

**A KEY TO THE FLORA OF FAIRVIEW  
MOUNTAIN FOR USE IN TEACHING**

by

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A KEY TO THE FLORA OF FAIRVIEW  
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INTRODUCTION

Plants of the state of Oregon have been described and listed in many different books and scientific periodicals. There is no local flora published, however, which contains all the Oregon species of flowering plants, and it would require quite a library of books on the subject to identify all of them.

Some parts of the state have been only partially explored botanically, and new species are still being discovered. There has been no satisfactory treatment of the subject for use in high schools. The thought behind this thesis is to set up a tentative plan with which schools can survey the plants of their localities. An attempt is made to identify the plants of a given area, realizing the fact that there may be additions, as the flora is explored more thoroughly. This contribution to the existing knowledge of plant life in the state would be a step in the direction of completing a floral survey of the entire state of Oregon.

A local flora has a very definite use. It simplifies the identification of plants and saves much time; time which would be consumed in searching through a great number of books on plants to find the one whose identity is desired. Failure to find a plant, because it is not described

in the book, often discourages beginning students of plant study.

A common name is given to each plant, where possible; this has a very definite retention value to high school students. Some of the selections of common names have been more or less arbitrary, but prime consideration is given to the most used local form.

All plants are given a scientific name. The name is always a binomial and is in Latin. These names are used for the purpose of uniformity, as common names may differ in each locality, or the name designated may mean an entirely different plant in another state. The scientific name follows the generic name. Thus our common dogwood is Cornus Nuttallii Aud. (genus, *Cornus*; species, *Nuttallii*; and Aud., the name of the man who established the species).

Each kind of a plant is called a species. Opinions differ among botanists as to the number of species in any given region. What one botanist considers to be a distinct species, another might regard as only a variety or form of another species. The definition given by Du Reitz is as follows: "Species are the smallest natural groups of individuals permanently separated from each other by a distinct discontinuity in the series of biotypes." In actual practice, any kind of a plant which is distinct enough to be recognized by a description is called a species.

The limits between species may be formed either by geographical or physiological isolation.

## CHAPTER I

### MAKING THE COLLECTION OF PLANTS

The student should be encouraged to make a representative collection of plants, as it focuses his attention and answers that latent urge to collect. Many people collect postage stamps, match covers, coins, etc. A well prepared herbarium makes a ready reference to materials at any time of the year and is a source of much pleasure to the person who has prepared it.

The first thing for the pupil to keep in mind is the selection of plants; they should represent species which are common. A collection of rarities is merely a curiosity. The ones which represent those one would be most likely to see on a field trip should be obtained.

Each plant collected should be as complete as possible. It should show all the parts of the plant, such as: the type of root, type of fruit, and the appearance of the basal leaves. Some families of plants are dependent upon these characters for identification. They would be difficult to identify if the roots or fruits were not present. In some plants the basal leaves differ from the stem leaves, and accurate determination would depend on having these present.

The best trowel for digging plants is one with a narrow blade, several inches wide, made of heavy tool steel,

with either a metal or a hard wood handle. The trowel must be made of strong material, as it will be used to dig in hard, rocky soils to obtain the roots of plants which are sometimes located at considerable depth.

The plants selected should be placed in a vasculum (field collecting can), which will serve as a temporary container for them on the trip. This is made of tin and may be any desirable size. It is usually cylindrical in shape. Plants will keep for several days in good condition in this type of container.

A portable field press is sometimes preferred to the vasculum. It is valuable if plants of a delicate nature are to be taken and the collecting is of a rather limited nature.

The laboratory press should be quite substantial. It can be made of 2 five-layer plywood boards 12 inches wide by 18 inches long. Cross strips are fastened 2 inches from each end. The ends of the cross sticks should be bored with a half inch bit, then notched. Bolts 12 inches in length should be purchased. Washers may then be welded onto wing nuts to fit these bolts. The pressure necessary can be determined by placing a foot or a knee on the press and tightening the screws until the desired pressure is obtained. With sufficient dryers and ventilators, one may fill such a press 10 inches or more high.



Notes should be made at the time of collection in the field notebook. Careful record should be kept of the following: field number, date, habitat, elevation, zone, formation, association, society, soil, exposure, height of plant, color of flower, odor, abundance, etc. The date which goes on the temporary label is taken from the notebook. These data should be in the folder with the plant during the time it is being pressed.

The folders are thin absorbent sheets of newspaper stock into which the plants are placed. They serve as temporary files for the storage of specimens. Old newspapers cut to the desired size, 12 by 18 inches when folded, make very satisfactory folders. The convenience of using folders is clearly evident during the changing of the press. If they were not used, it would be necessary to pick up the plant and transfer it to a new drying sheet.

The drying sheet should be of standard gray or white blotting paper made of felt with strong absorbent qualities.

Ventilators may be of corrugated cardboard or double surfaced strawboard. They afford the circulation of air in a press and hasten the drying process. They should be alternated with the absorbent drying sheets.

Before placing the specimens in the press, arrange them neatly in their proper places in the folders. Then place a ventilator and a dryer on the bottom of the press followed by the folder containing the plant and cover it

with a dryer and a ventilator. Continue this process until all of the plants have been taken care of; then tighten the clamps of the press and put it away in a warm place to dry.

When no artificial heat is used, it is well to change the driers every few days until the plants are thoroughly dry. Artificial heat is very convenient as the dryers do not require changing under this plan. An oil stove gives excellent satisfaction, as does an electric plant drier which can be constructed at very little cost.

After the plants are dried, they should be identified and mounted. The standard mounting sheet is 11 1/2 inches by 16 1/2 inches. A good quality heavy bristol paper or even an art board, which will withstand much handling, is recommended for use in schools. This will cost from 3 cents to 9 cents a sheet depending upon the quality, texture, and stiffness of the paper.

There are three ways that are commonly used to mount plants: first, the glue is painted on a glass plate, and the plant is laid on the plate, then it is transferred to the paper; second, the specimen is placed on the paper after it has been painted with a brush dipped in glue; and third, the specimen is placed on the mounting sheet and affixed by narrow strips of gummed tape.

Labels should be placed in the lower right hand corner of the herbarium sheet. Information for the permanent label will be obtained from the temporary label and the field

notebook. The label should contain the field number, scientific name, common name, date collected, name of collector, locality, etc.

The plants are now ready to be stored in the herbarium. The sheets of one genus are placed in a genus cover 17 by 24 inches, 17 by 12 inches folded, which is used for filing purposes. These covers are made of strong manila cardboard, on the lower left hand corner of which the name of the genus is written. The plants may be filed alphabetically in small collections or phylogenetically in the larger herbariums.

Some subsequent care is necessary, as dermestids, moths, and other pests will attack the specimens. Fumigation with carbon bisulphide is a recommended course. Padradichlor-benzine, naphthalene, ethylene dichloride, and carbon tetrachloride may be kept in the herbarium cases.

## CHAPTER II

## LIMITS OF AREA UNDER CONSIDERATION

Fairview Mountain was selected as the area, for it had not been surveyed previously. Collections were made there through a period of three summers. The area is located in the Bohemia district east of Cottage Grove. The mountain is a part of the Calapooyia range which runs east and west between the Cascade and Coast ranges. It is one of the highest mountains in this region reaching an altitude of 5970 feet.

The flora consists of plants coming from three different floral provinces. It has floral affinities with the Alaskan element, the Eastern Oregon element, and the Californian element. Wild flowers are very abundant in this area. Because of the high altitude, they do not reach their best until the middle of July, and they have a relatively short growing season.

All the plants listed in the Descriptive Flora were collected, pressed, mounted, labeled, and deposited in the Oregon State College herbarium.

The author's collection contains 259 species of plants in 166 genera and represents 50 families. The plants were collected over the entire limits of the area selected. The hope is that from 50 to 100 of them would be secured by the student. The pupil should collect his own specimens as

far as possible. He should study the structure of the flower and preserve them in the manner suggested in the text of this thesis. Knowledge of 100 plants would give the student a good grasp of plant forms, provided he does not stop with merely acquiring names and pressing specimens. The student should learn, among other things, floral relationships, associations, and to recognize plants in their habitats.

Table I shows the plant groups, families, genera, and species collected by the author on the Fairview Mountain area.

TABLE I  
Tabular Summary of Plants

Groups	Families	Genera	Species
Pteridophytes	1	7	7
Gymnosperms	3	7	9
Monocotyledons	5	27	43
Dicotyledons	<u>41</u>	<u>125</u>	<u>200</u>
Totals	50	166	259

## CHAPTER III

## ANALYTICAL KEY TO THE FAMILIES

PHYLUM PTERIDOPHYTA. Plants reproducing by spores

Spores borne on the surface of the leaves. 1. Polypodiaceae

PHYLUM SPERMATOPHYTA. Plants reproducing by seeds

Class Gymnospermae. Seeds not enclosed in an ovary,

usually borne on the face of a cone scale

Fruit red, one-seeded, berry-like or drupe-like.....

.....2. Taxaceae

Fruit a several-seeded cone

Leaves scale-like.....4. Cupressaceae

Leaves linear, fascicled or scattered along the

branch.....3. Pinaceae

Class Angiospermae. Seeds enclosed in an ovary

Subclass Monocotyledones. Leaves usually parallel  
veined, parts of the flower commonly in 3's, vas-  
cular bundles scattered throughout the stem, one  
seed leaf

Plants grass-like; flowers inconspicuous

Perianth none

Stems hollow, cylindrical; leaves two-ranked;

fruit a grain... ..5. Gramineae

Stems solid, usually three-angled; leaves three-

ranked; fruit an achene.....6. Cyperaceae

Perianth present, glume-like.....7. Juncaceae

Plants not grass-like; flowers generally showy

Ovary superior.....8. Liliaceae

Ovary inferior.....9. Orchidaceae

Subclass Dicotyledones. Leaves usually netted veined,  
parts of the flower commonly in 4's or 5's, vas-  
cular bundles arranged concentrically around a cen-  
tral pith, two seed leaves

Petals none

Trees and shrubs

Staminate and pistillate flowers both borne in  
catkins on the same plant

Fruit a woody cone.....10. Betulaceae

Fruit a berry.....32. Garryaceae

Staminate flowers only, borne in catkins on the  
same plant.....11. Fagaceae

Herbs

Ovary superior

Pistils many.....16. Ranunculaceae

Pistil one.....13. Polygonaceae

Ovary inferior; leaves large and heart-shaped..

.....12. Aristolochiaceae

Petals present

Petals free

Ovary superior

Stamens not borne on a disk or enlarged rim  
of the receptacle

Leaves palmately compound with three  
leaflets.....24. Oxalidaceae

Leaves not as above

Sepals 2.....14. Portulacaceae

Sepals more than 2

Plants with fleshy, very succulent  
leaves.....20. Crassulaceae

Plants with leaves not as above

Stamens indefinite in number.....  
.....16. Ranunculaceae

Stamens definite in number

Leaves alternate

Petals 4 arranged in the form of a  
cross.....19. Cruciferae

Petals not arranged in the form of  
a cross

Corolla irregular

Flowers with lower petal spurred  
at the base...29. Violaceae

Flowers papilionaceous.....  
.....23. Leguminosae

Corolla regular

Petals 6; stamens 6; anthers  
opening by uplifted valves..  
....17. Berberidaceae



Petals 5; stamens 5; anthers not  
as above...24. Linaceae

Leaves opposite

Stamens in groups; styles 3.....  
.....28. Hypericaceae

Stamens not as above

Small trees (in ours).27. Aceraceae

Herbs or shrubs

Evergreen shrub (in ours).....  
.....26. Celastraceae

Deciduous herbs

Pistils several, simple.....  
.....16. Ranunculaceae

Pistil one, compound.....  
.....15. Caryophyllaceae

Stamens borne on a disk or enlarged rim of the  
receptacle.....22. Rosaceae

Ovary inferior

Flowers in umbels.....31. Umbelliferae

Flowers not in umbels

Fruit a pome.....22. Rosaceae

Fruit not as above

Perianth parts in 5's (occasionally 4's)..  
.....21. Saxifragaceae

Not as above

Flowers in a head surrounded by showy  
petal-like bracts..33. Cornaceae

Flowers not in head, not as above, flow-  
er parts in 2's or 4's..30. Onagraceae

Petals united

Stamens more than five

Petals united at the base; or if united upwards,  
stamens 6

Stamens 6; sepals 2; petals 4 in 2 sets.....  
.....18. Fumariaceae

Stamens 10.....25. Oxalidaceae

Petals united into an urn-shaped tube.....  
.....34. Ericaceae

Stamens five or fewer

Ovary superior

Flowers regular

Pistils two.....39. Apocynaceae

Pistil one

Ovary 4-lobed, forming 4 seed-like nutlets  
.....40. Boraginaceae

Ovary not 4-lobed, not as above

Stamens opposite the corolla lobes.....  
.....36. Primulaceae

Stamens alternate with the corolla lobes

Leaves all basal..44. Plantaginaceae

Leaves not as above

- Styles 3-cleft at apex.....  
 .....38. Polemoniaceae
- Style not 3-cleft
- Plant glabrous..35. Gentianaceae
- Plant hairy...39. Hydrophyllaceae
- Flowers irregular
- Leaves alternate
- Parasites with scale-like leaves.....  
 .....43. Orobanchaceae
- Not as above, plants with green leaves....  
 .....42. Scrophulariaceae
- Leaves opposite
- Ovary 4-lobed, forming 4 seed-like nutlets  
 .....41. Labiatae
- Ovary a capsule, not as above.....  
 .....42. Scrophulariaceae
- Ovary inferior
- Plants mostly monocious...48. Cucurbitaceae
- Plants not as above
- Leaves alternate or basal
- Flowers bell-shaped...49. Campanulaceae
- Flowers involucrate and in heads.....  
 .....50. Compositae
- Leaves opposite or whorled
- Stamens united into a ring or tube around  
 the style.....50. Compositae

Stamens not united, not as above

Shrubs, erect or twining.....

.....46. Caprifoliaceae

Herbs

Flower parts in 4's..45. Rubiaceae

Flower parts not as above (Corolla  
five-lobed)....47. Valerianaceae

CHAPTER IV  
FLORAL DESCRIPTIONS

PTERIDOPHYTA. Ferns and Fern-allies.

Plants with two distinct, alternating generations. The leafy plant (sporophyte) reproduces by asexual spores borne in spore cases (sporangia) which give rise to a sexual thallus plant (gametophyte), which in turn bears the sexual reproductive organs. From this the leafy plant is developed.

1. POLYPODIACEAE. Fern Family

Herbs with divided or much lobed leaves (fronds). Sporangium minute, stalked, borne on the underside of the leaf lobe, usually in small clusters (sori); it may or may not have a covering (indusium). As the thallus plant is seldom collected, we are dependent upon the leafy plant (sporophyte) for the characters upon which classification is based.

Indusium present

Sori marginal, covered by the turned back portion of the leaf

Fronds of two kinds.....7. Cryptogramma

Fronds alike

Plants with fan-shaped leaves.....4. Adiantum

Plants with leaves not as above

Plants large and stout; stems usually solitary....

.....5. *Pteridium*

Plants small and slender; stems generally clustered

.....6. *Cheilanthes*

Sori not marginal, borne on the veins

Sori oblong, curved.....3. *Athyrium*

Sori round, peltate.....2. *Polystichum*

Indusium wanting.....1. *Polypodium*

### 1. *Polypodium* L.

Small ferns with pinnately-parted leaves and glabrous herbage. Sori roundish, dorsal. No indusia present.

1. *Polypodium glycyrrhiza* D. C. Eaton. Licorice fern.

Root very scaly; leaves thin, mostly distant, 7 to 12 inches long; stems usually shorter than the blades; lobes lanceolate, more or less curved, tapering to an acuminate apex; veins three-forked; sori distinct.

### 2. *Polystichum* Roth.

Leaves evergreen, coriaceous, tufted at the end of a stout rootstalk. Stems scaly. Leaflets with a lobe at the base on the upper side, teeth of the serrate leaflets spiny-tipped. Sori dorsal, round. Indusium fixed centrally.

1. *Polystichum munitum* (Kaulf.) Presl. Common sword fern. Leaves many, 1 to 4 feet long, simply pinnate; petioles stout and conspicuously chaffy; leaflets linear or lanceolate-linear, sharply serrate, auriculate at the base on the upper side; fruit dots abundant.

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3. *Athyrium* Roth.

Medium sized ferns, with once or twice pinnate leaves.

Fruit dots oblong or linear. Indusium superior, more or less curved, attached by one edge to the inner side.

1. *Athyrium Filix-femina* (L.) Roth. Lady fern.

Leaves deciduous, two to three pinnately compound; stems tufted; petioles straw-colored or brownish; leaflets lanceolate to oblong or linear; lobes crenate or variously incised; sori short-linear, curved; indusia sometimes toothed.

4. *Adiantum* L.

Slender ferns with creeping rootstalks. Leaves compound with highly polished, dark-colored petioles. Sori borne on the edge of the pinnules and covered by the back-turned margins or indusium.

