slopes. Apr-Jun. \*Standing Snake Pinnacle 7200 ft. Raymond Jandl, Hendrys Creek 751366E 4344530N Clifton 47291. [*Achnatherum s.* (Trin. Rupr.) Barkworth].

***Stipa thurberiana*** Piper (Plates 1045a, b)

THURBER'S NEEDLEGRASS. Infrequent, below 7000 ft.; low sagebrush, openings in pinyon-juniper woodland. May-Jun. \*†Baker Creek Road 741 430E 43 20 790N Clifton 51250, Rudolph Canyon Lee Eddleman, Kious Basin 744 600E 43 17 415N. [*Achnatherum t.* (Piper) Barkworth].

### TRISETUM Oat Grass

- 1 Lemmas awned..... *T. spicatum*  
1 Lemmas lacking awns..... *T. wolfii*

***Trisetum spicatum*** (L.) Richt. (Plate 1046)

DOWNY OAT GRASS, SPIKED TRISETUM. Frequent, 7000-13000 ft.; meadows, alpine turf, rocky slopes. July-Sept. \*Burnt Mill Canyon T13N R69E S6.

***Trisetum wolfii*** Vasey

WOLF'S OAT GRASS. Limited, about 10000 ft.; wooded meadow along streams. July-Sept. \*Lehman Creek T13N R68E S11, †Bald Mountain 733 211E 43 22 300N Clifton 42974.

### VULPIA

**Note:** This group of plants have been stuck back in the genus *Festuca* by some.

***Vulpia octoflora*** (Walter) Rydb.

var. *hirtella* (Piper) Henrard (Plate 1047)

HAIRY SIX-WEEKS FESCUE. Fairly frequent, below 7000 ft. sandy to gravelly slopes and flats. Apr-Jun. \*Big Wash T12N R70E S27, †Strawberry Creek 736 960E 43 27 253N Clifton 49002.

**POTAMOGETONACEAE** Pondweed Family

- 1 The leaves fastened to stem or fastened to the stipule below the middle, if above the middle than floating leaves generally present. . . . . *Potamogeton*  
 1 The leaves fastened to the stipule almost at the apex. . . . . *Stuckenia*

**POTAMOGETON**

*Potamogeton foliosus* Raf (Plate 1048)

LEAFY PONDWEED. Limited, below 6700 ft.; submersed in pond water. \*The Cedars T12N R67E S2.

**STUCKENIA** False Pondweed

**Note:** These look just like *Potamogeton*, the only difference is what is in the key to genera, not much!

- 1 Ligule less than 1 mm long; leaves widely spreading when drawn from the water. . . . . *S. pectinata*  
 1 Ligule 2+ mm long; leaves not spreading when drawn from the water. . . . . *S. filiformis*

*Stuckenia filiformis* (Pers.) Börner

var. *occidentalis* (J. W. Robb.) G. Clifton comb. nov.

WESTERN NARROW-LEAVED FALSE PONDWEED. Infrequent, 7500-9500 ft. in streams and lakes. Jul-Sep. Rock Spring, South Millick Spring 725216E 4353410N Clifton 46732.

*Stuckenia pectinata* (L.) Börner (Plates 1049a, b)

FENNEL-LEAF FALSE PONDWEED. Local, below 5600 ft.; slow moving streams and ponds: \*Big Springs Creek T10N R70E S1, \*The Cedars T12N R67E S2. [*Potamogeton p.* L.].

**SPARGANIACEAE** Bur-Reed Family

[Typhaceae by some]

**SPARGANIUM** Bur-Reed

*Sparganium eurycarpum* Engelm. (Plates 1050a, b, c)

var. *eurycarpum*

TRUNCATE-FRUITED BUR-REED. Rare, about 5767 ft.; marsh and pond margins, streams. In recent works no varieties were recognized (Kaul 2000). Blind Spring 724 798E 42 97 816N Clifton 51321.

**TYPHACEAE** Cattail Family**TYPHA**

- 1 Pistillate and staminate spikes separated by a naked area. . . . . *T. domingensis*  
 1 Pistillate and staminate spikes confluent with each other. . . . . *T. latifolia*

*Typha domingensis* Pers. (Plate 1051)

SOUTHERN CATTAIL. Local, below 6800 ft.; pond margins. Jul-Aug. \*Highway 50, Rest Area T15N R68E S35.

*Typha latifolia* L. (Plate 1052)

BROAD-LEAVED CATTAIL. Local, below 7300 ft.; very wet meadows, pond margins. Jun-Aug. \*Highway 50 T15N R68E S21, Lehman Creek 739 428E 43 21 851N.

**ZANNICHELLIACEAE** Horned-Pondweed Family**ZANNICHELLIA**

*Zannichellia palustris* L. (Plate 1053)

HORNED-PONDWEED. Limited, below 7000 ft.; flowing to standing water. May-Nov. \*The Cedars T12N R67E S2.

Plates 851-855a



Plate 851a *Yucca harrimaniae*



Plate 851b



Plate 852b



Plate 852a *Allium acuminatum*



Plate 852c



Plate 853b



Plate 853a *Allium atrorubens*



Plate 854a *Allium bisceptrum*



Plate 854b



Plate 855a *Allium nevadense*

Plates 855b-859a



Plate 855b



Plate 856a *Allium parvum*



Plate 856b



Plate 857a *Calochortus flexuosus*



Plate 858 *Calochortus nuttallii*



Plate 859a *Fritillaria atropurpurea*



Plate 857b

Plates 859b-864



Plate 859b



Plate 860a *Lloydia serotina*



Plate 861 *Zigadenus elegans*



Plate 860b



Plate 863b



Plate 862a *Zigadenus paniculatus*



Plate 863a *Zigadenus venenosus*



Plate 864 *Smilacina stellata*



Plate 862b

Plates 865a-869b



Plate 865b



Plate 865b *Sagittaria cuneata*



Plate 866 *Carex aquitilis*



Plate 867 *Carex aurea*



Plate 868a *Carex* 'bakeri'