1. *Adiantum pedatum* L. Var. *aleuticum* Rupr. Western maiden-hair fern. Leaves circular or roundish in outline; stalks dark brown or black, commonly highly polished; pinnae long-oblong, 2 to 8 inches long; leaflets incised above, lower margin entire; sori linear or moon-shaped.

5. *Pteridium* Scop.

Large, mostly coarse ferns with compound leaves. Fruit dots located on the margins. The indusium formed by the reflexed margin of the leaf.

1. *Pteridium aquilinum* (L.) Kuhn. var. *lanuginosum* (Bong.) Fernald. Western bracken. Rootstalk stout,

blackish, much creeping; stems 1 to 3 feet high, erect, pale green or yellowish; leaf blades 1 1/2 to 3 1/2 feet long, 1 to 3 feet wide, smooth above, pubescent beneath; the branches each bipinnate.

#### 6. *Cheilanthes* Sw.

Small rock-loving ferns with much divided leaves. Sterile and fertile leaves mostly alike. Sori marginal, borne near the end of the veins. Indusium formed by the incurving of the margins of the leaflets.

1. *Cheilanthes gracillima* D. C. Eaton. Lace fern. Tufted plants 3 to 7 inches high; petioles glossy brown, glabrous, bearing occasional small lanceolate scales; leaflets many, elliptic or ovate, glabrous above, densely pubescent beneath with brownish hairs.

#### 7. *Cryptogramma* R. Br.

Small ferns with two kinds of leaves, the narrow fertile ones taller than the foliaceous sterile leaves. Sori oblong or roundish, marginal. Indusium continuous, formed by the recurving margins of the leaflet, these meeting at the midrib, at length opening out flat.

1. *Cryptogramma acrostichoides* R. Br. American parsley-fern. Leaves bright green, blades of two kinds, sterile leaves shorter than the fertile ones, with ovate, crenate or incised leaflets; fertile leaves narrowly linear, margins reflexed to form a pod-like structure.



## SPERMATOPHYTA. Seed Plants

Plants without conspicuous alternating generations. The leafy plant (sporophyte) reproduces by ovules and stamens in which the gametophyte is so reduced as to be parasitic upon the leafy plant. The conspicuous leafy plant is composed typically of roots, stems and leaves. Plants produce seeds containing a young plant (embryo), which has a resting period until germination.

### CLASS GYMNOSPERMS. Cone-bearing Plants

Conebearing shrubs or trees, usually with leaves evergreen, narrowly-linear, needle-like, or sometimes awl-shaped or scale-like. Ovules borne on the face of the open scale. Stamens and ovules arranged in catkin-like clusters. Cotyledons several, usually more than two.

#### 2. TAXACEAE. Yew Family

Trees or shrubs with evergreen linear leaves, appearing 2-ranked. Flowers dioecious. Staminate flowers with filaments united into a column. Pistillate flowers of a single ovule, terminal on a short axillary branch. Fruit a bony seed surrounded by a fleshy disk.

##### 1. *Taxus* L.

Evergreen trees or shrubs. Leaves flat, linear, short-petioled, sharp-pointed, spirally arranged but appearing 2-ranked by a twist in the petioles. Staminate flowers consisting of a few scaly bracts and 4 to 8 stamens.

Pistillate flowers of several scales and a solitary erect ovule in the axis of a fleshy ring-shaped disk, which becomes cup-shaped, red, and surrounds the bony seed in the mature fruit.

1. Taxus brevifolia Nutt. Western Yew. A small tree 12 to 25 feet high with spreading or dropping branches and loose reddish bark; leaves linear, flat, abruptly sharp-pointed, 1/2 to 1 inch long, prominent midrib, shiny dark green above, lighter and somewhat glaucous beneath; staminate flowers globose, yellowish; pistillate flowers greenish; fruit bright red, berry-like.

### 3. PINACEAE. Pine Family

Trees or shrubs with alternate or clustered narrowly-linear leaves. Monocious, with staminate and ovulate flowers in different catkins on the same tree. Staminate catkins with spirally arranged stamens and each bearing two pollen sacs. Ovulate catkins with spirally arranged scales and each scale bearing two naked ovules at the base on the upper side. Seeds mostly winged, from the surface of the scale. Fruit a hard, woody cone.

Leaves in clusters, 2 to 5 in a bundle.....1. Pinus

Leaves solitary, opposite or whorled, scattered  
along the branch

Cones erect; scales deciduous.....3. Abies

Cones pendulous; scales persistent

Branches smooth; leaves persistent when dried,  
bracts exceeding the scales.....2. *Pseudotsuga*  
Branches roughened by the persistent leaf bases;  
leaves deciduous when dried, scales longer  
than the bracts.....4. *Tsuga*

#### 1. *Pinus* L.

Evergreen trees with leaves of two kinds. Leaves in bundles of 2 to 5 forming the ordinary foliage, arising from axils of reduced, scale-like leaves with deciduous tips. Staminate cones axillary, clustered at the base of new shoots. Ovulate cones woody, maturing the second year.

1. *Pinus monticola* Dougl. Western white pine. Tall, slender tree 75 to 150 feet high; trunk from 2 to 4 feet in diameter; bark is grayish-purple to cinnamon color, broken into peculiar small square blocks; needles are bluish-green with a whitish tinge, 2 to 4 inches long and borne 5 in a bundle; cones cylindrical, pendulous, 6 to 10 inches long, sometimes curved toward apex.

#### 2. *Pseudotsuga* Carr.

Evergreen trees with dense, soft, flat leaves, spirally arranged, sometimes giving a flat appearance by a twist in their petioles. Flowers monecious. Female flowers are bristly, scaly bodies, usually borne back from the ends of the twigs. Male flowers axillary or terminal. Cones pendulous maturing the first year, having

characteristic 3-pointed bracts protruding conspicuously beyond the cone-scales. No other native conifer has this characteristic.

1. Pseudotsuga taxifolia (Poir.) Britt. Douglas fir. Large tree 50 to 200 feet in height, 2 to 15 feet in diameter; bark from 5 to 24 inches thick, deeply furrowed; leaves 1/2 to 1 1/2 inches long, linear, soft, flat, pointed (not prickly) on tips, slightly grooved above, varying from yellowish-green to blue-green, paler on under side; cones 2 to 4 inches long, pendulous, the three-pointed bracts conspicuously exceeding the cone-scales.

3. Abies (Tourn.) Hill.

Tall evergreen trees. Leaves linear, sessile, flat or angled, appearing 2-ranked, or spreading in two opposite directions, leaving the branchlets with smooth circular leaf-scars upon falling. Cones borne erect, maturing in one year. Cone-scales deciduous from a persistent central axis. Bracts of the scale shorter than or exceeding it.

Leaves pale blue-green, with stomata

on the upper surface.....1. Abies concolor

Leaves lustrous dark green above, pale beneath, no

stomata on the upper surface.....2. Abies grandis

1. Abies concolor Lindl. and Gord. White fir. Large forest tree 60 to 200 feet high; 40 to 60 inches in diameter; bark in mature trees deeply furrowed, hard and rough,

from 3 to 5 inches thick, ashy-gray, in young trees smooth with a grayish-brown tinge; leaves flat,  $1/2$  to  $2\ 1/2$  inches long, straight, apex blunt or pointed, pale yellow-green with a whitish tinge on both sides; cones rounded at the top and bottom, oblong in shape, 3 to 5 inches long, pale olive-green to purplish.

2. Abies grandis Lindl. Lowland white fir. Large forest tree 40 to 160 feet high; 18 to 30 inches in diameter; bark in mature trees pale red-brown with an ashen tinge, deeply but narrowly furrowed, in young trees smooth ashy-brown with chalky areas; leaves shiny deep yellow-green above, all conspicuously white on the under surface, somewhat two-ranked in appearance, flat, 1 to 2 inches long, apex blunt, notched; cones rounded at top and bottom, cylindrical in shape,  $2\ 1/2$  to  $4\ 1/2$  inches long, dark or light yellow-green.

#### 4. *Tsuga* (Engl.) Carr.

Slender, evergreen trees with roughened branchlets and soft, linear leaves. Staminate catkins pendulous of a cluster of stamens rising from axillary winter buds. Ovulate catkins erect from terminal winter buds. Cones pendant, maturing the first year.

Leaves in flattened sprays; cones small,

$1/2$  to 1 inch long.....1. *Tsuga heterophylla*

Leaves spreading from all sides of the stem; cones larger,

$1\ 1/2$  to 3 inches long.....2. *Tsuga Mertensiana*

Cones oblong; scales oblong, imbricated;

leaves appearing to be in whorls of

four.....1. *Librocedrus*

Cones round; scales shield or wedge-shaped;

leaves in pairs.....2. *Chamaecyparis*

### 1. *Librocedrus* Endl.

Tall forest trees with spreading branches. Leaves scale-like, opposite, 4-ranked, the successive pairs dissimilar. Flowers monocious, terminal on separate branches. Staminate flowers oblong with 12 to 16 stamens, the ovulate oblong, composed of 4 to 8 acuminate scales, only one pair ovule bearing. The oblong cones are composed of imbricate scales and mature the first year.

1. *Libocedrus decurrens* Torr. Incense cedar. Large forest tree 50 to 200 feet high; trunk 2 1/2 to 5 feet in diameter; bark fibrous, loose, cinnamon-brown; leaves light green, opposite, scale-like, the acute tips spreading; cones 3/4 to 1 inch long, pendulous, reddish-brown, oblong.

### 2. *Chamaecyparis* Spach.

Trees or shrubs with flattened 2-ranked branches. Leaves scale-like, opposite in pairs, thickly clothing the branchlet. Flowers monocious, terminal. Staminate flowers small, globose, with many stamens, the ovulate sub-globose, composed of from 4 to 6 thick peltate scales bearing from 2 to 5 ovules. The globose cones are composed of shield-shaped scales and mature the first year.

1. Chamaecyparis nootkatensis (Lamb.) Spach. Alaska cedar. Tree 75 to 150 feet high; trunk 1 1/2 to 4 feet in diameter; bark deeply fissured, thin, pale grayish; leaves scale-like, small, acute, pointed, closely appressed; cones globose, reddish-brown, glaucous, with 4 to 7 scales.

#### ANGIOSPERMS. Flowering Plants

Ovules borne in an enclosed ovary. Plants with true flowers, typically with stamens and pistil, this surrounded by a protecting floral envelope. Cotyledons one or two.

#### MONOCOTYLEDONS.

Leaves usually parallel veined, parts of the flower commonly in 3's, vascular bundles scattered throughout the stem, one seed leaf.

#### 5. GRAMINEAE. Grass Family

Annual or perennial herbs. Stems hollow, terete, closed and enlarged at the nodes. Leaves alternate, 2-ranked with sheathing bases, which are split open on the opposite side of the blade. Flowers small, in spikelets which are arranged in panicles, racemes, or spikes. The flowers are nearly or quite destitute of floral envelopes, borne in scaly bracts called glumes, which are arranged in 2-ranks overlapping each other. Stamens 1 to 6, usually 3. Anthers versatile. Usually 2 styles with plumose stigmas. Fruit a grain.

## KEY TO THE TRIBES

Spikelets with one perfect flower.....Tribe 1. Agrostideae

Spikelets with several to many flowers.

Inflorescence a panicle

Glumes longer than the lemma; awn dorsal, bent and twisted.....Tribe 2. Aveneae

Glumes shorter than the lemma; awn apical and straight or none at all.....Tribe 3. Festuceae

Inflorescence a spike.....Tribe 4. Hordeae

## Tribe 1. Agrostideae

Glumes shorter than the lemma.....1. Muhlenbergia

Glumes longer than the lemma

Florets naked at the base or with short hairs.....2. Agrostis

Florets with hairs at the base at least half as long as the lemma; palea present.....3. Calamogrostis

## Tribe 2. Aveneae

Spikelets less than one-half inch long....4. Trisetum

Spikelets three-fourths inch or more long.5. Avena

## Tribe 3. Festuceae

Lemmas keeled on the back

Lemmas awned from a minutely two-toothed apex.....9. Bromus

Lemmas awnless; spikelets small not over one-half inch long.....7. Poa

Lemmas rounded on the back (slightly keeled toward the



summit in Festuca and some species of Bromus).

Glumes papery; upper florets sterile folded about each other.....6. Melica

Glumes not papery; upper florets perfect

Lemmas entire, awned from the tip or pointed.....8. Festuca

Lemmas awned from a minutely two-toothed apex.....9. Bromus

#### Tribe 4. Hordeae

Rachis continuous, not readily broken into joints; glumes entire.....10. Elymus

Rachis breaks apart at maturity into joints; glumes often parted.....11. Sitanion

##### 1. Muhlenbergia Gmel.

Perennial grasses with 1-flowered spikelets in close or rarely open panicles. Glumes 2, unequal, shorter than the lemmas, acute, short-awned. Lemmas narrow, short, 3-to 5-nerved, pointed, with an awn projecting from the apex or from between the teeth.

1. Muhlenbergia filiformis (Thurb.) Rydb. Slender Muhlenbergia. Perennial or annual, stems slender 1 to 12 inches high, often lax; leaves flat usually less than one inch long; panicle narrow, interrupted, few-flowered; glumes ovate, entire; lemmas lanceolate, acute, mucronate.

2. *Agrostis* L.

Perennial or rarely annuals with small 1-flowered spikelets in panicles. Glumes 2, equal, sharp-pointed, keeled. Lemmas usually shorter than the glumes, obtuse, thin, awnless or sometimes bearing an awn from the back. Paleas shorter than the lemmas, sometimes missing. Grain free or enclosed in the lemma.

Rachilla prolonged behind the palea.....

.....1. *Agrostis aequivalvis*

Rachilla not prolonged behind the palea.....

.....2. *Agrostis exarata*

1. *Agrostis aequivalvis* Trin. Northern bent-grass.

Stems slender, tufted, 6 to 24 inches high; panicle open, usually purplish; glumes equal, acute; lemma obtuse, awnless, almost as long as the glumes; the spikelet axis (rachilla) prolonged behind the palea into a minutely pubescent rudiment nearly half as long as the palea.

2. *Agrostis exarata* Trin. Western bent-grass.

Stems erect, tufted, 1 to 2 1/2 feet high; leaves narrow, rough, flattened; panicle 2 to 10 inches long, contracted and spike-like or loose and interrupted, branches appressed and spikelet bearing to the base; glumes rough on the back; lemmas obtuse, mildly toothed at apex, usually awnless.

3. *Calamagrostis* Adans.

Perennials with small spikelets in narrow or open panicles. Spikelets 1-flowered with the rachilla produced

above the floret into a short, usually hairy bristle. Glumes nearly equal, acute or acuminate. The lemma usually more delicate in texture than the glumes, surrounded at the base with callus hairs and awned on the back, usually from below the middle.

1. Calamagrostis canadensis (Michx.) Beauv. Blue-joint. Stems tufted, slender, 2 to 5 feet high; leaves flat, rough,  $1/4$  to  $1/2$  inch wide; panicle open, pyramidal, purple; lemma nearly as long as the glumes, smooth with a short, straight awn; glumes equal, acute, roughened.

#### 4. Trisetum Pers.

Tufted perennials with flat leaf-blades and open or loose spike-like, terminal panicles. Spikelets usually 2-flowered, rarely 3-to 5-flowered. Florets perfect or uppermost one staminate. Lemmas usually shorter than the glumes, membranous, keeled, 2-toothed at apex and bearing above the middle of the back a slender awn. Palea narrow, 2-toothed.

1. Trisetum cernuum Trin. Nodding trisetum. Stems lax, 2 to  $3\ 1/2$  feet high; sheaths smooth; blades rough, thin, lax,  $1/4$  to  $1/2$  inch wide; panicle 5 to 12 inches long, loose, open, nodding, the branches spikelet-bearing toward the ends, naked below; spikelets 2-to 4-flowered,  $1/4$  to  $1/2$  inch long; lemma  $1/4$  to  $1/2$  inch long, with a

slender, spreading, twisted awn about twice its length.

#### 5. *Avena* L.

Annuals or perennials with large, open or narrow, terminal, few-flowered panicles. Spikelets large, usually 2- to several-flowered. The lower flowers perfect, the upper ones often staminate. Glumes 2, somewhat unequal in length, membranous, persistent, many nerved. Lemmas 2-toothed at apex, 5- to 9-nerved, bearing on the back a long, bent and twisted awn. Palea narrow, 2-toothed at apex.

1. *Avena fatua* L. Wild oat. Annual; stems 1 to 3 feet high, stout, erect; leaves flat, long; panicle open, usually 3-flowered; glumes about 1 inch long; lemmas nerved, clothed with long, stiff, brownish hairs; awns stout, bent, red-brown, twisted below, about 1 1/2 inches long.

#### 6. *Melica* L.

Perennial grasses with unbranched stems, often bulbous at the base. The leaf-blades usually flat, sheaths closed, spikelets rather large, 2- to several-flowered arranged in panicles, often one-sided. The rachilla joined above the glumes and between the florets, extending beyond the perfect florets and bearing 1 to 3 smaller empty lemmas. Glumes large, usually unequal, thin, papery, 3- to 5-nerved. Lemmas firm, larger than the glumes, rounded on the back,

several-nerved, margins scarious. Palea 2-keeled, broad, shorter than the lemma.

1. Melica subulata (Griseb.) Scribn. Alaska onion-grass. Stems tufted, usually few, bulbous at the base, 2 to 4 feet high; blades flat and shining; panicle narrow, rather loose,  $3/4$  to 1 inch long, loosely 3- to 5-flowered; glumes unequal, obscurely nerved, usually purplish; lemmas pubescent, exceeding glumes prominently 7-nerved, gradually tapering to an acuminate point.

#### 7. Poa L.

Annuals or perennials with flat or folded leaves and contracted or open panicles. Spikelets 2- to several-flowered, the uppermost floret rudimentary. Glumes acute, keeled, 1- to 3-nerved. Lemmas awnless, keeled, 5-nerved, often with a tuft of cob-webby hairs at the base.

Plants with creeping rhizomes.

Stems flattened.....1. *Poa compressa*

Stems rounded.....3. *Poa rhizomata*

Plants without creeping rhizomes....2. *Poa gracillima*

1. Poa compressa L. Canada Bluegrass. Perennial with extensive creeping rootstalks; stems conspicuously flattened,  $1/2$  to 2 feet tall, decumbent at the base; leaves 1 to 4 inches long, about one-twelfth inch wide; panicle narrow, 1 to 3 inches long; spikelets 3- to 6- rarely 9-flowered.

2. Poa gracillima Vasey. Pacific Bluegrass.

Perennial with densely tufted stems from a decumbent base, 1 to 2 feet high; leaves mostly basal, flat, smooth, soft, 1 to 6 inches long; panicle loose, open, erect, 2 to 4 inches long; spikelets openly 3- to 5-flowered,  $1/4$  to  $1/3$  inches long.

3. Poa rhizomata Hitchc. Timber Bluegrass. Perennial with creeping rootstalks; stems erect, smooth, 1 to 2 feet high; leaves with smooth sheaths, the lower loose and papery; blades flat or folded; panicle oblong, contracted, 1 to 2 inches long, the branches short, slender ascending and few-flowered; spikelets about  $1/4$  inch long, 3- to 5-flowered.

8. Festuca L.

Annual or perennials with narrow or open panicles. Spikelets 2- to several-flowered. Glumes narrow, unequal, acute, keeled, the lower 1- to rarely 3-nerved, the upper 3- to rarely 5-nerved. Lemmas firm, rounded on the back, pointed or with an awn from the tip; palea usually equaling the lemma.

Plants annual; stamens usually one.....1. *Festuca megalura*

Plants perennial; stamens three.

Lemmas awnless or nearly so.....2. *Festuca viridula*

Lemmas awned.....3. *Festuca occidentalis*

1. Festuca megalura Nutt. Western six-weeks fescue.

Erect annual; stems tufted, 4 to 24 inches high; leaves smooth, slender, 2 to 5 inches long; panicle narrow, spike-like, 1 to 8 inches long, somewhat one-sided with erect branches; spikelets 4- to 5-flowered, glumes glabrous, lemmas scabrous, attenuate into an awn twice its length.

2. Festuca viridula Vasey. Mountain bunch-grass.

Perennial; stems loosely tufted, 1 1/2 to 3 1/2 feet high; leaves erect, soft, more or less involute; panicle loose, open, ascending, 4 to 6 inches long; spikelets 3- to 6-flowered; lemmas usually awnless or very short awned.

3. Festuca occidentalis Hook. Western fescue.

Perennial; stems densely tufted, 1 1/2 to 3 feet high; leaves numerous, mostly basal, soft, smooth; panicle loose, nodding, 3 to 8 inches long; spikelets loosely 3- to 5-flowered; lemmas scabrous, thin, tipped with a slender awn of equal length or longer.

9. Bromus L.

Annual, biennial or perennial grasses with flat leaves and large, open or more or less contracted, terminal panicles. Spikelets 5- to 15-flowered. Glumes unequal, acute or obtuse. Lemmas rather rigid, convex or keeled, acute, sometimes 2-toothed at apex, or obtuse, short-awned or awnless. Palea usually slightly shorter than the lemma, 2-keeled.

Spikelets strongly flattened and keeled

Lemmas smooth or rough; sheaths smooth.....

.....1. *Bromus polyanthus*

Lemmas pubescent at least below.....

.....2. *Bromus marginatus*

Spikelets not strongly flattened and keeled.....

.....3. *Bromus vulgaris*

1. *Bromus polyanthus* Scribn. Great Basin brome-grass.

Perennial, stems erect, smooth, 2 to 3 feet high; panicle elongated, erect or somewhat spreading; spikelets dense, 7- to 11-flowered; glumes broad, smooth or somewhat rough; lemma smooth, 7-nerved with a broad, thin, transparent margin; awn conspicuous, 1/4 to 1/3 inch long.

2. *Bromus marginatus* Nees. Large mountain brome-grass. Perennial; stems coarse, tufted, 1 to 4 feet tall, sparsely pubescent; panicle erect, rather narrow or somewhat spreading, usually 4 to 8 inches long; spikelets 1 to 1 1/2 inches long, 7- to 8-flowered; glumes broad, rough or rough pubescent; lemmas somewhat leathery, coarsely pubescent, about 1/2 inch long; awns 1/6 to 1/4 inch long.

3. *Bromus vulgaris* (Hook.) Shear. Narrow-flowered brome-grass. Stems 3 to 4 feet tall; nodes, sheaths and blades pubescent to pilose; panicle open, 4 to 6 inches long, the branches slender and drooping; glumes narrow, sparsely pubescent; lemmas 1/2 inch long, sparsely pubescent on back, pubescent or ciliate near the margins or



nearly glabrous; awns about  $1/3$  inch long.

#### 10. *Elymus* L.

Perennial or annual with a spike-like inflorescence which does not readily disarticulate at maturity. Spikelets flattened, 2- to 6-flowered. Glumes entire, equal, rigid, narrow. Lemmas acute, entire, obscurely 5-nerved, usually with a blunt or sharp-pointed awn from the apex. Palea shorter than the lemma, 2-keeled.

Glumes and lemmas awnless or mucronate.....

.....1. *Elymus virescens*

Glumes and lemmas distinctly awned.....

.....2. *Elymus glaucus*

1. *Elymus virescens* Piper. Pacific Rye-grass.

Stems erect, glabrous, 1 to 2 feet high; spike dense, erect, 3 to 4 inches long; glumes prominently 3-nerved, lanceolate; lemmas lanceolate, not ciliate, firm.

2. *Elymus glaucus* Buckl. Western Rye-grass. Stems erect, 2 to 4 feet high; leaves thin,  $1/6$  to  $5/8$  inch wide, 4 to 12 inches long; spike erect, narrow or rarely nodding, 2 to 8 inches long, greenish or purplish; glumes lanceolate,  $1/3$  to  $1/2$  inch long, 3- to 5-nerved, pointed or awn-tipped; lemmas rough near apex with awn about twice as long as the body.

#### 11. *Sitanion* Raf.

Perennials with spikes which break into segments at maturity. Spikelets usually in pairs at each joint of

the rachis, 2- to 5-flowered. Glumes subulate or lance-shaped, 2- to several-cleft, seldom entire. Lemmas undivided and long awned or split into three divisions and three-awned. Paleas 2-keeled, shorter than the lemmas.

1. Sitanion hystrix (Nutt.) J. G. Smith. Bottle-brush squirrel-tail. Stems slender, erect or ascending, rough above, stiff, 4 to 12 inches high; leaves roughish-pubescent or glabrous, narrow, flat, prominently-veined, 2 1/2 to 5 inches long; spike 2 to 3 inches long, erect, extending from enclosing upper sheath; glumes split at base into two parts, the two widely spreading awns 1 1/2 inches long; lemmas pubescent, awns approximately 1 1/2 inches long.

#### 6. CYPERACEAE. Sedge Family.

Grass-like or rush-like herbs with fibrous roots, annuals or many species perennial having rootstalks. Stems 3- or 4-angled, terete or flattened, mostly solid or rarely hollow. Leaves 3-ranked, narrow, mostly basal. Sheaths not split as in the grasses. Flowers perfect or imperfect in solitary or clustered one- to many-flowered spikelets, one, rarely two, in the axil of the scale. Scales two-ranked or spirally imbricated, persistent or deciduous. Perianth hypogenous, of bristles or none or scales, rarely calyx-like. Stamens usually 1 to 3, rarely none, with slender filaments and 2-celled anthers. Ovary one-celled, 1-ovuled. Style 2- to 3-cleft, rarely simple.

Fruit a lenticular or 3-angled achene. Embryo minute in mealy endosperm.

1. *Carex* L.

Grass-like sedges, perennial by rootstalks. Stems 3-angled. Leaves 3-ranked, the upper elongated or very short and subtending the spikes of the flowers, or wanting. Spikes entirely staminate, entirely pistillate or consisting of both. Perianth none. Flowers monocious or dioecious, solitary in the axils of the bracts. Stamens usually 3. Achene 3-angled, lenticular or plano-convex. The base of peduncle often cloaked by a spathe-like organ (perigynium).

Stigmas 3; achenes 3-angled

Perigynia slightly compressed but not strongly flattened.....1. *Carex ablata*

Perigynia strongly flattened oval in outline, minutely beaked.....2. *Carex spectabilis*

Stigmas 2; achenes lenticular

Lowest bract (uppermost leaf) present and exceeding the stem.....3. *Carex kelloggii*

Lowest bract absent or but little developed.....4. *Carex subfusca*

1. *Carex ablata* Bailey. American cold-loving sedge.

Stems slender, 12 to 24 inches tall; leaves 1/16 to 1/4 inch wide; spikes 3 to 7, the terminal one staminate; perigynia lanceolate, pale green, beak sparsely ciliolate,

bidentate; scales acute, shorter than perigynia, brownish with a green midrib; achene 3-angled; stigmas 3.

2. Carex spectabilis Dewey. Showy sedge. Stems tufted, slender, 12 to 24 inches high; leaves flat, smooth, 1/16 to 1/8 inch wide; spikes 2 to 4, short, erect or nodding; perigynia ovate-elliptic, flat, short beaked; scales purplish-black with a white midrib, shorter than the perigynia; achene 3-angled; stamens 3.

3. Carex kelloggii W. Boott. Kellogg's sedge. Stems tufted, slender, 6 to 16 inches high; leaves 1/16 to 1/8 inch wide, flat or channeled at the base, light green; spikes 3 to 5, sessile or nearly so, 1/16 to 1/8 inch long, cylindrical; perigynia numerous, ascending; scales obtuse or acute with a broad, light-colored center minutely beaked; achenes lenticular; stigmas 2.

4. Carex subfusca W. Boott. Rusty sedge. Stems slender, 8 to 14 inches high; leaves 1/16 to 1/8 inch wide; spikes 4 to 8, aggregated; ovoid or oblong head, 1/8 to 3/8 inch long; perigynia appressed-ascending, ovate, 1/8 inch or a little more wide, plano-convex, winged to the base, serrulate above; scales shorter than perigynia, ovate, acute, brownish with papery margins; achenes lenticular; stigmas 2.

#### 7. JUNCACEAE. Rush Family.

Perennial or annual, grass-like or rush-like herbs. Flowers usually in panicles, corymbs or heads. Leaves

alternate, stiff, cylindrical or flat, arising from sheaths. Perianth of 6 chaffy divisions. Stamens 3 to 6. Anthers basifixed. Ovary superior. Style 1, with 3 stigmas. Fruit a capsule.

Leaf-sheaths open; capsule 1- or 3-celled, many-seeded;

stems usually pithy.....1. *Juncus*

Leaf-sheaths closed; capsule 1-celled, 3-seeded; stems

hollow.....2. *Luzula*

### 1. *Juncus* L.

Grass-like herbs. Leaves glabrous, round or flat at least near base. Leaf-sheaths open. Flowers in panicles or corymbs. Stamens 3 to 6. Ovary 1- to 3-celled. Seeds few to many.

The lower leaf of the inflorescence appearing like a continuation of the stem, inflorescence therefore appearing lateral.....1. *Juncus effusus*

The lower leaf not as above, inflorescence therefore appearing terminal.....2. *Juncus ensifolius*

1. *Juncus effusus* L. Common rush. Stems densely tufted, smooth, round, about 2 to 4 feet high; panicle compound, many-flowered; perianth-segments lanceolate, acuminate; stamens 3.

2. *Juncus ensifolius* Wiks. Three-stamened rush. Stems leafy, 1 to 2 feet high, flattened, 2-edged; panicle of 2 to 7 rather large, dense, many-flowered heads, dark brown or nearly black; perianth-segments lanceolate, acuminate; stamens 3, occasionally 6.

2. *Lazula* DC.

Grass-like herbs. Leaves usually sparingly pubescent. Leaf-sheaths closed. Flowers in umbels, panicles or head-like clusters. Stamens 6. Ovary 1-celled containing 3 seeds.

Flowers in a loose panicle, solitary on the end of the branches.....1. *Lazula parviflora*

Flowers congested into spikes or head-like

clusters.....2. *Lazula campestris*

1. *Lazula parviflora* (Ehrh.) Desv. Small-flowered wood-rush. Stems slender, 1 to 2 feet tall; leaves many with a few long hairs at the base; panicle loose, nodding; perianth-segments greenish or straw-colored, hardly equaling the straw-colored capsule.

2. *Lazula campestris* D.C. Common wood-rush. Stems tufted, erect; leaves villous, flat; heads oblong on nodding or erect peduncles; perianth segments brown or straw-colored, lanceolate, exceeding the pale brown capsule.

## 8. LILIACEAE. Lily Family

Ours, perennial herbs, the stems arising from bulbs, corms or rootstalks. Flowers regular and perfect. Petals and sepals of three usually separate parts, commonly colored alike. Stamens usually six. Ovary with three compartments, superior. Fruit a capsule or a berry.

Fruit a capsule.

Leaves whorled.

All the leaves in one whorl of 3..10. Trillium

Leaves in several whorls of more than 3.....

.....4. Liliium

Leaves not whorled, not as above

Plants with narrow leaves appearing grass-like.....

.....1. Xerophyllum

Plants with leaves nat as above

Leaves only 2, rather broad, appearing to be basal..

.....5. Erythronium

Leaves several to many, located on the stem

Stem very leafy, tall; flowers small and many in a  
panicle.....2. Veratrum

Stem with few leaves, relatively short; flowers

showy, few.....3. Calochortus

Fruit a berry

Plants with leafy stems

Flowers few, drooping

Flowers axillary.....9. Streptopus

Flowers terminal, 1 to 2 at end of stem.....

.....8. Disporum

Flowers many.....7. Smilacina

Plants with few leaves, mostly basal. 6. Cintonia

1. Xerophyllum Michx.

Stem solitary with stiff, narrow leaves which form  
dense basal tufts. Flowers white or cream-colored borne  
in a dense pyramidal raceme. Perianth segments six, spread-

ing and remaining after withering. Stamens six. Styles three.

1. Xerophyllum tenax (Pursh) Nutt. Bear-grass. Stems two to six feet tall; basal leaves many, stiff and linear with roughened margins; racemes dense, the elongated pedicels with a scarious bract at the base.

### 2. Veratrum L.

Stems tall, bearing coarse-veined, plaited leaves. Flowers very numerous in large, showy, greenish or cream-colored terminal panicles. Perianth segments six, and connected with the base of the ovary. The six stamens opposite the perianth segments and free from them. Styles three. Ovary a three-celled capsule.

1. Veratrum insolitum Jepson. Siskiyou false hellebore. Stems stout, four or five feet tall; leaves elliptic, seven to eight inches long, acute at the apex; panicle one to two feet long, made up of lanate-tomentose racemes; perianth segments one-fourth inch to one-third inch long, white, irregularly ciliate or erose or shallowly fimbriate within. The ovary is densely woolly.

### 3. Calochortus Pursh.

Stem simple or branched from a coated corm. Leaves narrow, only one basal. Flowers large, showy, few. Sepals 3, greenish. Petals 3, variously colored with a gland borne on the surface or at the base. In some cases the



sepals are marked by a conspicuous purple pit at the base. Stamens 6. Capsule 3-angled or 3-winged and celled.

1. Calochortus Lobbii (Baker) Purdy. Alpine cat's ear. Stems nodding 3 to 7 inches tall; sepals lanceolate or ovate, acute, with a conspicuous purple pit at the base; petals cream-colored, bearded to the lip, ovate, gland covered by a narrow, entire, scale; anthers about equaling the filaments.

#### 4. Lilium L.

Simple stem with a numerous, alternate or whorled, narrow, sessile leaves. Flowers large, showy, erect or nodding, one-to-several. Sepals and petals similar. Perianth segments 6, usually funnel-form or bell-shaped. Stamens 6, anthers versatile. Style 1, stigmas 3.

1. Lilium washingtonianum Kell. Cascade lily. Stem simple, 3 to 6 feet tall; leaves oblanceolate, apex acute, mostly in whorls, some alternate; flowers pure white becoming purplish with age, solitary or several in a raceme; capsule angled or sometimes narrowly-winged.