Plate 869a *Carex bolanderi*



Plate 868b



Plate 868c



Plate 869b

Plates 870a-873c



Plate 870a *Carex buxbaumii*



Plate 870b



Plate 871a *Carex disperma*



Plate 871b



Plate 872a *Carex douglasii* pistillate



Plate 873b



Plate 873a *Carex elynoides*



Plate 872b staminate



Plate 873c

Plates 873d-877b



Plate 873d



Plate 874 *Carex hassei*



Plate 875a *Carex heteroneura*



Plate 875b



Plate 876b



Plate 877a *Carex microptera*



Plate 877b



Plate 8776a *Carex interior*

Plates 878-881c



Plate 878 *Carex nardina*



Plate 879a *Carex nebraskensis*



Plate 879b



Plate 880a *Carex nova*



Plate 880b



Plate 880c



Plate 881a, b *Carex occidentalis*



Plate 881c

Plates 882a-886a



Plate 882a *Carex parryana*



Plate 882b



Plate 883a *Carex pellita*



Plate 883b



Plate 884a *Carex pelocarpa*



Plate 885b



Plate 885a *Carex petasata*



Plate 884b



Plate 886a *Carex phaeocephala*

Plates 886b-888c



Plate 886b



Plate 886c



Plate 887a *Carex praegracilis*



Plate 887b



Plate 887c



Plate 888a, b *Carex pseudoscirpoidea*



Plate 887d



Plate 887e



Plate 888c

Plates 889a-892a



Plate 889a *Carex rossii*



Plate 889b



Plate 889c



Plate 889d



Plate 890a, b *Carex scirpoidea*



Plate 891b



Plate 891a *Carex scopulorum* var. *bracteosa*



Plate 892a *Carex* 'serpentina'

Plates 892b-897b



Plate 892b



Plate 893 *Carex simulata*



Plate 894a *Carex stramineiformis*



Plate 895a *Carex subfusca*



Plate 895b



Plate 894b



Plate 896 *Carex subnigricans*



Plate 897a *Carex tahoensis*



Plate 897b

Plates 898a-903b



Plate 898a *Carex vallicola*



Plate 898b



Plate 899a *Cyperus squarrosus*



Plate 901b



Plate 899b



Plate 900 *Eleocharis acicularis*



Plate 901c



Plate 901a *Eleocharis bolanderi*



Plate 902a *Eleocharis macrostachya*



Plate 902b



Plate 903a  
*Eleocharis palustris*



Plate 903b

Plates 904a-906d



Plate 904b



Plate 904a *Eleocharis parishii*



Plate 906a *Eleocharis rostellata*



Plate 906b



Plate 906c



Plate 905a *Eleocharis quinqueflora*



Plate 905b



Plate 906d

Plates 907a-910c



Plate 907a *Eleocharis* 'serpentine'



Plate 907b



Plate 907c



Plate 908 *Lipocarpha drummondii*



Plate 909a *Schoenoplectus acutus*  
var. *occidentalis*



Plate 909b



Plate 910a, b *Schoenoplectus americanus*



Plate 910c

Plates 911a-913



Plate 911a *Schoenoplectus pungens* var. *longispicatus*



Plate 911b



Plate 911c



Plate 911d



Plate 912b



Plate 912a *Scirpus microcarpus*



Plate 913 *Iris missouriensis*

Plates 914-921



Plate 914 *Sisyrinchium demissum*



Plate 915 *Sisyrinchium halophilum*



Plate 916 *Juncus arcticus*  
var. *balticus*



Plate 917 *Juncus bufonis*



Plate 918a *Juncus bufonis*  
var. *occidentalis*



Plate 918a



Plate 919b



Plate 919a *Juncus dudleyi*



Plate 920 *Juncus ensifolius*  
var. *brunnescens*



Plate 921 *Juncus ensifolius*  
var. *montanus*

Plates 922-928



Plate 922 *Juncus longistylis*



Plate 923 *Juncus mertensianus*



Plate 924 *Juncus nevadensis*



Plate 925 *Juncus torreyi*



Plate 926a *Luzula spicata*



Plate 927a *Triglochin concinna* var. *debilis*



Plate 928 *Triglochin maritima* var. *elata*



Plate 927b



Plate 926b

Plates 929-933

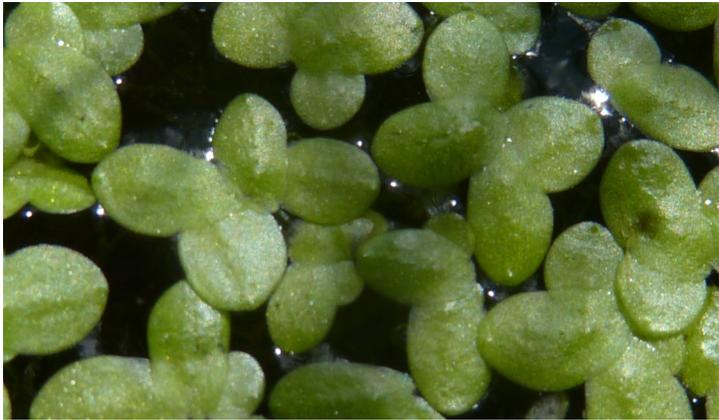


Plate 929 *Lemna minor*



Plate 930 *Lemna minuta*



Plate 931a *Lilaea scilloides*



Plate 913b



Plate 931c



Plate 932 *Corallorhiza maculata*



Plate 933 *Epipactis gigantea*

Plates 934-942a



Plate 934 *Listera convallarioides*



Plate 935a *Platanthera dilatea*



Plate 936a *Platanthera sparsiflora*



Plate 935b



Plate 937 *Spiranthes romanzoffiana*



Plate 936b



Plate 938  
*Agropyron desertorum*



Plate 939a *Agrostis exarata*



Plate 939b



Plate 941 *Agrostis humilis*



Plate 940 *Agrostis gigantea*



Plate 942a *Agrostis scabra*

Plates 942b-947a



Plate 942b



Plate 943a *Agrostis stolonifera*



Plate 943b



Plate 944a *Aristida glauca*



Plate 944 *Alopecurus aequalis*



Plate 945b



Plate 946 *Aristida longiseta*



Plate 947a *Arrhenatherum elatius*

Plates 947b-951a



Plate 947b



Plate 948a *Avena fatua*



Plate 948b



Plate 950 *Bouteloua gracilis*



Plate 949a *Blepharidachne kingii*



Plate 949b



Plate 951a *Bromus carinatus*  
var. *marginatus*

Plates 951b-957b



Plate 951b



Plate 952 *Bromus catharticus*



Plate 953 *Bromus ciliatus*



Plate 954a, b *Bromus commutatus*



Plate 955 *Bromus inermis*



Plate 956c



Plate 956a, b *Bromus japonicus*



Plate 957a, b *Bromus richardsonii*

Plates 958a-963b



Plate 958a *Bromus tectorum*



Plate 958b



Plate 959a *Calamagrostis canadensis*



Plate 959b



Plate 960 *Calamagrostis purpurascens*



Plate 961b



Plate 961a *Catabrosa aquatica*



Plate 963a, b *Danthonia intermedia*



Plate 962 *Dactylis glomerata*

Plates 964-970



**Plate 964** *Danthonia unispicata*



**Plate 965a, b** *Deschampsia caespitosa*



**Plate 966** *Deschampsia elongata*



**Plate 967** *Distichlis spicata*



**Plate 968a, b** *Echinochloa muricata* var. *microstachya*



**Plate 970** *Elymus cinereus*



**Plate 969** *Elymus canadensis*

Plates 971a-976b



Plate 971a *Elymus elongates* var. *ponticus*



Plate 971b



Plate 971c



Plate 972a *Elymus elymoides*  
var. *brevifolius*



Plate 972b



Plate 973 *Elymus hispidus*



Plate 975 *Elymus junceus*



Plate 974a, b *Elymus hispidus* var. *ruthenicus*



Plate 976a, b *Elymus lanceolatus*

Plates 977a-984



Plate 977a, b *Elymus lanceolatus*  
var. *riparius*



Plate 978a *Elymus salinus*



Plate 981 *Elymus*  
*spicatus*



Plate 979a *Elymus scribneri*



Plate 979b



Plate 978b



Plate 980 *Elymus smithii*



Plate 982 *Elymus*  
*trachycaulus* var.  
*subsecundus*



Plate 983 *Elymus*  
*trachycaulus*



Plate 984 *Elymus triticoides*

Plates 985a-991a



Plate 985a *Eremopyrum triticeum*



Plate 985b



Plate 986a *Erioneuron pilosum*



Plate 986b



Plate 987a *Festuca 'calcareous'*



Plate 988 *Festuca idahoensis*



Plate 987b



Plate 989 *Festuca minutiflora*



Plate 990a *Festuca purpusiana*



Plate 990b



Plate 991a *Festuca rubra*

Plates 991a-994b



Plate 991b



Plate 991c



Plate 993a *Festuca* 'serpentina'



Plate 992 *Festuca saximontana*



Plate 993b



Plate 994a *Glyceria striata*



Plate 994b

Plates 995a-1002a



Plate 995a *Hilaria jamrsii*



Plate 995b



Plate 996 *Hordeum adscendens*



Plate 997 *Hordeum jubatum*



Plate 998 *Hordeum murinum*



Plate 1000 *Lolium perenne*



Plate 999a *Leucopoa kingii*



Plate 999b



Plate 1001 *Melica bulbosa*



Plate 1002a *Melica stricta*

Plates 1002b-1006a



Plate 1002b



Plate 1003 *Muhlenbergia asperifolia*



Plate 1004b



Plate 1005 *Muhlenbergia minutissima*



Plate 1004a *Muhlenbergia richardsonis*



Plate 1006a *Munroa squarrosa*

**List of introduced weeds (80) (\* Known to be in the Park)**

*Acroptilon repens* RUSSIAN KNAPWEED  
 \**Agropyron desertorum* DESERT CRESTED WHEATGRASS  
 \**Agrostis stolonifera* REDTOP, CARPET BENT-GRASS  
 \**Alyssum desertorum* DESERT MADWORT  
 \**Alyssum simplex* FIELD MADWORT  
*Amaranthus albus* WHITE TUMBLEWEED  
*Amaranthus retroflexus* ROUGH PIGWEED or RED-ROOTED AMARANTH  
*Ambrosia artemisiifolia* COMMON RAGWEED  
*Arctium minus* LESSER BURDOCK  
*Arrhenatherum elatius* TALL OAT-GRASS  
*Artemisia biennis* BIENNIAL WORMWOOD  
*Atriplex rosea* RED SALTBUCH, TUMBLING ORACH  
*Avena fatua* WILD OAT  
 \**Bassia hyssopifolia* HYSSOP-LEAVED BASSIA, FOUR-HORNED SMOTHERWEED  
*Brassica elongata* ssp. *integrifolia* PERENNIAL MUSTARD  
*Bromus commutatus* MEADOW CHESS  
 \**Bromus inermis* SMOOTH BROME  
*Bromus japonicus* JAPANESE or MEADOW CHESS  
 \**Bromus tectorum* CHEATGRASS, DOWNY CHESS  
 \**Camelina microcarpa*. SMALL-FRUITED FALSE FLAX  
 \**Capsella bursa-pastoris* SHEPHERD'S PURSE  
 \**Carduus nutans* MUSK THISTLE  
 \**Centaurea micranthos* SPOTTED KNAPWEED  
*Centaurea virgata* VIRGATE KNAPWEED  
 \**Cerastium fontanum* ssp. *vulgare* LARGE MOUSE-EAR CHICKWEED  
 \**Ceratocephala testiculatus* PAIN-IN-THE-FINGER BUTTERCUP  
*Chenopodium glaucum* LEAFY GOOSEFOOT  
*Chorispora tenella* MUSK-MUSTARD  
 \**Cirsium arvense* CANADA-THISTLE  
 \**Cirsium vulgare* BULL THISTLE  
 \**Convolvulus arvensis* FIELD BINDWEED  
*Cynoglossum officinale* COMMON HOUND'S TONGUE  
 \**Dactylis glomerata* ORCHARD GRASS  
 \**Descurainia sophia* FLIXWEED, COMMON TANSY-MUSTARD  
 \**Elaeagnus angustifolia* RUSSIAN OLIVE  
 \**Elytrigia intermedia* INTERMEDIATE WHEATGRASS  
*Elytrigia elongata* var. *pontica* TALL WHEATGRASS  
*Eremopyrum triticeum* ANNUAL WHEATGRASS  
 \**Erodium cicutarium* RED-STEMMED FILAREE  
*Erysimum repandum* TREACLE MUSTARD, SPREADING WALLFLOWER  
 \**Halogeton glomeratus* HALOGETON  
*Hesperis matronalis* DAMES ROCKET  
*Hordeum murinum* MOUSE BARLEY  
*Kochia scoparia* SUMMER or MOCK CYPRESS  
 \**Lepidium perfoliatum* ROUND-LEAVED PEPPERGRASS  
*Linaria dalmatica* DALMATIA TOADFLAX  
*Lolium perenne* PERENNIAL RYEGRASS  
 \**Malva neglecta* DWARF MALLOW  
 \**Marrubium vulgare* HOARHOUND  
 \**Medicago lupulina* BLACK MEDIC  
 \**Medicago sativa* ALFALFA, LUCERNE  
 \**Melilotus albus* WHITE SWEET CLOVER  
 \**Melilotus officinalis* YELLOW SWEET CLOVER  
*Onobrychis viciifolia* SAINFOIN  
*Plantago major* COMMON PLANTAIN