#### 5. Erythronium L.

Stem simple from a narrow deep-seated corm. Leaves flat, smooth, in a pair, appearing basal. Flowers large, solitary or in a raceme. Perianth segments 6, similar, all much recurved. Stamens 6, shorter than the perianth. Style 3-cleft or entire. Capsule 3-angled.

1. Erythronium grandiflorum Pursh. var. pallidum St. John. Yellow avalanche lily. Stem erect, 6 to 12 inches tall; leaves oblong-lanceolate, bright solid green; flowers fragrant, bright yellow, with a pale spot at the base of each petal; anthers white; style 3-cleft, longer than the stamens.

#### 6. *Clintonia* Raf.

Stems simple, erect. Leaves few, basal, broad, and tapering toward the base. Flowers solitary or in an umbel. Perianth segments 6, similar, free. Stamens 6, inserted on the base of the segments. Ovary 2- or 3-celled. Fruit a berry.

1. Clintonia uniflora Kunth. Queen's cup. Stem slender, 3 to 5 inches long, shorter than the leaves and usually one-flowered; leaves basal, 2 or sometimes 3, oblong or narrowly elliptic; flowers white, bell-shaped; fruit a blue berry.

#### 7. *Smilacina* Desf.

Stems simple from a horizontal rootstalk. Leaves alternate, sessile, and conspicuously veined. Flowers small and white, borne in a terminal raceme or panicle. Perianth segments 6, similar, and persistent. Stamens 6, inserted on the bases of the segments. Fruit a globose berry.

Inflorescence a few-flowered raceme.....

.....1. *Smilacina sessilifolia*

Inflorescence a many-flowered panicle.....

.....2. *Smilacina amplexicaulis*

1. *Smilacina sessilifolia* Nutt. Small false

Solomon's seal. Rootstalk slender; stems 1 to 2 feet tall; leaves alternate, sessile, clasping at the bases, lanceolate to ovate, acuminate; flowers white, borne in a few-flowered raceme; berry red.

2. *Smilacina amplexicaulis* Nutt. Large false

Solomon's seal. Rootstalk stout; stems 1 to 3 feet tall; leaves flat, ovate to broadly-elliptic; flowers, cream-colored, numerous, borne in a many-flowered panicle; berry light red.

### 8. *Disporum* Salisb.

Stem branched, erect, leafy above from a short horizontal rootstalk. Lower leaves scaly, borne mostly beneath the ground. Uppermost foliage leaves ovate to broad-elliptic, clasping. Flowers bell-shaped, drooping, white or greenish-yellow borne terminally. Stamens 6. Stigmas 1 to 3. Fruit a berry.

1. *Disporum Smithii* (Hook.) Piper. Fairy lanterns.

Stems branched, 1 to 3 feet high; leaves minutely pubescent, broadly ovate, acute to acuminate, somewhat heart-shaped at base; flowers bell-shaped, white, perianth-segments erect, slightly spreading at the apex; style three-cleft; berry smooth, glabrous except the beak which is also wrinkled.

9. *Streptopus* Michx.

Stems leafy, simple or branched, from slender creeping rootstalks. Leaves thin, oval or ovate, sessile or clasping, pointed at the apex. Flowers white, greenish, or purplish in color, solitary or in pairs, borne in the axils of the leaves. Peduncles twisted or bent at about the middle. Stamens 6. Fruit a berry.

1. *Streptopus amplexifolius* (L.) DC. Twisted stalk. Stems branched, 1 to 3 feet high; leaves ovate, acuminate, clasping and heart-shaped at the base, usually glaucous on the under side; flowers greenish-white, 1 or 2 on a twisted or bent stalk at the back of the upper leaves; fruit an elliptical, red berry.

10. *Trillium* L.

Stem simple from a short rootstalk. Leaves 3 in a whorl at the summit of the stem. Flower solitary, sessile or stalked, at the center of the leaf whorl. Sepals 3, green, persistent. Petals 3, larger than the sepals, white, pink, purple, or sometimes greenish. Stamens 6. Ovary sessile 3- to 6-angled. Fruit a fleshy capsule.

1. *Trillium ovatum* Pursh. Wood lily. Stem 8 to 12 inches tall; leaves sessile, broadly ovate, acute or acuminate; flowers fragrant, pedicels 2 to 4 inches long; petals white, changing to pink with age; anthers yellow; capsule somewhat 6-angled.

## 9. ORCHIDACEAE. Orchid Family.

Perennial herbs with entire sheathing leaves, these sometimes reduced to scales. Flowers perfect, irregular. Sepals 3, green, persistent, alike. Petals 3, 2 alike, the third forming a lip or sac. Stamens and styles united into a "column". Ovary inferior. Fruit a 3-celled capsule. Seeds minute, many.

Plants with green foliage leaves present

Flowers with a spur.....1. *Habenaria*

Flowers without a spur.....2. *Listera*

Plants with leaves reduced to scales, not as above.....

.....3. *Corallorhiza*

1. *Habenaria* Willd.

Stems erect, solitary, leafy at least at the base.

Flowers small, greenish or white, in a terminal spike or raceme. Sepals and petals nearly alike; lip spreading or drooping, produced at the base into a spur. Column short.

Leaves basal, stem leaves bract-like, usually withered by

flowering time.....1. *Habenaria unalaschensis*

Leaves not basal, stems leafy, not withered, not as

above.....2. *Habenaria saccata*

1. *Habenaria unalaschensis* (Spreng.) Wats. Alaska

bog orchid. Stem slender, not leafy, 1 to 2 feet tall; leaves oblanceolate, usually withered by flowering time;

flowers greenish, less than 1/2 inch long, borne in a slender spike; lip ovate, shorter than the ovary; spur slender, curved, slightly longer than the lip.

2. Habenaria saccata Greene. Green bog orchid.

Stem leafy, 1 to 2 1/2 feet tall; leaves lanceolate becoming reduced upward to bracts; flowers green, borne in a slender spike; lip narrowly-linear, obtuse; spur much shorter than the lip.

2. Listera R. Br.

Stem erect, bearing 2 opposite leaves near the middle. Flowers small in a terminal raceme. Sepals and petals alike, slender, spreading or reflexed. Lip longer and broader than the sepals, 2-lobed at apex and formed by the lower petal. Pollen masses paired. Capsule somewhat round.

1. Listera caurina Pip. Northwestern twayblade.

Stem slender, simple, erect, 4 to 12 inches tall; leaves 2, opposite, obtuse or ovate, acute, sessile; flowers 5 to 15, greenish; ovary glabrous; lip very short, minutely toothed and the sepals not turning back against the pedicel at maturity.

3. Corallorhiza R. Br.

Saprophytes (live on dead organic matter) with coral-like branching rootstalks. Leaves all reduced to sheathing scales. Flowers in terminal racemes. Petals about as

long as the sepals, 2 petals and sepals nearly alike, the third petal much broader, forming the lower lip which is 1- to 3-ridged. Anthers terminal, opening by a lid. Fruit a capsule which reflexes after forming. Pollen masses 2 pairs.

Lip purple-spotted, 3-lobed; spur attached almost its whole length.....1. *Corallorhiza maculata*

Lip purple, not spotted, entire or toothed; spur free below middle.....2. *Corallorhiza Mertensiana*

1. *Corallorhiza maculata* Raf. Spotted coral-root.

Stems 8 to 15 inches tall; raceme 10- to 30-flowered, about 2 to 6 inches long; sepals and petals project forward in the form of a loose hood; lip broad and 3-lobed at the base, conspicuously purple-spotted; capsule  $\frac{3}{4}$  inch long,  $\frac{1}{4}$  inch broad, reflexed.

2. *Corallorhiza Mertensiana* Bong. Purple coral-root.

Stems 10 to 20 inches tall; raceme many-flowered, 4 to 8 inches long; flowers dark red or purplish; spur free below the middle; lip broad, entire or slightly toothed, solid purple or dark red in color; capsule  $\frac{3}{4}$  inch to  $\frac{3}{8}$  inch broad, reflexed.

#### DICOTYLEDONS.

Leaves usually netted-veined, parts of the flower commonly in 4's or 5's, vascular bundles arranged concentrically around a central pith, two seed leaves.

## 10. BETULACEAE. Birch Family.

Trees or shrubs with simple, alternate, deciduous leaves. Staminate catkins drooping, long and slender. Pistillate catkins short, erect, spreading or drooping. Fruit a small, oval, 1-celled nut or samara.

1. *Alnus* Hill.

Trees or shrubs with broad, toothed leaves. Staminate catkins long, drooping, appearing early in the season. Pistillate flowers erect, becoming dark brown and woody at maturity, persisting on the tree after the seeds have fallen. Staminate calyx consisting usually of a 4-parted perianth. Stamens 1 to 4.

1. *Alnus sinuata* (Regel.) Rydb. Sitka alder. Small tree or shrub, 10 to 30 feet tall, erect, or shrubby; leaves ovate, 3 inches or more long, sharply toothed or serrate, often lobed, glabrous above, smooth shining beneath, quite gummy when young; flowers appearing at the same time as the leaves; cones shorter than the stems.

## 11. FAGACEAE. Oak Family.

Trees or shrubs with simple, alternate, pinnately veined leaves. Stamens and pistils borne in different flowers. Petals none. Staminate flowers in catkins. Pistillate flowers sessile within a cup-like or bur-like involucre. Ovary inferior, 3- to 6-celled. Fruit a nut borne in a cup or bur.



1. *Castanopsis* Spach.

Trees or shrubs with evergreen leaves. Flowers erect in an axillary or terminal panicle. Staminate flowers in 3's, with 6 to 12 stamens. Calyx 5- to 6-lobed. Pistillate flowers 1 to 3 in a scaly involucre. Ovary maturing 1 to 3 nuts in a roundish involucre, densely covered with brown branching prickles forming a spiny bur.

1. *Castanopsis chrysophylla* A. DC. Giant chinquapin.

A shrub or tree, in some localities reaching a height of 115 feet; bark plated, reddish-brown; leaves lanceolate, pointed, dark green above, golden-yellow below; burs spiny and chestnut-like.

## 12. ARISTOLOCHIACEAE. Dutchman's Pipe Family

Herbs or twining shrubs with alternate, petioled, heart-shaped leaves. Petals none. Sepals 3, petal-like, partly united. Ovary 6-celled, inferior.

1. *Asarum* L.

Perennial herbs with aromatic, alternate, branched rootstalks. Leaves heart-shaped, entire. Flowers solitary, in the leaf axils, borne near the ground. Calyx regular with three divisions, bearing long tails. Stamens 12. Styles 6, united.

1. *Asarum caudatum* Lindl. Wild ginger. Rootstalk creeping, elongate; leaves short-hairy, reniform-cordate on slender petioles; flowers brownish-purple; calyx-lobes elongated into attenuate tails, 1 to 3 inches long.

## 13. POLYGONACEAE. Buckwheat Family.

Herbs or shrubs with simple leaves. Flowers small, regular, perfect. Petals none. Stipules usually united, forming a sheath, or sometimes missing. Sepals 3 to 6. Stamens 4 to 9, appearing to be attached upon the calyx. Ovary superior. Fruit an achene, 3-sided or lens-shaped. Leaves with stipules wanting; flowers involucrate.....

.....1. Eriogonum

Leaves with stipules present and sheath-like; flowers not as above

Sepals 6, unequal; stigmas tufted.....2. Rumex

Sepals 5, equal; stigmas capitate.....3. Polygonum

## 1. Eriogonum Michx.

Herbs or shrubs with basal, alternate or whorled leaves. Flowers small, perfect, subtended by a 5- to 8-lobed involucre. Calyx of 6 petal-like divisions, yellow, white or rose colored. Petals none. Stamens 9. Styles 3. Stigmas capitate. Fruit usually a 3-angled achene. Calyx with a stalk-like extension at the base.

Leaves large, 1 to 3 inches long, mostly cordate.....

.....1. Eriogonum compositum

Leaves small, never cordate.....

.....2. Eriogonum umbellatum

Calyx not stalk-like at the base.....

.....3. Eriogonum nudum

1. Eriogonum compositum Dougl. Heart-leaved eriogonum. Stems stout, simple, 1/2 to 1 1/2 feet tall, glabrous or nearly so; leaves long-petioled, basal, 1 to 3 inches long, ovate or oblong-ovate, cordate, acute, underneath surface of leaf densely white-woolly, green or somewhat woolly above; umbel 6 to 10 rayed, usually compound and densely clustered; principal bracts conspicuous, linear or oblanceolate; involucre woolly, 5-lobed; lobes acute and spreading; flowers white or yellow.

2. Eriogonum umbellatum Torr. Sulphur-flower. Stem 6 to 8 inches tall, erect or ascending from a woody, much branched base; leaves spatulate, the blade oblong, 1/2 to 1 inch long, densely white-woolly beneath, green and glabrous above; umbel 3- to 10-rayed, simple; bracts in a foliaceous whorl at the base of the umbel; involucre rounded, woolly, the deeply-cleft lobes becoming reflexed; flowers deep sulphur yellow.

3. Eriogonum nudum Dougl. Naked eriogonum. Stems tall and slender, 1 to 1 1/2 feet tall; leaves oblong or ovate, woolly beneath and green above, in a basal rosette; flowers white or rose-tinged or sometimes yellowish, borne in clusters of 3 to 6.

## 2. Rumex L.

Mostly perennial herbs with entire or undulate, flat to crisped leaves and thin sheathing stipules. Sheaths soon wholly or partly falling away. Stems grooved, usually

branched. Flowers green or reddish borne in whorls on jointed stems. Sepals 6, the 3 outer sepals unchanged in fruit, the 3 inner ones becoming large and later surrounding the achene. Stamens 6, styles 3, stigmas tufted.

Plant small; leaves hastate.....1. *Rumex acetosella*

Plant coarse; leaves not as above.....2. *Rumex occidentalis*

1. *Rumex acetosella* L. Sour dock. Perennial plant with slender, creeping rootstalks; stems tufted, 1/2 to 2 feet high; lower leaves hastate, the upper ones reduced, linear; staminate and pistillate flowers borne on separate plants, staminate yellowish and pistillate reddish; flowers borne in panicles, the latter comparatively smaller; pedicels not jointed; achenes 3-angled, longer than the continuing sepals.

2. *Rumex occidentalis* Wats. Western dock. Plant coarse, stout, little branched, 3 to 6 feet tall; lower leaves with blades often a foot long, petiole longer than the blade, ovate or oblong-ovate with a heart-shaped base, margins entire or wavy; flowers in a large, narrow panicle turning reddish in fruit; usually without callous grains.

### 3. *Polygonum* L.

Herbs with alternate, entire leaves and conspicuous sheathing stipules. Pedicels jointed. Sepals usually 5. Flowers small, green, white or pink. Stamens 4 to 9. Styles 2 to 3. Stigmas capitate.

Leaves broad, comparatively large; stems not as below.

Flowers white in a dense head-like raceme.....

.....1. *Polygonum bistortoides*

Flowers green in a few-flowered axillary raceme or

cluster.....2. *Polygonum Newberryi*

Leaves narrow; stems wiry

Leaves oval, scarcely reduced upward; plant 2 to 6 inches high.....3. *Polygonum minimum*

Leaves somewhat linear, decidedly reduced upwards; plant generally 10 inches or more in height.....

.....4. *Polygonum Douglasii*

1. *Polygonum bistortoides* Pursh. Bistort. Perennial; stems simple, erect, 1 to 2 feet high, bearing a dense terminal spike; leaves mostly basal, 6 to 10 inches long including the petiole; stem leaves much smaller, sessile, lanceolate; flowers white, borne in dense, oblong spikes, 1 to 1 1/2 inches long; bracts brown and papery; flowers borne in pairs on the spikes.

2. *Polygonum Newberryi* Small. Newberry's knotweed. Perennial; somewhat pubescent or glabrous throughout; stems simple, stout, fleshy, and flexous; leaves dull green, ovate to ovate-oblong, 1/2 to 1 1/2 inches long, short-petioled; sheaths short, brown scarious, not fringed; flowers few, greenish, borne in axillary racemes or spikes;

stamens 8, shorter than the sepals, styles 3, achenes brown and 3-angled, smooth and shiny.

3. Polygonum minimum Wats. Leafy knotweed. Annual; stems slender, reddish, wiry, leafy, usually branching or simple, 1 1/2 to 6 inches tall; leaves ovate or oval, acute 1/4 to 1/2 inch long, nearly sessile; flowers erect, axillary, usually pinkish or rose-colored, small; achenes black, smooth and shiny.

4. Polygonum Douglasii Greene. Douglas' knotweed. Annual; stems slender, erect, usually branched, 10 to 20 inches tall, leaves narrowly lanceolate or linear, 1 to 2 inches long; sheaths papery, fringed at the apex; flowers borne in the axils of the upper, reduced, scale-like leaves; inflorescence a loose, scattered, spike; pedicels recurved soon after flowering; flowers white or pink; sepals with green midrib; achenes black, smooth and shiny.

#### 14. CARYOPHYLLACEAE. Pink Family

Herbs with opposite, simple, entire leaves at often slightly enlarged nodes. Flowers regular, usually perfect. Sepals and petals 5 or 4. Stamens 5 or 10, rarely fewer, alternate with the petals when not exceeding them in number. Ovary superior, 1-celled. Styles 1 to 5. Fruit a capsule, utricle or achene.