*Persicaria maculata* LADY'S THUMB or SPOTTED SMARTWEED  
 \**Phleum pratense* TIMOTHY  
 \**Poa annua* ANNUAL BLUEGRASS  
 \**Poa bulbosa* var. *vivipara* BULBOUS BLUEGRASS  
 \**Poa compressa* CANADIAN BLUEGRASS  
 \**Poa pratensis* KENTUCKY BLUEGRASS  
 \**Polygonum aviculare* COMMON KNOTWEED, DOORWEED  
*Polygonum monspeliensis* ANNUAL BEARDGRASS, RABBIT'S FOOT BEARDGRASS  
*Populus alba* WHITE POPULAR  
 \**Puccinellia distans* EUROPEAN ALKALI GRASS  
 \**Rumex acetosella* SHEEP SORREL  
 \**Rumex crispus* CURLY LEAF DOCK  
*Salsola paulsenii* HAIRY RUSSIAN-THISTLE.  
 \**Salsola tragus* RUSSIAN-THISTLE, TUMBLE-WEED  
*Secale cereale* CULTIVATED RYE  
*Setaria viridis* GREEN BRISTLE FOXTAIL.  
 \**Sisymbrium altissimum* TUMBLE MUSTARD  
 \**Strigosella africana* AFRICAN MALCOLMIA  
*Tamarix ramosissima* BRANCHED SALT CEDAR  
 \**Taraxacum officinale* COMMON DANDELION  
*Tribulus terrestris* PUNCTURE VINE, CALTROP  
*Ulmus pumila* SIBERIAN ELM; CHINESE ELM  
 \**Verbascum thapsus* WOOLLY MULLEIN  
 \**Veronica biloba* BILOBED SPEEDWELL  
*Veronica catenata* PALE-FLOWERED or BROAD-FRUITED SPEEDWELL

## GLOSSARY

**acaulescent.** lacking a stem with leaves.

**achene.** dry indehiscent fruit, appearing as a seed.

**acuminate.** Long-tapered to a narrow tip, margins concave.

**acute.** sharp-pointed, margins straight to convex.

**adherent.** appearing to be fused (like or unlike parts) but separable.

**adnate.** fusing together of unlike parts, as in stamens and petals.

**alternate.** a single leaf per node or as stamens situated between petals.

**alveolae.** Honeycomb shaped pits.

**annual.** starting from seed in the ground to seed in the flower in one growing season.

**anther.** pollen-forming portion of a stamen.

**anthesis.** at time of flowering.

**apical.** at the tip or apex

**apiculate.** ended abruptly in a little point.

**apomixis.** the development of a plant without the normal sexual organs, no fertilization.

**appendage.** a supplementary or secondary part attached to anything.

**appressed.** anything that is parallel or nearly parallel to and often in contact with the surface from which it is attached.

**aquatic.** Plants of water, either under, partly above or floating.

**arachnoid.** entangled, soft hairs, cobweb-like.

**aristate.** bristle-like tip

**armed.** bearing anything that is pointed, inflicting pain.

**ascending.** curving upward, not straight.

**asymmetric.** one edge shaped differently from the opposite edge.

**atomiferous.** Having scattered sessile or subsessile glands.

**attenuate.** gradually long-tapered, very similar to acuminate.

**auriculate.** bearing ear-like appendages.

**auricle.** an ear-like appendage as in grass.

**awl-like.** object that is narrow throughout, but a little broader at the base and tapered to the tip.

**awn.** bristle-like appendage as on the lemmas of grass or pappus on the apex of the fruit in the Sunflower

family.

**axil.** upper angle between any appendage as in stem and leaves.

**axillary.** born in the axil as flowers inserted in the leaf axils.

**axis.** Anything that is the primary structure from which other things are attached.

**banner.** upper petal which is shaped differently than the other petals, often the largest, as in the Pea Family.

**barbed.** sharp backward-pointing projections.

**barbellate.** having barbs

**bearded.** having long stiff hairs.

**bell-shaped.** ± abruptly widening at the base and usually more gradually above as in fused petals.

**berry.** Seeds surrounded by the fleshy ripened wall of the ovary.

**biennial.** normally producing leaves the first year (basal rosette), flowering stem the next and then dying.

**bifid.** 2-lobed about to the middle, as in some petals and leaves.

**bipinnate.** leaflets on secondary branches of the leaf.

**blade.** The broadened part of

anything, as in leaves or petals; in the case of leaves they may be inrolled not looking like a blade.

**bract.** leaf-like structure that is small or scale-like which is limited to the inflorescence or a cone in the Pine Family, subtending a branch, a peduncle, a pedicel, a flower, or scales of a cone.

**bracteate.** having bracts

**bracteole.** small appendages between sepals, as in the Rose Family

**bractlet.** Secondary bracts that don't subtend any structure, these mostly on pedicels.

**bristle.** It is a catchall for many kinds of hair associated with most any part of the plant, as pappus bristles, bristles on fruit, bristles that take the place of the calyx in the Sedge Family, or bristles on the herbage of a plant.

**bud.** Any part of a plant which is still in the development state, as the end of a opening leaf, or before a flower opens.

**bulb.** Normally a swollen under ground stem with fleshy leaves or leaf bases around it in layers.

**bulbul.** Bulb-like structures either under ground or in the inflorescence, reproduction taking place without reproductive organs.

**bulbous.** Bulb-like at the base of stem but not a real bulb, as in some grasses.

**callus.** hard base of a floret, sometimes hairy, as in some of the grasses.

**calyx.** The first whorl of floral parts except for flowers where bracts take their place. All the sepals collectively.

**campanulate.** Shape of a bell

**canescent.** Hairs dense, fine, generally grayish white.

**capillary.** Very fine, long, hair like.

**capitate.** In a dense head

**capsule.** Fruit that is dry, often many-seeded, it almost always opens either by tearing, by pores, slits, or as a cap. (see circumscissile).

**caryopsis.** A dry, hard fruit in the grass family.

**catkin.** Spike of staminate or pistillate flowers with perianth inconspicuous and often conspicuous bracts, usually hanging down.

**caudex.** Where a vertical stem does major branching either below ground

or just at ground surface, often woody.

**cauline.** Leaves not at the base of a stem.

**cespitose.** Leaves densely tufted or cushion-like with the flowers held above.

**chaff.** Bracts that subtend the flowers in the Sunflower Family, they are usually papery or scaly.

**chamber.** Compartment or cavity within an ovary, capsule, or other hollow structures.

**chartaceous.** Papery in texture.

**chinks.** A narrow opening at the apex of anthers.

**ciliate.** Fringe of hair on the margins.

**cinereous.** Ash-colored

**circumscissile.** The top of a capsule falling away as a lid by a marked line of separation.

**claw.** The narrowing down of a petal into a stalk before reaching its point of attachment.

**cleft.** Cut for some distance, as styles cleft or leaf cut.

**cleistogamous.** Flowers that don't open and are usually self-pollinating.

**collar.** The area on the outer surface where the leaf and sheath come together in grasses.

**colonial.** A large stand of plants that are mostly attached to each other by stolons or rhizomes.

**column.** Structure at the center of a flower formed by the fusion of stamens and style, as in the Geranium Family.

**common.** Likely to be encountered.

**compound.** Any kind of structure that repeats its self, as compound leaf.

**compound leaf.** Speaking of any leaf division where the leaf margins are not attached to each other, if they are attached to each other they are lobed or dissected.

**compressed.** flattened front-to-back or side-to-side.

**concave.** The interior of a curve surface.

**cone.** Structure for reproduction, either woody, as in the Pine Family or  $\pm$  herbaceous, as in the Horsetail Family.

**confluent.** Two objects blending together.

**conic.** Object that has a 3-dimensional shape with a wide  $\pm$  round base, the side evenly tapered to a narrow point.

**connivent.** Coming together, but not fused.

**conspecific.** Two forms brought together to be the same thing.

**constricted.** Tightened together.

**continuous.** Parts spaced evenly in an uninterrupted line.

**convex.** The exterior of a curved surface that is rounded outward.

**cordate.** Leaf base heart-shaped.

**coriaceous.** Leather-like, tough.

**corm-like.** Is a short, thick, unbranched, underground stem.

**corolla.** The whorl of flower parts that is the next whorl above the calyx, which is composed of petals.

**corymb.** A simple, racemose inflorescence in which the outer pedicels are progressively longer than the inner which causes the inflorescence to a flat or rounded top.

**cotyledon.** A modified leaf present in the seed, often used for food storage. The leaf-like structure seen when seed first sprouts.

**crenate.** margins with shallow rounded teeth with the space in between acute.

**crest.** Appendage or ridge on top of.

**crisped.** Irregularly curled, as a margin of a leaf.

**culm.** Stem in a grass-like plant.

cylindric. Elongate and round in cross section at any point.

**cuspid.** A sharp rigid point.

**cuspidate.** Having a cusp.

**cyme.** Inflorescence that is branched and with the central or upper flower opening first, also true on side branches.

**deciduous.** Having leaves only during the growing season, gone during winter.

**decumbent.** Base of stem  $\pm$  laying on the ground with the tips curving up.

**decurrent.** The margin of a leaf that seems to continue down the stem upon which it is attached.

**dehiscent.** Anything that opens by

splitting at maturity to empty its contents.

**deltate.** A uniform triangle with basal corners rounded.

**dendritic.** Branched hairs that have an elevated stalk.

**dense.** Any thing that has many parts, compact or congested.

**dentate.** Having marginal  $\pm$  coarse, sharp teeth pointing outward, not upward.

**denticulate.** very finely dentate.

**depressed.** Center deeper than the margins.

**dicots.** A subgroup of plants having two cotyledons.

**diffuse.** Widely spreading

**digitate.** Like fingers from a central point.

**dilated.** Anything that is flattened and broadened.

**dimorphic.** Having object with one segment shaped one way and another segment shaped some other way.

**dioecious.** Having staminate plants and pistillate plants (male and female).

**diploid.** Having two complete sets of chromosomes in each cell.

**disarticulating.** Readily separating as one joint from another joint.

**discoid.** A receptacle in the Sunflower Family that has disk flowers only, lacking an outer row of pistillate flowers.

**disk.** A fleshy structure that often surrounds the base of the ovary or the receptacle containing disk flowers in the Sunflower Family.

**disk flowers.** In the Sunflower Family they are 5-(4) lobed corolla, normally with stamens and pistils (rarely sterile) inserted on the receptacle surrounded by an involucre or by a row of ray flowers.

**dissected.** A leaf that is irregularly, sharply, and deeply cut, but not to the main vein.

**distended.** Push out in size.

**distil.** At the far end, as at the far end of a leaf.

**divaricate.** Widely spreading at almost a right angle from point of attachment.

**divergent.** Spreading away at an ever increasing angle.

**dorsal.** Pertaining to the back side of anything.

**double serrate.** Margins with large serrations with intermediate smaller serrations.

**drupe.** A berry-like fruit that has a fleshy or pulpy surface that is covering a hard stone which encases the seed, as cherry fruit in the Rose Family.

**eciliate.** Lacking a fringe of hairs on the margin.

**elongate.** Drawn out in length.

**emarginate.** Notched at the apex.

**emergent.** Any part of a plant that is extended out of the water

**endemic.** Limited to a given area.

**entire.** Margins without any interruptions, i.e. serrate, dentate.

**epappose.** Lacking pappus

**erose.** Having the margins irregularly jagged.

**exceeding.** Extended beyond another structure tip-ward.

**excurrent.** Vein of a leaf or of a scale that extends beyond the tip as a narrow point.

**exserted.** Sticking out beyond, as stamens sticking out beyond the petals.

**falcate.** In the shape of a sickle.

**fascicle.** In a cluster or bundle.

**fibrous.** A root system composed of a number of roots that are tufted, about the same length and thickness.

**filament.** The stalk upon which the anther is born.

**filamentose.** Breaking into many thread-like strands.

**filiform.** Thread-like.

**fimbriate.** With a fringe of long or coarse hairs.

**fistulous.** Hollow stem or leaf (onion)

**fleshy.** Thick and juicy.

**flaccid.** Weak and limp, not stiff.

**flexuous.** Alternating curves.

**floccose.** Patches of soft woolly hair that are often easily rubbed off.

**floret.** A single flower that is a part of a spikelet in the Grass Family.

**floriferous.** Bearing many flowers.

**foliaceous.** Being like a leaf, as in a calyx being leaf-like.

**follicle.** A fruit that is a single cell that opens along the inner suture.

**free.** Not fused, separate, distinct.

**frond.** Usually referring to the leaf-like structure of a fern.

**fringed.** A margin that is jagged or finely cut.

**fruit.** A seed bearing structure.

**funnelform.** Narrow at the base and gradually widening upward to the throat.

**fused.** Fasten together.

**fusiform.** Both end long tapered with the center thicker.

**galea.** The upper 2 petals fused together forming a concave hood-like structure, as in the Figwort Family.

**geniculate.** Bent to one side.

**gibbous.** An abrupt swelling on one side, normally near the base.

**glabrate.** Nearly lacking hair.

**glabrescent.** Becoming hairless as a plant matures. **glabrous.** Lacking hair.

**gland.** 1. A round object that has a sticky substance either elevated on a hair or in a depression on a surface. 2. A depressed area close to the base on a petal. 3. Little irregular bumps on a petiole.