Sepals free, or united only at the base

- Stipules present; petals entire.....1. *Spergularia*  
 Stipules none.....2. *Arenaria*  
 Sepals united into a tube.....3. *Silene*

1. *Spergularia* J. and C. Presl.

Small herbs with narrow, linear, opposite leaves and scarious stipules. Sepals and petals 5. Stamens usually 10. Styles 3 to 5, distinct. Capsule 3-valved.

1. *Spergularia rubra* (L.) J. and C. Presl. Pink mat-weed. Stems prostrate forming a mat; the whole plant leafy, much-branched from the base; leaves small, linear; stipules conspicuously silvery-scarious; flowers pediceled, pink or reddish, rarely white; sepals oval, papery-margined, slightly longer than the petals.

2. *Arenaria* L.

Annual or perennial herbs with linear to ovate leaves. Flowers small, white, in cymes or axillary. Sepals and petals 5, the latter entire or nearly so. Stamens 10. Styles 3. Capsule opening with 3 entire or 2-toothed valves.

Leaves narrowly linear, stiff; plants glandular-hairy...

.....1. *Arenaria capillaris*

Leaves ovate to lanceolate, soft; plants not glandular-hairy.....2. *Arenaria macrophylla*

1. *Arenaria capillaris* Poir. Slender sandwort.

Perennial; stems very slender, bright green and glandular, 2 to 9 inches high, from a matted base of short branches;

leaves mostly basal, linear, 1/2 to 1 1/2 inches long, tufted; stem leaves few, reduced upwards; flowers white, borne on pedicels in a loose cyme; sepals elliptic longer than the petals; capsule exceeding the calyx.

2. Arenaria macrophylla Hook. Large-leaved sandwort. Stems slender, short hairy, 2 to 4 inches high; leaves lanceolate to elliptic or oblong, acute; flowers borne in few-flowered cymes; sepals ovate-lanceolate, acute or acuminate usually longer than the petals.

### 3. *Silene* L.

Annual or perennial herbs, more or less glandular-sticky. Sepals united into a tube or inflated, 5-toothed. Petals 5, clawed, these sometimes with 2 scales at the base of the blade. Stamens 10. Styles 3, rarely 4. Capsule opening by 3 or 6 teeth at the apex.

1. *Silene campanulata* Wats. Bell-shaped catchfly. Perennial from the crown of a thick tap root; stems many, erect, leafy, 8 to 10 inches high; leaves oblanceolate to elliptic, acute to acuminate, sessile, 3/4 to 1 inch long; flowers white, about 1/2 inch long, borne on deflexed pedicels; calyx broadly bell-shaped, its teeth about one-half as long as the tube; petals greenish-white or flesh-colored, 4- to 6-cleft into linear lobes; scales conspicuously developed and toothed.



## 15. PORTULACACEAE. Purslane Family.

Herbs with fleshy, entire leaves. Flowers regular, perfect. Sepals 2, seldom more. Petals usually 5, withering early. Stamens 3 to many, opposite the petals when of the same number. Ovary usually superior, 1-celled. Fruit a capsule.

1. *Montia* L.

Low herbs, smooth and fleshy, with opposite, alternate or basal leaves. Flowers small, white, nodding, borne in racemes or umbellate clusters. Sepals 2, ovate, herbaceous, persistent. Petals 5, sometimes unlike. Stamens 3 to 5. Style short, 3-branched. Fruit a 3-valved capsule.

Leaves opposite; stem leaves 2....1. *Montia sibirica*

Leaves alternate; stem leaves more than 2.....

.....2. *Montia parvifolia*

1. *Montia sibirica* (L.) Howell. Candy flower. Stems erect, several, 6 to 15 inches tall; basal leaves ovate, long-petioled; stem leaves a pair, broad, sessile but free from each other; flowers borne in a raceme, each flower subtended by a small leafy bract; petals nearly 1/2 inch long, pink or white, with red veins, notched; stamens 5.

2. *Montia parvifolia* (Moq.) Greene. Small-leaved montia. Small plants producing slender creeping stolons and propagating by leafy rosettes or offsets, flowering

stems produced in the axils of the lower leaves; stems erect, 5 to 10 inches tall, fleshy, often reddish in color; leaves of rosette less than  $\frac{3}{4}$  inch long, broad, acute, short-petioled, very fleshy and smooth; stem leaves reduced above and narrow; flowers borne in a few-flowered raceme; petals white or pink with conspicuously darkened veins, notched at the apex; stamens 5; fruit a one-seeded capsule.

#### 16. RANUNCULACEAE. Buttercup Family.

Herbs or sometimes woody plants with alternate or basal, rarely opposite, simple or compound leaves. Flowers regular or irregular, all parts distinct. Sepals 2 to 5, often petal-like. Petals few, many, or none. Stamens usually many. Pistils several to many, occasionally 1, superior, 1-celled. Fruit usually an achene or follicle, rarely a berry.

Pistils numerous, 1-ovuled; fruit an achene

Stem leaves 3 in a whorl.....1. Anemone

Stem leaves alternate, or none

Leaves simple, palmately lobed.....2. Trautvettaria

Leaves ternately compound.....3. Thalictrum

Pistils few, 2- to many-ovuled; fruit a follicle or a berry.

Flowers irregular

Upper sepal spurred at base; petals 4.....

..... 4. Delphinium

Upper sepal hood-like; petals 2.... 5. Aconitum

Flowers regular

Petals spurred at base.....6. Aquilegia

Petals not spurred

Leaves simple.....7. Caltha

Leaves compound.....8. Actaea

1. Anemone L.

Perennial herbs with palmately divided basal leaves arising from a rootstalk. Stem leaves forming a whorl of 3 some distance below the flower. Sepals usually 5 or more or sometimes 4, petal-like. Petals none. Stamens numerous. Pistils numerous. Fruit an achene.

Stem leaves simple.....1. Anemone deltoidea

Stem leaves compound.....2. Anemone Piperi

1. Anemone deltoidea Hook. Wind-flower. Stems 5 to 10 inches tall, from a slender creeping rootstalk; basal leaves 3-foliolate, long petioled; stem leaves simple, ovate, sessile 1 1/2 to 3 inches long, coarsely toothed; sepals 5 to 7, white, 1/2 to 1 inch long; achenes ovate, minutely hairy, tipped with a short, straight style.

2. Anemone Piperi Brit. Wood Anemone. Perennial from a stout, dark, scaly, deep-seated oblique or vertical rootstalk; basal leaves generally persisting at flowering time; leaflets of stem leaf incisely toothed, acute or acuminate; sepals oval, 4 to 7; flowers white, 1/2 to 1 1/2 inches broad; stamens many; achenes minutely hairy.

## 2. *Trautvetteria* Fisch. and Mey.

Tall perennial herbs. Leaves chiefly basal, long-petioled, and palmately lobed. Flowers perfect, borne in cymes. Sepals 3 to 5, usually 4, petal-like, soon disappearing. Petals absent. Stamens many, whitish, filaments enlarged beneath the anther. Pistils numerous. Fruit an achene.

1. *Trautvetteria grandis* Nutt. False bug-bane. Stems 1 to 3 feet tall; leaves compound, broad, roundish, 5- to 7-lobed, the lobes sharply serrate, long-petioled; flowers white in corymbose cymes.

## 3. *Thalictrum* L.

Perennial herbs, stems arising from a rootstalk. Leaves 2 or 3 times compound. Flowers small, perfect, borne in panicles or racemes, usually dioecious, sepals 4 to 5, greenish, petal-like. Petals absent. Stamens many with delicate, slender filaments. Fruit an achene.

1. *Thalictrum occidentale* Gray. Meadow-rue. Stem slender, 1 to 3 feet tall; leaves 3 times compound; leaflets many, thin, roundish, 3-lobed at apex; staminate flowers greenish, stamens purplish, slender, delicate; pistils 6 to 12, styles reddish; fruit an achene which turns backward at maturity.

## 4. *Delphinium* L.

Herbs with alternate, palmately divided leaves and perfect, irregular flowers. Sepals 5, generally petal-like,

one of them produced into a spur. Petals 4 in 2 unlike pairs. Pistils 3. Fruit developing into 1 to 5 many-seeded follicles.

Mature follicles widely recurving; leaves usually twice palmately divided or toothed. 1. *Delphinium Menziesii*

Mature follicles contiguous, or spreading only at the tips; leaves generally pedately parted into narrow, mostly entire lobes..... 2. *Delphinium depauperatum*

1. *Delphinium Menziessi* DC. Field larkspur. Stem erect, 6 to 20 inches tall, arising from a thickened, more or less irregular tuber, nearly smooth but usually appressed-puberulent at least above; basal leaves roundish in outline, deeply cleft nearly to the base, usually 3-lobed, the segments linear or lanceolate; the segments of the upper leaves narrowly-linear and fewer; racemes loose and usually few-flowered; pedicels spreading, as long or longer than the flowers; sepals dark blue, minutely hairy on the outside; lower petals purple, upper generally white or veined with purple; follicles 3, hairy, or rarely smooth, usually strongly divergent or recurving at maturity.

2. *Delphinium depauperatum* Nutt. Dwarf Larkspur. Very similar to *D. Menziesii* but the hairs not appressed, the whole plant somewhat viscid, with soft rather dense pubescence; leaves generally pedately parted into narrow, mostly entire lobes; the mature follicles erect or spreading only at the tips.

5. *Aconitum* L.

Perennial herbs with alternate palmately-lobed or divided leaves, and showy, irregular flowers. Inflorescence a terminal raceme or panicle. Sepals 5, the upper one in the shape of a hood. Petals 2 to 5, the upper 2 irregular and covered by the hood, the 3 lower ones small or obsolete. Stamens numerous. Pistils 3 to 5, sessile, becoming in fruit many-seeded follicles.

1. *Aconitum Howellii* A. Nels. Aconite. Stems slender, weak and viny, 2 to 4 feet long; leaves comparatively small, on rather short petioles or the upper sessile, bearing bulblets in their axils; sepals pale blue.

6. *Aquilegia* L.

Perennial herbs with ternately compound leaves, and showy, solitary flowers borne in the leaf axils. Sepals petal-like. Petals 5, all alike, each with a large hollow spur, longer than the calyx. Stamens numerous. Pistils 5, becoming several-seeded follicles in fruit.

1. *Aquilegia formosa* Fisch. Columbine. Stems 1 to 3 feet tall; flowers nodding; sepals and spurs bright scarlet; petal blades yellow.

7. *Caltha* L.

Perennial smooth herbs with simple, crenate, reniform or cordate basal leaves. Sepals 5 to 10, petal-like. Petals none. Stamens numerous; pistils several to many, becoming in fruit several-seeded follicles.

1. Caltha biflora DC. White marsh marigold. Stems erect or ascending 3 to 10 inches tall; basal leaves long-petioled, thickish, kidney-shaped, broader than long, with even wavy teeth; flowers 1 to 1 1/2 inches broad, white; sepals 5 to 10, oval to oblong; follicles short-stalked.

### 8. Actaea L.

Perennial herbs with ternately compound leaves. Inflorescence a terminal raceme of small white flowers. Sepals 3 to 5, often 4, petal-like. Petals 4 to 10 or none. Stamens numerous. Pistil 1, becoming a somewhat large, several-seeded, berry.

1. Actaea arguta Nutt. Western Baneberry. Stems 1 to 3 feet tall, leaves all borne on the stem above the ground; leaflets ovate or lanceolate, acuminate, coarsely toothed or lobed; racemes densely flowered, usually terminal but with occasional lateral racemes in the axils of the upper leaves; sepals white or pink-tipped; berries bright red, rarely white, somewhat poisonous.

### 17. BERBERIDACEAE. Barberry Family.

Shrubs or herbs with alternate leaves and perfect flowers. Sepals and petals 6 or absent. Stamens 6 or more, opposite the petals. Anthers opening by uplifted valves hinged at the top. Pistil 1 with a superior ovary. Fruit dry or fleshy.

Shrubs; leaves evergreen, spiny.....1. Berberis

Herbs; leaves not as above

Leaflets 3; flowers in a spike....2. Achlys

Leaflets many; flowers in a raceme or panicle.....

.....3. Vancouveria

1. Berberis L.

Evergreen shrubs with yellow wood and alternate, pinnately-compound, stiff, spiny, leaves. Flowers yellow in racemes. Sepals 6, petal-like, subtended by 3 small bractlets. Petals 6. Stamens 6. Stigma disk-like. Fruit a berry.

1. Berberis nervosa Pursh. Mountain Oregon grape.

Low shrub, 1/2 to 2 feet tall; leaves long, slender, with 11 to 21 leaflets; leaflets ovate or lanceolate, bright green, thick, leathery, spiny-toothed, more or less distinctly palmately-veined with 5 to 7 prominent veins arising from the base; racemes solitary or few, terminal; berries roundish, blue with a white waxy bloom.

2. Achlys DC.

Perennial herbs arising from a horizontal rootstalk. Leaves long-petioled and palmately divided into three distinct leaflets. Flowers borne in an erect spike. Sepals and petals none. Stamens 9 to 13. Ovule solitary, at length developing into a dry indehiscent fruit.

1. Achlys triphylla (Sm.) DC. Vanilla-leaf. Flower stalk slender, leafless, 1 to 1 1/2 feet tall; leaflets thin, roundish, narrower at the base, 3 to 6 inches wide, broadly fan-shaped in outline, the margins wavy; sweetly-fragrant when dried.



3. *Vancouveria* Morr. and Dec.

Perennial herbs with slender, creeping rootstalks. Leaves ternately compound. Flowers in a nodding panicle. Sepals 6, petal-like, reflexed. Stamens 6. Style and stigma 1. Fruit a follicle.

1. *Vancouveria hexandra* (Hook.) Morr. and Dec.

Inside-out flower. Stem slender, 9 to 20 inches tall; leaves triterternately compound, slender-petioled, shorter than the flower stems; leaflets thin, roundish, 3-lobed, heart-shaped at the base, broader above the middle; flowers cream-colored; fruit somewhat crescent-shaped.

## 18. FUMARIACEAE. Bleeding-heart Family

Perennial herbs with alternate compound leaves.

Flowers irregular, perfect. Sepals 2, small. Petals 4, the outer ones the largest, united at the tip over stamens and pistil. Stamens 6, in 2 sets of 3, opposite the outer petals. Fruit a capsule.

1. *Dicentra* Bernh.

Perennial herbs with flowers borne in simple or mostly compound cymes. Outer petals somewhat flattened into a heart-shaped or 2-spurred corolla. Stamens 6, in two sets, filaments united at the middle.

1. *Dicentra formosa* (Andr.) DC. Bleeding heart.

Plant arising from a creeping thickish horizontal rootstalk; leaves all basal, long-petioled, divided twice into 3's and leaflets cut into narrow segments; corolla pink,

heart-shaped, 1 inch or less long, outer petals with spreading tips; flowers 3 to 15, on a stem 8 to 16 inches tall.

### 19. CRUCIFERAE. Mustard Family

Herbs with alternate leaves and perfect regular flowers usually in racemes. Petals 4, arranged in the form of a cross. Sepals 4. Stamens 6, 4 long and 2 short. Pistil 1. Fruit a capsule, either much longer than broad (a silique) or short (a silicle).

Pod short, flattened, a silicle.....1. *Thlaspi*

Pod much longer than broad, a silique

Flowers yellow, cream colored, or orange

Some of the leaves deeply cleft or pinnately lobed

Pods with a distinct break.....2. *Brassica*

Pods beakless

Valves of the pods nerveless.3. *Radicula*

Valves of the pods nerved....4. *Barbarea*

All of the leaves entire or merely toothed.....

.....5. *Erysimum*

Flowers white, pink or purple

Stem arising from a tuberous rootstalk.....

.....6. *Dentaria*

Stem not from a rootstalk, not as above.....

.....7. *Arabis*

#### 1. *Thlaspi* L.

Annual or perennial herbs with entire or toothed

leaves and small white flowers. Stem leaves oblong, clasping. Pod short, somewhat flattened contrary to the partition, valves more or less winged, strongly keeled. Seeds 2 to 8 in each locule.

1. Thlaspi glaucum Nels. Perennial penny-cress. Perennial, stems usually several from a branched, tufted base, 4 to 12 inches tall; basal leaves obovate to spatulate, petioled; stem leaves oblong, entire, sessile, clasping, auriculate; flowers small, white; pods obovate, narrowly winged, shallowly notched.

## 2. Brassica L.

Erect annuals with yellow flowers in an elongated raceme. Leaves entire or serrate with pubescence of simple hairs. Pods cylindrical or slightly angled, with a distinct, stout beak.

Stem leaves clasping.....1. Brassica campestris

Stem leaves not clasping.....2. Brassica arvensis

1. Brassica campestris L. Yellow mustard. Annual; stems erect, branches few, 1 to 4 feet tall; basal leaves petioled, pinnately parted, irregularly toothed or lobed; upper leaves sessile, with entire margins and broad clasping bases, succulent bluish-green; flowers bright golden-yellow, pedicels spreading; pods roundish, tapering into a narrow beak.