**glandular.** Having glands.

**glaucous.** slightly glaucous or becoming glaucous.

**glaucous.** Surface covered with a fine, waxy, removable powder which gives the surface a whitish or bluish hue.

**globose.** More or less like a ball.

**glochidiate.** Barbed at the tip.

**glomerate.** In dense clusters.

**glomerule.** compact head-like cyme or any dense, small cluster.

**glume.** Usually one of a pair of bracts that subtend a spikelet in the Grass Family.

**glutinous.** Sticky

**graduate.** distances small and regular

**granular.** Covered with small rounded bumps.

**gynophore.** A narrow projection that elevates the ovary above the flowers.

**habit.** The general appearance or manner of growth of a plant.

**habitat.** A setting in which a plant is found.

**hastate.** Shaped like an arrowhead, but with the lobes turned outward.

(compare sagittate)

**Head.** 1. A dense, somewhat rounded clump of flowers. 2. The complete flower structure in the Sunflower Family.

**herbaceous.** Not woody.

**hirsute.** Fairly stiff hairs of medium length.

**hirtellous.** Fairly stiff hairs that are shorter than hirsute.

**hispid.** Harshly stiff hairs, often prickly.

**hispidulous.** Small form of hispid.

**holotype.** A single sheet of a plant designated as the type by the original author.

**hyaline.** Thin, can see light through it.

**hypanthium.** A ring or cup around the ovary, either free from the ovary or partly or completely fused to it, it is composed of the fused parts of the calyx, corolla and the staminate part. The stamens appear to be attached to the calyx.

**imbricate.** A tight spiral arrangement of overlapping parts, loosely, shingle-like.

**incised.** Deeply and sharply cut, often irregularly so.

**included.** Completely within, not exposed.

**inheiscent.** Referring to a fruit that doesn't open.

**indurate.** Hardened.

**indusium.** An epidermal outgrowth or reflexed margin that covers the sori of many ferns.

**inequilateral.** Leaf blade fastened to the petiole at different elevations on each side.

**Inferior ovary.** An ovary with the other floral parts attached to a hypanthium which is fused with the ovary.

**inflorescence.** The arrangement of flowers on the stem, or flower cluster of a plant.

**infraspecific.** Lower in rank than specific, as subspecies or variety.

**innovations.** Nomenclatural changes.

**inserted.** Fastened to

**intergrade.** A plant that merges gradually from one extreme to another, usually by a series of intermediates.

**intermediate.** Between the extremes.

**internode.** The part of the stem between the nodes or joints.

**interrupted.** Unevenly spaced, usually referring to an inflorescence that has elongate spaces between the flowers.

**involucel.** A secondary involucre, as in the Carrot Family.

**involucre.** A set of bracts below a set of flowers.

**involute.** Rolled inward, so that the bottom surface is exposed and the upper concealed, opposite of revolute.

**irregular flower.** Where the petals (less often the calyx) are dissimilar in shape or orientation.

**isodiametric.** uniform in diameter, as uniform pits on a fruit.

**isotype.** A specimen that was collected at the same time as the type.

**keel.** A conspicuous longitudinal ridge; also the two partly united lower petals in some of the plants in the Pea Family.

**lacerate.** Torn, margin irregularly jagged.

**lacinate.** Margins cut into narrow and usually unequal segments.

**lanate.** Woolly.

**lanceolate.** Much longer than wide, widest below the middle, often tapering to both ends.

**lateral.** Referring to the sides of a structure.

**leaflet.** The ultimate unit of a compound leaf.

**lemma.** The outer and usually the larger bract that subtend the individual flowers in grass spikelets. (see palea)

**lenticular.** Shaped like an object that is double convex, as in the Sedge Family.

**ligule.** a tongue shaped object that is applied to: 1. an expanded corolla lobe (ray flower), as in the Sunflower Family. 2. to the appendage on the inner surface of a leaf at the junction of blade and sheath, as in many of the plants in the Grass Family. 3. to the extended

part of the hyaline part of the leafsheath that is opposite the leaf in the Sedge Family.

**linear.** Narrow and long with essentially parallel sides.

**lip.** 1. the two parts of an irregular corolla, as upper lip and lower lip, these lips are often lobed. 2 The expanded lower perianth segment in some plants in the Orchid Family.

**lobe.** That part of an organ which projects beyond, as lobes on a leaf or calyx and petal lobes on hypanthium.

**lodicules.** The very small scales at the base of each floret in the Grass Family that most likely represent the perianth.

**longitudinal.** Referring to the lengthwise dimension.

**lyrate.** lobed leaves the terminal lobe the longest and the laterals becoming progressively shorter towards the base.

**malpighiaecous hairs.** Hairs that are attached in the center, free at both ends and laying flat.

**membranaceous.** Thin and flexible.

**mesic.** Moist.

**monocarpic.** Normally referring to a perennial that blooms only once and then dies.

**monocot.** Any seed plant having a single cotyledon.

**monoecious.** Staminate and pistillate flowers on the same plant.

**montane.** The area between the foothills and the subalpine.

**mucro.** A short, sharp, slender point.

**mucronate.** Having a mucro at the tip.

**multicellular hair.** Hairs that are divided into cells by cross walls.

**nectary.** A gland that secretes nectar, usually toward the base of the petals, it is either open or sometimes partly covered by a flap, as in Buttercups.

**needle.** Generally referring to a narrowly linear, often waxy evergreen leaf, as in the Pine Family.

**node.** A point at which leaf-buds are attached to a stem or the stem branches.

**nut.** A dry fruit that is one seeded and inclosed in a hard shell.

**nutlet.** A small nut.

**ob-**. Used in Botany to mean the opposite position of any object or shape.

**oblique**. At an angle from vertical.

**obsolete**. Not evident.

**obtuse**. Rounded or blunt at the tip.

**orbicular**. Nearly round in shape.

**ovary**. The expanded basal part of the pistil containing the undeveloped seeds.

**ovate**. With the shape of a hen's egg on a flat plane.

**ovoid**. Shaped like a hen's egg in all respects.

**ovule**. The undeveloped seeds.

**palate**. The raised part of the lower lip of a 2-lipped corolla.

**palea**. The smaller of the bracts that enclose the individual flowers in the Grass Family.

**paleaceous**. Covered with thin scales or having thin scales.

**palmate**. Lobes or veins arise from a common point.

**palmatifid**. Palmately lobed or cleft.

**panicle**. A much branched inflorescence with each branch a raceme.

**pannose**. Felt-like

**papillae**. A short, round, blunt projection.

**papillate**. Having papillae.

**papillose**. Bearing minute rounded or swollen bumps.

**pappose**. Having pappus.

**pappus**. The crown, the bristles, the scales or a combination of these that are inserted on top of the fruit in many of the members of the Sunflower Family.

**parasite**. A plant that utilize energy or water at the expense of its host plant.

**parted**. Deeply cleft nearly to their base

**pectinate**. Like the teeth of a comb.

**pedicel**. The stalk holding a single flower.

**pedicellate**. Flowers having a pedicel.

**peduncle**. Normally referring to a stalk supporting several to many flowers.

**peltate**. A leaf with the petiole fasten on the under side about in the middle of the blade.

**pendulous**. hanging downward,

drooping.

**perennial**. A plant that lives for longer then two growing seasons. (see monocarpic)

**perfect**. Stamens and pistils present in the same flower.

**perfoliate**. A leaf base that surrounds the stem.

**perianth**. The calyx and petals or both.

**perigynium**. A special bract that encloses the achene of *Carex*.

**persistent**. Remaining fastened after normal function has been completed.

**petal**. One of the parts of the second floral whorl.

**petaloid**. Like a petal, especially in color and texture.

**petiolate**. With a petiole.

**petiole**. Stalk of a leaf

**phyllaries** a group of bracts surrounding the flowers in Asteraceae.

**pilose**. Hairs that are long, straight, quite soft, and spreading.

**pilosulose**. Having very small, soft straight hairs.

**pinnae**. The primary lateral divisions of pinnately compound leaf.

**pinnate**. A leaf that is once divided, the divisions divided to the rachis.

**pinnatifid**. A leaf that is pinnately cleft, but not to the rachis.

**pinnule**. The ultimate leaflet of a leaf that two or more times divided.

**pistil**. The female organ of a flower, normally composed of ovary, style, and stigma.

**pistillate flower**. A flower containing one or more pistils but no stamens.

**pitted**. Having small pits or depressions.

**plumose**. A hair-like structure from which radiate numerous fine hairs, feathery.

**pod**. A dry fruit that splits apart, especially a legume.

**polymorphic**. Taking on many forms.

**polyploid**. Having 3 or more chromosomes in each cell.

**pome**. A fleshy fruit that is derived from a modified floral tube, as an apple in the Rose Family.

**prickle**. A sharp outgrowth.

**primary**. First.

**prostrate**. Laying flat on the ground.

**pseudoperianth**. Referring to bracts that take the place of a perianth as in grass.

**Pseudopetiole**. A blade of a leaf that narrows down and looks like a petiole. Some of the leaves in the genus *Eryngium* never develops a blade-like structure.

**pseudoscape**. A false stem, as in some of the plants in the Carrot Family.

**puberulent**. Having fine, short, loose, curled hairs.

**pubescent**. Having hairs of any kind.

**pulverulent**. As if dusted with a fine powder.

**pulvinate**. Cushion-like.

**punctate**. Surface having colored dots, small depressions, or with translucent pitted glands.

**punctiform**. reduced to a mere point.

**pungent**. Ending in a sharp point.

**quadrangular**. Four sided.

**raceme**. A simple, long inflorescence with flowers on subequal pedicels, usually flowering from bottom toward the top.

**racemose**. Having racemes; raceme-like.

**rachilla**. The axis of a grass spikelet.

**rachis**. The axis of a spike or raceme or of a compound leaf.

**radiate**. 1. Spreading out from a central point. 2. In the Sunflower Family referring to the head that has marginal ray flowers.

**ray**. The first branch of an umbel; the strap-shaped corolla lobe in the Sunflower Family.

**receptacle**. 1. The object upon which floral parts are attached. 2. In the Sunflower Family it is the structure upon which flowers are attached.

**recurved**. Curved backward or downward

**reflexed**. Bent backward.

**regular**. Having the segments of the calyx and or the corolla the same in shape and size.

**remote**. Far from a point, distantly

spaced.

**reniform.** Much like cordate, except the tip is more rounded and the base is not as deeply concave.

**repand.** Margin undulating but not as strongly as sinuate.

**replum.** It is the partition that divides a fruit into 2 seed bearing compartments, as in the Mustard Family.

**resinous.** Having a varnished or glazed like surface, not real sticky.

**reticulate.** Being strongly net-veined.

**retorse.** Hairs that are bent backward or downward.

**refuse.** With a shallow notch at a round apex.

**revolute.** Margins rolled under, opposite of involute.

**rhizome.** It is an underground stem or rootstalk which connects 2 "plants" together.

**rhombic.** Diamond-shaped

**riparian.** Vegetation that grows along a stream or in and about any wet area.

**root.** That part of the plant which collects food from the ground.

**rosette.** A  $\pm$  flattened ring of leaves laying on the ground.

**rotate.** Having the parts spread out in a  $\pm$  flat plane like a wheel, as in some of the nightshade flowers.

**rotund.** Rounded in outline.

**rudiment** or **rudimentary.** Something that is poorly developed. (see vestigial)

**rugose.** Wrinkled.

**sac.** The cavity of an anther.

**saccate.** Like the shape of a bag or pouch.

**sagittate.** In the shape of an arrow with the two bottom lobes turned downward.

**samara.** A fruit that doesn't open that has wings, as in the Maple Family.

**saprophyte.** A plant lacking chlorophyll that lives on dead organic matter.

**scaberulous.** minutely rough

**scabrid.**  $\pm$  rough.

**scabrous.** Rough to the touch.

**scales.** 1. Any thin, scarious bract. 2. very small pappus atop achenes in the sunflower family. 3. Small leaves as in some of the junipers. 4. The bracts on

woody cones, as in the Pine Family.  
**scape.** A leafless peduncle in acaulescent plants.