2. Brassica arvensis (L.) Ktze. Charlock. Annual; stems erect more or less branching, 1 to 3 feet tall,

clothed with scattered hairs; lower leaves pinnately parted consisting of a large terminal segment and 1 or 2 pairs of smaller segments; upper leaves, scarcely petioled, broad, none clasping, toothed; flowers yellow, showy, about 1/2 inch long; pods stout, ribbed, with a somewhat angled beak extending almost one-half its entire length.

### 3. *Radicula Hill.*

Annual or perennial aquatic or marsh plants with pinnately lobed or divided leaves. Style slender, very short. Pod cylindrical or nearly so. Seeds minute in two rows in each cell.

1. *Radicula curvisiliqua* (Hook.) Greene. Yellow cress. Annual or biennial; stems one to several, branched, 4 to 20 inches tall, sometimes purplish; leaves pinnately lobed or divided, the segments narrow or broader and divided into oval or oblong dentate lobes; flowers small, pale yellow, borne in racemes; pods slender, curved upwards, narrowing into a short, stout style or none.

### 4. *Barbarea R. Br.*

Perennial herbs with angular stems. Leaves lyrate-pinnately parted. Flowers yellow, borne in racemes. Pods linear, round or somewhat 4-angled.

1. *Barbarea orthoceras* Ledeb var. *dolichocarpa* Fernald. Winter Cress. Stems erect, 6 to 20 inches tall; basal leaves simple or with 2 to 4 small leaflets; stem

leaves lyrate-pinnately parted; flowers numerous, small, yellow; pods ascending or spreading, linear, beaked by a stout, very short style.

#### 5. *Erysimum* L.

Erect biennial or perennial herbs with rather narrow, simple, entire or toothed leaves. Flowers very showy, bright yellow to orange. Pod flattened or more or less four-angled. Seeds many, in 1 row in each cell.

1. *Erysimum asperum* (Nutt.) DC. Orange wallflower. Stems simple, stout, 6 to 20 inches tall, leafy whole plant whitish throughout with minute appressed hairs; leaves many, entire or somewhat sparingly dentate; flowers orange, showy, borne in terminal or occasionally axillary racemes; pods stout, 4-angled tipped with a short, stout beak.

#### 6. *Dentaria* L.

Perennial herbs from a long, fleshy, tuberous root-stalk. Stem leaves 2 or 3, situated about or above the middle. Pod linear, cylindrical, more or less flattened parallel to the partition.

1. *Dentaria tenella* Pursh var. *pulcherrima* (Greene). Detl. Large toothwort. Stem 6 to 15 inches tall, with a few-flowered terminal raceme; stem leaves 2 to 5, pinnately parted or compound; basal leaves 3 to 5, cleft or divided, segments broad, more or less toothed or divided, the lobes usually entire; flowers white to purple, pods long, terminating in a stout style.

7. *Arabis* L.

Erect annual, biennial, or perennial herbs. Leaves seldom divided, stem leaves usually sessile and clasping at the base. Flowers white, pink or purple, sometimes yellowish. Pod a linear silique, compressed parallel to the partition, valves usually nerved, seeds often winged, flattened, 1 or 2 rows in each cell.

1. *Arabis Drummondii* Gray. Drummond's rock cress.

Biennial, stem erect, simple, smooth, 1 to 2 feet tall; basal leaves spatulate, petioled, 1/2 to 1 inch long, entire or sparingly dentate, glabrous to sparingly pubescent with simple hairs; stem leaves sessile, clasping at the base, saggitate, glabrous; flowers small, white to pinkish, pods erect or ascending, smooth, short-pedicelated, 1 1/2 to 3 inches long, less than 1/16 inch wide; seeds oblong, winged, numerous, in two distinct rows.

## 20. CRASSULACEAE. Stone-crop Family

Succulent or fleshy, smooth herbs. Flowers regular, borne mostly in cymes. Petals and sepals usually 5. Fruit consisting of as many follicles as petals.

1. *Sedum* L.

Perennial herbs with alternate or opposite leaves. Flowers in terminal cymes. Petals 5. Stamens 10. Fruit consisting of several-seeded follicles.

Leaves spatulate, glaucous.....1. *Sedum spathulifolium*

Leaves not spatulate, not as above..2. *Sedum Douglasii*

1. Sedum spathulifolium Hook. Broad-leaved stone-crop. Whole plant very glaucous with a whitish bloom; stems decumbent, arising from a basal mat-like rosette; leaves broadly spatulate, thick, fleshy, flat; flowers borne in an open many-flowered cyme, pale yellow, nearly sessile; sepals 5, whitish-cream, united at the base; petals 5, narrow, longer than the sepals, yellow; stamens 10, 5 opposite the sepals and united to the base of the calyx, and 5 opposite the petals and attached to them; pistils 5, free or united at the base; follicles erect or nearly so.

2. Sedum Douglasii Hook. Douglas stone-crop. Stems erect, 4 to 10 inches tall, from a stout rootstalk, branching at the top; leaves lanceolate, narrow, acute at the apex, 1/2 to 1 inch long, green to occasionally reddish, somewhat fleshy, drying white-scarious when old; axils of the stem leaves commonly bearing short leafy branches which drop off and become the means by which the plant is propagated; flowers deep yellow, borne in an open cyme; petals narrow, lanceolate, longer than the stamens; follicles widely divergent.

## 21. SAXIFRAGACEAE. Saxifrage Family.

Perennial herbs or shrubs. Leaves alternate or opposite. Flowers perfect. Calyx usually 5-lobed. Petals commonly 5. Stamens 5 or 10, sometimes fewer, occasionally many. Ovary inferior or superior, 1- to 5-celled. Styles

and stigmas equal to the number of placentae. Fruit a capsule, follicle or berry.

### Herbs.

#### Stamens 5 or fewer

Stamens 3 or 2; petals 4, linear; flowers purple.....

.....1. *Tolmiea*

#### Stamens 5

Petals cleft, lobed or toothed....2. *Mitella*

Petals entire

Placentae axial.....3. *Boykinia*

Placentae parietal or nearly basal.....

.....4. *Heuchera*

#### Stamens 10

Placentae axial; ovary 2-celled.....5. *Saxifraga*

Placentae parietal; ovary 1-celled.....

Petals cleft, lobed, or toothed.....

.....6. *Tellima*

Petals entire, almost linear.....7. *Tiarella*

### Shrubs

#### Leaves opposite

Plant low, spreading or trailing....8. *Whipplea*

Plant erect, 4 to 10 feet tall.....9. *Philadelphus*

Leaves alternate.....10. *Ribes*

#### 1. *Tolmiea* T. and G.

Perennial herbs. Flowers in a terminal raceme.

Leaves chiefly basal. Petals 4 or 5, linear. Calyx tubu-



lar, unequally five-lobed, deeply cleft down one side. Pistil protruding. Stamens 3, sometimes 2. Ovary superior. Styles 2. Fruit a capsule.

1. Tolmiea Menziesii (Pursh.) T. and G. Youth-on-age. Stems slender, erect, 1 to 2 feet tall, usually several from the base; leaves ovate, cordate, or round-cordate, obscurely lobed, irregularly serrate, 2 to 40 inches broad, a bud at base of each blade; flowers purplish; stamens exerted.

## 2. Mitella L.

Perennial herbs with rootstalks and slender stems. Flowers very small, borne in spike-like racemes. Calyx tube half united with the ovary. Petals 5, white or greenish, cleft. Stamens 5. Filaments and styles very short. Fruit a capsule.

Petals white, 3-cleft at apex....1. Mitella trifida

Petals green, pinnately cleft into narrowly-linear divisions.

Leaves oblong to ovate, with scattered white hairs.....

.....2. Mitella ovalis

Leaves round-cordate, mainly glabrous.....

.....3. Mitella Breweri

1. Mitella trifida Graham. Three-toothed bishop's cap. Leaves all basal, stems 8 to 17 inches high; leaf blades round-reniform slightly lobed and crenate, 3/4 to 3 inches broad, with hairy, long, slender petioles; flowers white, petals 3-lobed or cleft at apex; stamens

alternate with the petals.

2. Mitella Breweri Gray. Brewer's bishop's cap.

Leaves all basal, stems 6 to 12 inches high; leaf blades glabrous or nearly so, round-cordate, shallowly lobed or toothed; petals divided into narrowly-linear divisions; stamens alternate with the petals and opposite the sepals.

3. Mitella ovalis Greene. Small bishop's cap.

Leaves all basal, stems 6 to 14 inches high, leaves oblong to ovate with scattered white hairs; petals greenish, pinnately cleft into narrowly linear divisions; stamens alternate with the petals.

3. Boykinia Nutt

Perennial herb with creeping rootstalks. Stems simple, bearing alternate leaves and perfect flowers in axillary and terminal panicles or cymes. Petals five, deciduous. Stamens 5, short. Fruit a 2-beaked capsule.

Stipules reduced to bristles.....1. Boykinia elata

Stipules scarious or leaf-like....2. Boykinia major

1. Boykinia elata (Nutt.) Greene. Slender Boykinia.

Stems slender, 1 1/2 to 2 feet tall, sparsely hairy with reddish glandular hairs; stipules reduced to bristles, leaves 1 to 4 inches broad, lobes acute, coarsely toothed with long petioles; flowers in a loose axillary or terminal panicle or cyme; petals white.

2. Boykinia major Gray. Large Boykinia. Stem coarse and stout, 2 to 4 feet high, sparsely hairy, somewhat

glandular, the lower stipules membranous, the upper distinctly leaf-like; peduncles axillary, 6- to 12-flowered; leaves round-cordate, 4 to 8 inches broad, 5- to 9-cleft, the lobes coarsely incised or toothed; calyx-tube campanulate or urn-shaped, the lobes triangular; petals obovate, white.

#### 4. *Heuchera* L.

Perennial herbs with stout rootstalks. Leaves mostly basal. Flowers borne in a panicle of small cymes. Petals minute, entire, greenish or whitish. Stamens 5. Ovary half-inferior. Fruit a 1-celled, 2-beaked, many-seeded capsule.

1. *Heuchera glabra* Willd. Smooth alum-root. Stems slender, erect; leaves roundish, thin, glabrous, deeply and sharply 5- to 8-lobed or toothed, mostly basal; petioles glabrous or nearly so; stem leaves usually 3 or 4, similar to basal leaves but smaller; flowers small, borne in a loose panicle of cyme-like clusters, stalks glandular-hairy; petals whitish, spatulate, mostly longer than the calyx; stamens exserted.

#### 5. *Saxifraga* L.

Perennial or annual herbs with mostly or entirely basal leaves. Flowers in loose panicles or close clusters. Petals 5, entire. Stamens 10. Styles 2. Ovary nearly superior or slightly inferior. Fruit a 2-beaked, 2-celled capsule or sometimes consisting of 2 nearly separate fol-

licles.

Low tufted plants with perennial branches, densely covered with small leaves; flowers orange-spotted.....

.....1. *Saxifraga bronchialis*

Plants not tufted, not as above.

Leaves all basal.....2. *Saxifraga rudifula*

Leaves not all basal.

Plants with roundish leaves, usually doubly toothed..

.....3. *Saxifraga Mertensiana*

Plants with spatulate leaves, toothed above the middle

.....4. *Saxifraga Bongardii*

1. *Saxifraga bronchialis* L. Matted saxifrage. Plants tufted; stems 1 to 3 inches tall, branching erect or ascending, bearing small leaves; basal leaves densely crowded, leathery, lanceolate to spatulate, acute, spiny-tipped, ciliate on the margins; flowers in a loose few-flowered cyme, white with orange spots; beaks of the follicles widely spreading when mature.

2. *Saxifraga rudifula* (Small.) Piper Red-woolly saxifrage. Stems 2 to 6 inches long from a basal rosette; leaves thick, oblong-ovate, crenate, bright green and glabrous above, densely rusty-reddish beneath with conspicuous reddish hairs, at least while young; cyme spreading, few-flowered; flowers white, 1/4 inch wide; filaments dilated at base or below the middle.

3. *Saxifraga Mertensiana* Bong. Merten's saxifrage. Stems slender, branched, 3 to 12 inches tall, glandular

and minutely hairy; leaves round-reniform, several-lobed, the lobes doubly toothed; inflorescence a loose paniced cyme; the branches slender, glandular-hairy, bearing a flower at the tip and bulblets below; sepals turned back; flowers  $1/4$  inch wide; filaments dilated at the summit.

4. Saxifraga Bongardii Presl. Bongard's Saxifrage.

Stems 4 to 12 inches tall; leaves mostly in a basal rosette, minutely hairy, spatulate and glandular, toothed above the middle; inflorescence a loose spreading panicle of white-flowered cymes; flowers approximately  $1/4$  inch wide, some of them often replaced by bulblets; petals unequal, white with two yellowish spots at the base.

6. Tellima R. Br.

Perennial herb with creeping root-stalks. Stems simple. Flowers in a raceme. Petals 5, white, pink or reddish. Stamens 10. Ovary inferior. Styles 2 or 3, very short. Ovary 1-celled, with 2 or 3 parietal placentae.

1. Tellima grandiflora (Pursh) Dougl. Fringe-cups.

Stems usually one, 1 to 2 feet tall; basal leaves roundish, shallowly 5- to 9-lobed, the lobes toothed, heart-shaped at base, sparsely hairy, inflorescence a somewhat one-sided raceme; flowers nodding; petals reflexed, white, pink or reddish.

7. Tiarella L.

Slender perennial herbs; flowers small, white, in a terminal raceme or panicle. Petals 5, entire, small,

narrow. Stamens 10, exserted. Ovary 2-beaked, united at base with the calyx. Fruit an unequally-valved thin capsule.

Leaves simple, toothed.....1. *Tiarella unifoliata*

Leaves compound, 3 leaflets...2. *Tiarella trifoliata*

1. *Tiarella unifoliata* Hook. Cool-wort. Stems 1 to several, 10 to 20 inches tall; basal leaves 3- to 5-lobed, cordate, toothed, sparsely hairy, long-petioled; stem leaves few, scarcely petioled; flowers small, white, in a narrow elongated panicle; capsule valves conspicuously unequal.

2. *Tiarella trifoliata* L. Three-leaved cool-wort. Stems 1 to several, 8 to 24 inches tall, basal leaves distinctly divided into 3 leaflets, the middle leaflet obovate, 3-toothed, the lateral leaflets oblique; stem leaves similar, smaller, scarcely petioled; flowers white, narrow, in an elongated panicle.

#### 8. *Whipplea* Torr.

Low prostrate shrubs with trailing or creeping stems and opposite, short-petioled leaves. Flowers white, borne in clustered terminal panicles. Calyx 5-cleft. Petals 5, contracted at the base. Stamens usually 10. Ovary 3- to 5-celled, partially inferior. Fruit a capsule.

1. *Whipplea modesta* Torr. Whipple-vine. Stems woody, trailing, erect branches 3 to 5 inches tall; leaves oval to ovate, 3 conspicuous veins from the base, minutely hairy,

slightly toothed, short petioled or none; flowers white soon becoming greenish, 4 to 9, arranged in small cymes; ovary partly inferior; capsule globular.

#### 9. *Philadelphus* L.

Shrubs with opposite, deciduous leaves and perfect flowers. Calyx lobes 4- or 5-parted. Petals 4 or 5. Stamens many. Ovary inferior, 4-celled. Fruit a capsule, splitting into 4 valves.

##### 1. *Philadelphus Gordonianus* Lindl. Mock orange.

Shrub 4 to 15 feet tall; leaves ovate, acuminate, entire or slightly toothed, smooth or somewhat hairy on the under surface; flowers very fragrant, white, showy, arranged in cymes; styles united for one-half or two-thirds their length.

#### 10. *Ribes* L.

Shrubs with or without spines or prickles. Leaves alternate, palmately veined and lobed. Flowers in racemes or solitary, the pedicels with bractlets. Flowers parts usually in 5's. Ovary inferior. Style 2-cleft. Placentae 2, parietal. Fruit a berry.

Stems without spines or prickles

Flowers bell-shaped, pink or red, showy.....

.....1. *Ribes sanguineum*

Flowers saucer-shaped, greenish, inconspicuous.....

.....2. *Ribes bracteosum*

Stems with spines and sometimes prickles

Calyx spreading or saucer-shaped; berry with gland-tipped hairs.....3. *Ribes lacustre*

Calyx bell-shaped or cylindrical; berry with sharp, unequal spines.....4. *Ribes binominatum*

1. *Ribes sanguineum* Pursh. Red-flowering currant.

Shrub with much branched slender stems, 2 to 6 feet tall, leaves shallowly 3- to 5-lobed, finely and irregularly toothed, green above, pale pubescent below, conspicuously veined; flowers deep red to pale pink; berries blue-black with stalked glands and a conspicuous waxy bloom.

2. *Ribes bracteosum* Dougl. Stinking black currant.

Shrub 5 to 10 feet tall; leaves deeply 5- to 7-lobed, at least 4 inches wide, irregularly toothed, cordate at the base, glandular beneath; flowers greenish, inconspicuous, saucer-shaped, in slender racemes 5 to 15 inches long; berries black, sprinkled with resin dots and white waxy bloom.