**scapose.** Flowers born on a scape.

**scarios.** Thin, dry, soft, not green.

**scorpioid.** coiled like a scorpion's tail.

**scurfy.** Surface having small bran-like scales.

**secund.** One sided

**seed.** The part of a fruit which when planted will sprout.

**seep.** Moist areas where ground water comes to the surface.

**Segment.** A division or part of an object.

**sepal.** A segment of the calyx.

**septate.** Divided by a wall.

**septum.** A wall between cavities, as in an ovary.

**sericeous.** Silky with long, slender, soft hair that is  $\pm$  appressed.

**serpentine.** A greenish rock that is soapy when wet. As it weathers it becomes red and dirty.

**serrate.** Margin with forward pointing teeth.

**serrulate.** Minutely serrate.

**sessile.** Lacking a stalk, attached directly by the base, as a flower lacking a pedicel.

**sheath.** The basal part of a leaf that encloses the stem, as in the Grass Family.

**sigmoid.** S-shaped.

**silicle.** A silique that is less than twice as long as wide.

**silique.** A many seeded capsule of the Mustard Family, with the two valves splitting from the bottom and leaving the partition, normally over twice as long as wide.

**silky.** Cover with silk-like hair.

**simple.** 1. unbranched, as a stem. 2. not compound, as a leaf. 3. single part.

**sinuate.** Margin strongly wavy.

**sinus.** The open area between two lobes.

**smooth.** Not rough to the touch.

**solitary.** By ones self.

**sordid.** Dull or dirty hue.

**sori.** A number of sorus.

**sorus.** The fertile part of the fern frond.

**spathe.** Bract or bracts inclosing a flower cluster, as in the Iris Family.

**Spatulate.** A blade that is rounded above and gradually tapering to the base.

**spicate.** Flowers arranged in a spike.

**spike.** Sessile flowers or spikelets arranged on an elongate axis.

**spikelet.** A secondary spike, as in the Grass and Sedge Families.

**spine.** A long sharp pointed object which inflicts pain. 1. The end of branchlets. 2. Take the place of stipules. 3. At the end of involucre bracts, as in thistles.

**spinescent.** Somewhat spiny, often referring to a shrub which has branchlets  $\pm$  spiny at the tips.

**spinulose.** Having spine-like margins or tips.

**sporangium.** An object containing spores.

**spore.** A very small, single cell with thick walls, it is the reproductive body, as in the ferns.

**spurred.** Having a hollow extension of some part of the flower.

**stamen.** The male part of a flowering plant, composed of a filament and an anther.

**staminode.** A sterile stamen or taking the places of a stamen.

**stellate.** Hairs with 3 or more branches radiating from one point.

**sterile.** Lacking any functional sex organs.

**stipe.** 1. The stalk below an ovary. 2. The stalk of a fern frond.

**stipular sheath.** A stipule that forms a sheath around a stem, either open or closed.

**stipitate.** With a stalk, as stipitate-glandular.

**stipulate.** Bearing stipules.

**stipule.** One of a pair of appendages at the base of leaf petioles, these may be small to leaf-like in nature.

**stolon.** A stem that bends over and roots at the end forming a new plant, or creeping and rooting at the nodes.

**stoloniferous.** Having stolons.

**stone.** The part of the fruit that is hardened and bony which contains the seed.

**stramineous.** Straw-like as in texture and color.

**striate.** Having fine longitudinal lines or furrows.

**strict.** Erect, straight, not at all lax or

spreading.

**Strigose.** Surface with appressed straight, stiff hairs.

**strigulose.** In between strigose and pilose.

**style.** The stalk between the ovary and the stigma.

**submersed.** Mostly under water.

**subspecies.** Classification below the rank of species.

**subtend.** Below and close to an object.

**subulate.** Awl-shaped.

**succulent.** Holding water, fleshy.

**suffruticose.** Obscurely woody at the base, tending toward a shrub.

**suffruticose.** Woody, a small shrub.

**superior.** Elevated above, as an ovary that is free from the other floral organs.

**suture.** Identifying line of where fruits or anthers split apart or where there is any union of two parts.

**symmetrical.** Uniform in shape.

**synonym.** An outmoded systematic name or a name that applies to one that already has a name.

**taproot.** The central root from which all other originate.

**taxa.** 2 or more taxon.

**taxon.** Normally referring to any species, subspecies or variety.

**taxonomy.** Classification.

**tendrill.** A twining or coiling organ by which a plant clings to other plants.

**terete.** cylindrical in cross section.

**ternate.** In 3's, as a leaf that has 3 leaflets

**terrestrial.** Growing on the ground.

**Throat.** It is the area on a partly fused corolla that is between the tube and the limb.

**tomentose.** The surface having a covering of short, densely matted hair.

**tooth.** Any small marginal lobe.

**torulose.** Constricted between the seeds.

**transverse.** Across rather than length wise.

**tridentate.** Three toothed.

**trifid.** 3-cleft.

**trifoliate.** Having 3 leaflets.

**truncate.** End squared off.

**tub.** Referring to the fused part of a corolla or calyx.

**tuber.** A short, thickened root.

**tubercle.** A small warty swelling or a little tuber.

**tubular.** Shaped like a hollow cylinder.

**turbinate.** Shaped like a top, inversely conical.

**turgid.** Swollen.

**turion.** A wintering bud fastened to the roots

**umbel.** A flat or convex inflorescence with the pedicels arising from a common point at the end of a peduncle.

**uncinate.** Usually a hair that is hooked at the tip.

**undulate.** Wavy, but not as strong a sinuate.

**valve.** One of the segments into which a dehiscent capsule or pod separates.

**variety.** A subunit of a species.

**vascular plants.** Plants that have xylem and phloem.

**vein.** A vascular bundle that is obvious on the exterior of any surface.

**vernal.** Drying early in the season.

**ventral.** Opposite the back, usually that part of an object that faces something.

**verrucose.** Being warty.

**versatile.** An anther fasten to the filament near its middle.

**verticillate.** Being in a whorl.

**vestigial.** Reduced to a trace.

**villous.** Hairs long and soft, not matted, shaggy.

**vine.** A plant that is climbing upon or sprawling out on the ground.

**viscid.** Sticky.

**whorl.** A circular arrangement of like parts emanating from about the same spot.

**winged.** A membranous expansion attached to an organ.

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