2. *Ribes lacustre* (Pers.) Poir. Swamp currant.

Stems prostrate or ascending 3 to 5 feet tall armed with spines and numerous bristly prickles; leaves 1 to 2 inches broad, 5-lobed, the lobes incised, glabrous or nearly so; inflorescence an erect raceme drooping later, 5- to 15-flowered; calyx spreading, saucer-shaped, greenish to purplish; stamens very short; berries black, bearing gland-tipped hairs.



4. Ribes binominatum Heller. Siskiyou gooseberry.

Stem trailing, 2 to 4 feet long, not bristly, but with 3 unequal nodal spines; leaves 3- to 5-lobed, 1/2 to 3 inches wide, glabrous or weakly pubescent and glandular above, silky-pubescent below; calyx with a short greenish-white tube; stamens little exceeding the petals; berry usually glandular, covered with stout, straw-colored, unequal spines.

## 22. ROSACEAE Rose Family

Herbs, shrubs or trees generally with alternate leaves. Stipules commonly present. Flowers regular, usually perfect. Calyx 5- to 10-lobed, usually 5 or sometimes 4. Petals 5, or as many as the sepals, rarely none. Stamens 10 or numerous. Pistils 1 to many, simple or compound. Fruit dry or fleshy.

Shrubs or trees.

Fruits enclosed in an urn-shaped, globose receptacle...

.....1. Rosa

Fruits not enclosed as above

Ovary inferior; fruit a pome

Fruits blue-black; leaves simple; flowers in racemes

.....2. Amelanchier

Fruits red; leaves compound; flowers in corymbs.....

.....3. Pyrus

Ovary not inferior

Pistil 1.....4. Prunus

Pistil more than 1

Fruit dry, a follicle....5. Holodiscus

Fruit fleshy, an aggregate berry.....

.....6. Rubus

### Herbs

Flowers very small, borne in plume-like panicles,  
stamens and pistils borne on separate plants.....

.....7. Aruncus

Flowers larger, not borne in plume-like panicles,  
usually perfect

Flowers white; fruit fleshy..8. Fragaria

Flowers yellow; fruit dry....9. Potentilla

#### 1. Rosa L.

Spiny or prickly shrubs with stipulate, pinnately compound leaves. Flowers large, showy, solitary or in corymbs. Petals generally 5, obovate. Sepals 5. Stamens many. Pistils several to many, enclosed in the receptacle. Fruit consisting of several hard achenes.

1. Rosa gymnocarpa Nutt. Wood rose. Stems erect, 1 to 4 feet tall, bristly or sparingly covered with needle-like prickles; leaves divided into 5 to 7 leaflets; leaflets round-ovate to elliptic, 1/4 inch to 1 inch long, doubly-serrate with gland-tipped teeth, smooth on both sides; flowers 3/4 to 1 inch wide; petals pink with

whitish bases; fruit elliptical or rarely roundish, bright red.

## 2. Amelanchier Medic.

Shrubs or trees with simple toothed leaves and white flowers borne in terminal racemes. Sepals 5. Petals 5. Stamens many. Ovary partly inferior. Styles 4 or 5. Fruit a roundish, usually bluish-black berry-like pome.

### 1. Amelanchier alnifolia Nutt. Service berry.

Shrubs 3 to 15 feet tall; leaves oval or roundish, toothed above the middle, sparsely hairy above, paler beneath, occasionally densely hairy; racemes dense, short; petals narrow; calyx white-hairy below the lobes; fruit roundish, purple to black.

## 3. Pyrus L.

Small trees or shrubs with simple or compound deciduous leaves. Flowers white or pink in broad terminal compound corymbs. Sepals 5. Petals 5. Stamens usually 20. Ovary inferior, 2- to 5-celled. Styles 2 to 5. Fruit a berry-like pome.

Leaves toothed almost entire length. 1. *Pyrus sitchensis*

Leaves toothed above the middle or near the apex.....

.....2. *Pyrus occidentalis*

### 1. Pyrus sitchensis (Roem.) Piper. Mountain ash.

Shrub 6 to 15 feet tall; leaves petioled, 6 to 10 inches long, pinnately compound; leaflets 9 to 11, oval or oblong,

acute at the apex, sharply toothed almost the entire length; flowers white, borne in dense compound cymes; fruits roundish, scarlet.

2. Pyrus occidentalis Wats. Small mountain ash.

Shrub 3 to 5 feet tall; leaves petioled, pinnately compound; leaflets 7 to 11, oblong, obtuse, toothed near the end or above the middle; flowers white, small, borne in almost simple corymbs; fruit elliptical, red.

4. Prunus L.

Trees or shrubs with simple, toothed leaves and usually white flowers. Calyx 5-lobed, deciduous. Petals 5. Stamens many. Pistil 1. Fruit a drupe, usually 1-seeded.

1. Prunus emarginata (Dougl.) Walp. Wild Cherry.

A small bush 4 to 8 feet tall, sometimes larger and tree-like, forming brushy thickets; bark red-brown with conspicuous lenticels; leaves ovate to oval, usually obtuse, pubescent or sometimes smooth beneath, finely toothed, 1 to 3 inches long; flowers in racemes; fruit a bitter, dark red drupe.

5. Holodiscus Maxim.

Shrubs with pinnately veined, toothed or lobed leaves. Flowers small, whitish, borne in a dense terminal panicle. Sepals 5. Petals 5. Stamens 20. Fruits of 1-seeded, hairy follicles.

Plant erect; leaves minutely hairy beneath.....

.....1. *Holodiscus discolor*

Plant diffuse; leaves glandular-dotted beneath.....

.....2. *Holodiscus glabrescens*

1. *Holodiscus discolor* (Pursh.) Maxim. Ocean spray.

Shrubs 3 to 8 feet tall, erect; leaves triangular-ovate, toothed or lobed, usually rather truncate at the base, minutely hairy beneath, green above, sparsely hairy or smooth, 3/4 to 2 inches long; panicle erect or drooping, pyramid-shaped.

*Holodiscus glabrescens* (Greene.) Hel. Dwarf ocean spray. Very closely resembling *Holodiscus discolor* but diffuse, much smaller, growing at higher elevations; leaves glandular-dotted, minutely covered with small hairs, especially beneath.

## 6. *Rubus* L.

Herbs or shrubs with erect or sometimes trailing or climbing, smooth or prickly stems. Leaves alternate, simple or pinnately compound. Flowers white, sometimes pinkish or red. Sepals 5. Petals 5. Stamens numerous. Pistils many. Fruit an aggregate of usually many-seeded drupelets.

Stems creeping or trailing.

Stems unarmed, not prickly

Leaves compound, with 3 to 5 leaflets.....

.....1. *Rubus pedatus*

Leaves merely 3- to 5-lobed...2. *Rubus lasiococcus*

Stems prickly.....3. *Rubus macropetalus*

Stems erect.

Flowers red, rarely pinkish; fruit yellowish-orange;

leaves compound.....4. *Rubus spectabilis*

Flowers white; fruit red; leaves simple, palmately lobed.

.....5. *Rubus parviflorus*

1. *Rubus pedatus* Smith. Trailing raspberry. A creeping plant; leaves palmately compound; leaflets 3 to 5, obovate, 1/2 to 1 inch long, cuneate at the base, coarsely doubly toothed on the margins; flowers solitary, white, around 1/2 inch wide; fruit red, glabrous.

2. *Rubus lasiococcus* Gray. Dwarf raspberry. Creeping or trailing plant very closely resembling *Rubus pedatus* but leaves not compound, merely 3- to 5-lobed; fruit red, fuzzy or pubescent.

3. *Rubus macropetalus* Dougl. Wild blackberry. Stems somewhat woody, prickly, trailing or climbing, 4 to 20 feet long; leaves with 3 to 5 leaflets or sometimes simple and lobed; leaflets ovate, acute at apex, coarsely toothed, minutely hairy or smooth; flowers white, 3/4 to 1 inch wide; buds glandular and minutely hairy; fruits shiny black, with excellent flavor.

4. *Rubus spectabilis* Pursh. Salmon-berry. Stems 2 to 8 feet tall, prickly; leaves divided into 3 ovate leaflets, more or less coarsely toothed and lobed, with promi-

ment veins; flowers solitary or few, red or sometimes pinkish; fruit yellowish to orange-red.

5. Rubus parviflorus Nutt. Thimbleberry. Stems 2 to 5 feet tall; leaves large, cordate, palmately 5-lobed, 3 to 8 inches wide, unevenly toothed, densely or sparsely covered with minute hairs; flowers large, several, white, 1 1/2 to 2 inches wide, in a loose terminal corymb; fruit red or scarlet, the drupelets separating and falling soon after ripening.

#### 7. Aruncus L.

Erect perennial herb with thick rootstalks and 2- to 3-pinnately compound leaves. Flowers small, white, borne in large plume-like panicles. Sepals 5. Petals 5. Stamens many. Pistils 3. Fruits made up of 3 reflexed, 2-seeded follicles.

1. Aruncus sylvester Kost. Goat's beard. Stems erect 2 1/2 to 5 feet tall, smooth; leaves ovate to lanceolate, acute at apex, doubly-toothed, obtuse at the base; flowers minute; sepals smaller than the whitish petals; stamens exserted, attached to the calyx.

#### 8. Fragaria L.

Perennial herbs with thick rootstalks and long slender runners or stolons. Leaves compound, consisting of 3 leaflets. Petals 5, white, occasionally pinkish. Sepals 5. Stamens many. Fruit made up of the enlarged receptacle which becomes juicy and bears numerous seed-like achenes

on the surface.

1. Fragaria bracteata Heller. Wood strawberry. Stems erect, 5 to 10 inches tall, 2- to 8-flowered, usually longer than the leaves; whole plant more or less silky-hairy throughout; leaflets thin, 3/4 to 2 inches long, coarsely toothed; fruit oval to elliptical, bright red.

### 9. Potentilla L.

Perennial or occasionally annual, herbs or shrubs with compound leaves. Flowers commonly yellow, borne in cymes or solitary. Sepals 5-lobed, with 5 alternating bractlets. Petals 5. Stamens 10 to many, sometimes 5. Pistils several to many, becoming achenes.

Leaves palmately compound; leaflets all from the summit

of the petiole.....1. Potentilla gracilis

Leaves pinnate; leaflets more or less scattered on an

elongated rachis

Leaflets ovate, simply toothed..2. Potentilla glandulosa

Leaflets deeply cleft or incised

Herbage green.....3. Potentilla Drummondii

Herbage silvery.....4. Potentilla Breweri

1. Potentilla gracilis Dougl. Five-finger. Stem erect, 1 to 2 feet tall with long, white hairs; leaves palmately divided into 5 to 7 leaflets from the summit of the petiole; basal leaves long petioled; leaflets 1 1/2 to 3 inches long, narrowly oblanceolate, deeply toothed,



dark green above, densely white-hairy on the under surface; flowers bright golden yellow; petals much longer than the sepals.

2. Potentilla glandulosa L. Sticky cinquefoil...Stems erect, 1 to 2 feet tall, glandular and sparsely villous, almost simple below, loosely branched above; basal leaves pinnately compound with 5 to 9 broadly ovate, simply toothed leaflets scattered along the rachis; flowers 1/2 inch wide, yellow, borne in somewhat loose cymes; inflorescence glandular; petals round-ovate, broad, as long as or longer than the sepals.

3. Potentilla Drummondii Lehm. Drummond's cinquefoil. Stems erect or nearly so, 5 to 16 inches high, minutely hairy, herbage green; basal leaves on petioles 1 1/2 to 5 inches long; leaflets 5 to 11, obovate to roundish, cleft or incised, somewhat hairy; flowers bright yellow in loose cymes; petals about twice as long as the sepals.

4. Potentilla Breweri Wats. Brewer's cinquefoil. Stems spreading or diffuse, 2 to 10 inches long; herbage densely silky-villous or silvery, especially the leaves; leaves pinnate, the leaflets crowded or discrete, deeply incised 7 to 9 times; flowers yellow; petals roundish or obcordate.

### 23. LEGUMINOSAE. Pea Family.

Herbs, shrubs or trees with alternate compound leaves. Stipules generally present. Calyx of 4 or 5 partly united

sepals, or sometimes 2-lipped. Petals usually 5, unequal in size, irregular, consisting of 1 banner, 2 wings and a keel of 2 petals. Stamens usually 10, generally united in a sheath around the pistil or the upper stamen separate and free from the others, sometimes all free. Pistil simple, superior, 1-loculed, with 1 row of seeds, the pod dehiscing along both sutures. Fruit a legume.

Leaves palmately compound

Leaflets 5 or more, entire....1. *Lupinus*

Leaflets 3, not entire.....2. *Trifolium*

Leaves pinnately compound

Tendrils none.....3. *Lotus*

Tendrils usually present

Style filiform, ending in hairy, capitate stigma.....

.....4. *Vicia*

Style flattened, hairy only on the upper side.....

.....5. *Lathyrus*

1. *Lupinus L.*

Herbs or shrubs with palmately compound leaves. Leaflets generally 5 or more. Flowers in racemes. Calyx 2-lipped. Stamens 10, united to form a sheath around the pistil. Pods oblong, somewhat flattened, several-seeded. Plants short, low; herbage silky.....

.....1. *Lupinus Torreyi*

Plants tall, erect; herbage green, villous or smooth; not silky

Keel not ciliate.....2. *Lupinus Andersonii*

Keel ciliate on the upper margins.....

.....3. *Lupinus latifolius*  
var. *subalpinus*

1. *Lupinus Torreyi* Gray. Torrey's lupine. Stems short, 5 to 8 inches tall; herbage appressed silky; leaves long-petioled, crowded at the base; leaflets 6 to 8, appressed-silky on both sides, 1/2 to 1 inch long; flower stems ascending or erect, usually exceeding the foliage; flowers in a dense cylindrical raceme; bracts persistent; flowers violet blue, banner oval to ovate, glabrous, keel only minutely curved, ciliate on upper margins; pods silky.

2. *Lupinus Andersonii* Wats. Anderson's lupine. Stems stout, branched, 2 to 3 feet tall; petioles about as long as the leaflets; banner and wings very broad; the keel scarcely or not at all exposed; banner obtuse or rounded at apex; keel non-ciliate; petals blue, purplish or sometimes whitish.

3. *Lupinus latifolius* Lindl. var. *subalpinus* (Pip. Rob.) CP. Sm. Alpine lupine. Stems erect, simple, nearly unbranched, 1 to 2 feet tall; leaflets 5 to 7, minutely hairy beneath, green and glabrous above or more or less villous, oblanceolate to elliptic; flowers blue; keel ciliate on the upper margins.

2. *Trifolium* L.

Herbs with palmately compound leaves of 3 leaflets. Flowers in heads. Stamens 10, nine united into a sheath, the tenth free. Pod small, 1- to several-seeded, included in the persistent calyx.

Stems creeping, rooting at the nodes.....

.....1. *Trifolium repens*

Stems erect, not rooting at the nodes.....

.....2. *Trifolium Howellii*

1. *Trifolium repens* L. White clover. Stems several creeping, smooth; leaves long-petioled; leaflets glabrous, heart-shaped at apex, minutely toothed; heads round, 1/2 to 1 1/2 inch broad; flowers white or sometimes pinkish becoming reflexed and brownish with age; calyx teeth shorter than the corolla.

2. *Trifolium Howellii* Wats. Howell's clover. Stems nearly simple, stout, erect, 2 to 3 feet tall, stipules large, leaf-like, ovate; leaflets elliptic to elliptic-ovate, 1 1/2 to 2 1/2 inches long; heads ovate or oblong; flowers white, conspicuously reflexed with age.

3. *Lotus* L.

Herbs occasionally woody at the base. Leaves alternate, pinnately compound with 3 to several leaflets. Flowers solitary or in umbels, usually with leafy bracts. Petals of the keel with a lobe at the base of the blade.

Nine stamens united, one free. Pods straight or curved, 1- to many-seeded.

1. Lotus crassifolius (Benth.) Greene. Pink trefoil. Stems erect, smooth, 1 to 2 feet tall; leaflets elliptic, ovate or obovate; flowers dull purple to reddish, borne in one-sided umbels; pods slightly curved, 1 1/2 to 2 1/2 inches long, several- to many-seeded.

4. Vicia L.

Annual or perennial herbs with usually climbing or trailing stems. Leaves pinnately compound, mostly ending in tendrils. Flowers in racemes or solitary. Calyx unevenly 5-toothed. Nine stamens united and one free. Style filiform ending in a hairy capitate stigma. Pod flattened, 2- to several-seeded.

1. Vicia americana Muhl. American vetch. Stem trailing or ascending, 1 to 2 feet long, strongly 4-angled; leaflets oval or oblong, smooth or minutely hairy, obtuse or sometimes truncate at apex; stipules usually deeply incised; flowers bluish-purple, 3 to 8, borne on peduncles shorter than the leaves; pods elongated 1 to 2 inches long, glabrous; seeds dark-brown to black.

2. Vicia americana Muhl. var. truncata Brew. Leaves strongly square cut across the top and sometimes several-toothed.

5. *Lathyrus* L.

Herbs similar to *Vicia*, but with usually broader banners, larger leaflets and sometimes imperfectly developed tendrils. Style curved, flattened and hairy only on the upper side.

1. *Lathyrus Nuttallii* Wats. Nuttall's Pea. Stems slender, angled, mostly erect, 1/2 to 3 feet tall; leaflets 4 to 14, oval, ovate or elliptic, mucronate, pubescent beneath; tendrils simple, short; racemes 4- to 8-flowered, pale purple; calyx minutely hairy; pods glabrous.

## 24. LINACEAE. Flax Family

Herbs or sometimes shrubs with alternate or opposite, small, simple, entire leaves. Flowers usually in cymes or panicles. Sepals generally 5. Petals mostly 5. Stamens 5 or as many as the petals, slightly united at the base. Styles 2 to 5. Ovary 2- to 5-celled or twice as many by false partitions. Fruit a capsule.

1. *Linum* L.

Annual or perennial herbs with alternate or opposite leaves, without stipules. Sepals 5. Petals 5. Stamens 5. Styles 5. Ovary 5-celled or 10-celled by the dividing of false partitions. Fruit a 10-valved capsule.

1. *Linum lewisii* Pursh. Blue Flax. Stems with a woody base, simple below, more or less branched above; leaves many, alternate, narrowly-linear, very acute at

apex; stipules none; flowers few in a narrow cyme; sepals ovate, veined, usually entire, acuminate; petals pale blue, obovate; capsule globose, eventually dehiscent by 10 valves.

#### 25. OXALIDACEAE. Oxalis Family

Herbs with palmately compound leaves consisting of 3 leaflets. Ovary 5-celled, superior. Styles 5. Fruit a capsule.

##### 1. *Oxalis* L.

Herbs with leaves consisting of 3 leaflets and regular, perfect flowers. Flower solitary or a few in an umbel. Sepals and petals 5. Stamens 10. Capsule 5-angled.

1. *Oxalis oregana* Nutt. Wood sorrel. Perennial herbs with horizontal rootstalks; stems 4 to 6 inches tall; leaflets obovate at apex, smooth above, sparsely villous beneath at least on the veins; flowers white or pinkish, 3/4 to 1 inch long, solitary; peduncle bearing 2 bracts above the middle.

#### 26. CELASTRACEAE. Burning Bush Family

Shrubs with simple alternate or opposite leaves with angled stems. Flowers minute, regular, perfect. Petals and sepals 4 to 5. Calyx deeply lobed. Stamens 5, alternate with petals and attached to a disk. Stigma 2- to 5-lobed. Ovary 2- to 5-celled, surrounded by the disk. Fruit a capsule.

1. *Pachistima* Raf.

Small evergreen shrubs with 4-angled stems and opposite leaves. Flowers perfect, reddish or greenish. Sepals, petals and stamens all 4. Ovary surrounded by the disk. Capsule 2-celled.

1. *Pachistima myrsinites* (Pursh.) Raf. Oregon box-wood. Evergreen shrub 1 to 3 feet tall, glabrous throughout; stems branching profusely; leaves oval to obovate, many, opposite, leathery, small, serrate, short-petioled; flowers minute, yellowish to reddish.

## 27. ACERACEAE. Maple Family

Trees or shrubs with opposite leaves. Flowers regular, perfect or sometimes imperfect. Calyx usually 5-cleft. Petals as many as the sepals or none. Stamens 3 to 10, borne on a disk when the pistil is present. Ovary superior, 2-loculed, 2-lobed with 2 styles, developing into a double samara.

1. *Acer* L.

Trees or shrubs with deciduous, palmately lobed or pinnately compound leaves. Flowers in racemes, panicles or corymbs, the cluster always drooping.

Leaves 7- to 9-lobed; wings of fruit spreading at right angles to the stalk.....1. *Acer circinatum*

Leaves 3- to 5-lobed; wings of fruit ascending.....  
.....2. *Acer Douglasii*



1. Acer circinatum Pursh. Vine maple. Small tree or large shrub usually bent and reclining but sometimes erect, 5 to 20 feet tall; leaves palmately 7- to 9-lobed, cordate at the base, 2 to 4 inches wide; flowers 4 to 20 in a corymb; sepals dark-red to purplish; petals white, shorter than the sepals; stamens 6 to 10, longer than the corolla filaments, glabrous above, covered with hairs at the base; wings of the fruit spreading at right angles to the stalk.

2. Acer Douglasii Hook. Dwarf maple. Small tree or shrub 6 to 10 feet high; leaves similar in appearance to A. circinatum but 3- to 5-lobed, paler beneath; flowers greenish yellow; sepals and petals about equal and more or less alike; wings of the fruit ascending, not widely spreading.

## 28. HYPERICACEAE. St. John's Wort Family

Herbs (in our area) with opposite, entire, glandular leaves. Sepals and petals usually 5 or 4. Stamens several to many, distinct or grouped into 3 to 5 clusters. Ovary superior, 1- or 3-celled. Styles 3. Fruit a capsule.

### 1. Hypericum L.

Perennial or annual herbs. Leaves sessile. Flowers borne in cymes. Sepals 5. Petals 5, yellow.

Low annual, forming mats; flowers minute, 1/4 inch wide..

.....1. Hypericum anagalloides

Tall perennial, erect; flowers large, 1 inch wide.....

.....2. Hypericum perforatum

1. Hypericum anagalloides C. and S. Water St. John's Wort. Plants with numerous, weak, procumbent or ascending stems, usually forming dense mats; leaves minute, broadly ovate to elliptic or obovate; flowers  $1/4$  inch wide, orange-yellow, in small cymes; stamens 15 to 20.

2. Hypericum perforatum L. St. John's Wort. Stem stout, erect, 1 to 2 feet tall, usually bearing many leafy sterile shoots from the base; leaves linear to oblong, obtuse, glandular with black dots, margins soon turning backward; flowers 1 inch wide, borne in a cyme 3 to 12 inches broad; petals narrow, bright yellow, conspicuously black-dotted; sepals narrow, acute, half as long as the petals or less.

## 29. VIOLACEAE. Violet Family

Perennial herbs with simple alternate or basal leaves. Stipules persistent. Flowers perfect, irregular. Sepals 5. Petals 5, the lower one usually spurred at the base. Stamens 5, with flattened filaments bearing the anthers on their inner face. Ovary superior, 1-celled. Fruit a 3-valved capsule.

### 1. *Viola* L.

Flowers solitary on axillary pedicels. Sepals unequal. Stamens 5, the 2 lower with spurs prolonged into the spur of the lower petal. Capsule 3-valved, many-seeded. Seeds forcibly ejected from the capsule at maturity.

1. Viola glabella Nutt. Wood violet. Stems erect, 3 to 12 inches tall from a horizontal rootstalk; leaves ovate, heart-shaped, acute at apex, margins with rounded teeth; lower leaves broadly reniform on long petioles; flowers bright yellow the lower purple-veined at the base.

### 30. ONAGRACEAE. Evening Primrose Family

Annual or perennial herbs with simple opposite or alternate leaves. Flower parts in 4's or in 2's. Ovary inferior. Fruit a many-seeded capsule, rarely bur-like or nut-like.

Parts of the flower in 4's; fruit a capsule

Seeds with a tuft of hairs at one end.....

.....1. *Epilobium*

Seeds without tuft of hairs

Calyx tube absent; flowers small.2. *Gayophytum*

Calyx tubes present; flowers showy.....

.....3. *Godetia*

Parts of the flower in 2's; fruit bur-like.....

.....4. *Circaea*

#### 1. *Epilobium* L.

Annual or perennial herbs with alternate or opposite leaves. Flowers borne axillary or terminally, in spikes or racemes, sometimes solitary. Petals 4. Sepals 4. Stamens 8. Capsule many-seeded, slender, each seed with a tuft of hairs at the upper end.

Flowers showy; petals spreading, entire.....

.....1. *Epilobium angustifolium*

Flowers small; petals not spreading, cleft

Annuals; stigma 4-cleft.....2. *Epilobium paniculatum*

Perennials; stigma entire

Mostly lowland plants 1 to 3 feet or more tall.....

.....3. *Epilobium adenocaulon*

Mostly mountain plants less than 12 inches high

Stem simple but tufted; flowers nodding.....

.....4. *Epilobium alpinum*

Stem only one from the base; flowers not nodding.

.....5. *Epilobium Hornemannii*

1. *Epilobium angustifolium* L. Fireweed. Perennial, stems erect, 2 to 5 feet tall, minutely hairy above, smooth below; leaves many, alternate, long-lanceolate, nearly sessile, green above, paler beneath, entire or scarcely toothed; flowers rose-purple borne in terminal spikes or racemes; capsule narrow, spreading.

2. *Epilobium paniculatum* Nutt. Tall willow herb. Annual, stem erect, 2 to 4 feet tall, much branched above; leaves 1 to 2 inches long, alternate, linear or narrowly lanceolate; flowers pink or white in loose racemes; petals small, deeply notched; capsule 4-angled; seeds roughened, tuft of hair white.

3. *Epilobium adenocaulon* Hausskn. Common willow herb. Perennial, stems erect, 1 to 2 feet tall, smooth or

slightly hairy above, glabrous below, inflorescence sometimes glandular-pubescent; plant producing short stolons which develop fleshy basal rosettes in the fall; leaves opposite or sometimes alternate above, lanceolate, 1 to 3 inches long, serrate; smooth or slightly glandular-hairy, rounded or cordate at the base, short-petioled; flowers numerous, white to pinkish; petals small, notched; capsule linear, sessile or nearly so; seeds papillose, tuft of hairs white.

4. Epilobium alpinum L. Alpine willow herb. Stems usually many, erect or somewhat decumbent, glabrous or hairy in lines, 3 to 10 inches tall; leaves oval, obtuse, slightly toothed or almost entire, mostly opposite; flowers small, white or sometimes rose-colored, nodding.

5. Epilobium Hornemannii Reichenb. Hornemann's willow herb. Stems erect, usually solitary, 6 to 12 inches tall; leaves ovate, short-petioled, 1 to 1 1/2 inches long, toothed, lower ones opposite, upper ones alternate; flowers pink to purplish, 1/4 to 1/2 inch long.

## 2. Godetia Spach.

Annuals, usually erect. Leaves alternate, sessile or short petioled. Flowers usually showy, in racemes or spikes. Petals mostly broad, 4. Stamens 8 in 2 series, those opposite the petals shorter. Capsule linear, rounded or 4-angled, 4-valved.

1. Godetia ameona (Lehm.) Lilja. Wild Godetia.

Sparsely short-hairy; stem erect, 1/2 to 3 feet tall; leaves linear to lanceolate, entire; flowers showy, more or less erect or scarcely nodding; calyx tips united, usually splitting on one side only, lobes generally remaining attached and not reflexed; petals truncate or obtuse at apex, obovate, pink or rose-purple, sometimes with a crimson blotch near the base; filaments purplish; anthers purplish, curved, often with a yellow tip; stigmas yellow, linear, minutely hairy; capsule ribbed, slender, tapering at each end, sometimes curved.

3. Gayophytum Juss.

Slender annuals with alternate, linear, entire leaves and small axillary flowers. Sepals 4, deciduous. Petals 4, very small. Stamens 8 in 2 series. Capsule terete, 2-celled.

1. Gayophytum ramosissimum T. and G. Hair-stem gayophytum. Stems erect, slender, much branched above, 1/2 to 1 1/2 feet tall; leaves linear; flowers very minute; petals white to pinkish; seeds smooth.

4. Circaea L.

Small perennial herbs with petioled opposite leaves. Flowers small, white, borne in terminal or axillary racemes, parts of the flower in twos. Fruit small, bur-like, covered with hooked bristles.

1. Circaea pacifica Asch. and Magn. Enchanter's nightshade. Stem usually simple, 6 to 12 inches tall, from a small somewhat fleshy root-stalk; leaves broadly ovate, long-petioled, sparsely toothed; flowers minute, white; fruits small, covered with hooked bristles.

31. UMBELLIFERAE. Parsley Family

Herbs with generally hollow stems and small flowers in simple or compound umbels. Calyx tube united to the ovary, the teeth very minute or absent. Petals 5, usually clawed. Stamens 5, united to the margin of the disk. Ovary inferior. Fruit a schizocarp consisting of 2 dry, seed-like carpels.

Fruits linear, several times as long as wide.....

.....1. Osmorhiza

Fruits oblong or roundish

Fruits with hooked bristles.....

.....2. Sanicula

Fruits smooth, not as above

Flowers yellow (ours)....3. Lomatium

Flowers white, pinkish or purple

Fruits winged

Plants 4 to 8 feet tall; flowers white.....

.....4. Heracleum

Plants smaller, usually under 4 feet tall; flowers

purple.....5. *Leptotaenia*

Fruits not winged.....6. *Ligusticum*

1. *Osmorhiza* Raf.

Perennial herbs with aromatic roots and ternately compound leaves. Flowers white or purple in compound umbels. Calyx teeth missing. Fruit linear, glabrous or bristly on the ribs.

Fruit bristly on the ribs.....1. *Osmorhiza nuda*

var. *divaricata*

Fruit glabrous.....2. *Osmorhiza occidentalis*

1. *Osmorhiza nuda* Torr. var. *divaricata* (Nutt.)

Jepson. Common sweet Cicely. Stem erect, branched above, 1 to 2 feet tall, glabrous or nearly so; leaves twice-ternate, the lobes ovate or lanceolate, acute or acuminate, coarsely toothed; umbels 2- to 9-rayed; fruit about 3/4 inch long, distinctly beaked, bristly-hairy on the ribs.

2. *Osmorhiza occidentalis* Torr. Western sweet Cicely. Stems branched, sometimes several, 1 to 2 feet tall; leaves twice or 3 times ternate; leaflets ovate, acute, coarsely toothed and cleft; rays 4 to 8, spreading, variable in the umbel; fruits at least 1/2 inch long, short-beaked, and glabrous.

2. *Sanicula* L.

Perennial plants with pinnately or palmately parted or divided leaves. Flowers greenish or yellow in capi-



tate or umbellate heads. Bracts of the involucre toothed and leaf-like. Fruit nearly oval, covered with hooked bristles.

1. Sanicula septentrionalis Greene. Snake-root.

Stems erect, usually branched above, slender, 6 to 12 inches tall; leaves 3-lobed, these leaflets usually again 3-lobed, the segments ovate, deeply cleft or toothed; umbels elongated with several slender rays; flowers yellow; fruits with hooked bristles.

3. Lomatium Raf.

Perennial herbs with thickened roots. Leaves once, twice or three times divided. Fruit flattened, the lateral ribs with noticeable wings.

1. Lomatium Hallii (Wats.) C. and R. Hall's hog-fennel. Plant glabrous from a more or less fleshy root; leaves once pinnate, segments deeply toothed; flowers deep yellow; fruit broadly oval, glabrous, wings almost half as wide as the body.

4. Heracleum L.

Stout-stemmed, perennial herbs with large leaves divided into three's, the petioles broad and sheathing. Flowers white in a compound many-rayed umbel. Fruit flattened, very broad, the lateral ribs with thin wings.

1. Heracleum lanatum Michx. Cow parsnip. Stem stout, 4 to 8 feet tall, hairy throughout; leaves divided into 3

leaflets, the leaflets broad, deeply toothed, 4 to 10 inches wide; flowers white, umbels 4 to 12 inches broad; fruit flattened,  $1/4$  to  $1/2$  inch long.

#### 5. *Leptotaenia* Nutt.

Large perennial herbs with thick fleshy roots. Leaves pinnately compound or divided into 3's. Fruits large, strongly flattened, the lateral ribs with broad corky wings.

1. *Leptotaenia dissecta* Nutt. Lace-leaved *Leptotaenia*. Stems stout, hollow, 1 to  $3\ 1/2$  feet tall; leaves with enlarged petioles, the blades many times divided into linear segments, minutely hairy beneath; rays of the umbel 20 to 30, these subtended by several linear bracts; petals dark purple or sometimes yellowish; fruits oblong, corky with thick wings.

#### 6. *Ligusticum* L.

Perennial glabrous herbs with aromatic roots and ternately or pinnately compound leaves. Flowers white or pinkish in large compound umbels. Involucre usually lacking. Involucels of narrow bracts. Calyx teeth minute or missing. Fruits glabrous, oblong or ovoid.

1. *Ligusticum apiifolium* (Nutt.) Gray. Celery-leaved lovage. Stems slender, 3 feet or more tall; leaves few, once or twice ternate, then pinnate; leaflets ovate, sharply linear-lobed or toothed; rays of the umbel numerous, 2 to 4 inches long; bracts of involucrel very narrow;

fruits broad-oblong, ribs prominent.

32. GARRYACEAE. Silk Tassel Family

Small evergreen tree or shrub with opposite leaves and 4-angled branchlets. Flowers very small, of two kinds on the same plant, borne in catkin-like spikes. Staminate flowers with a 4-parted calyx. Stamens 4. Styles 2. Filaments distinct. Pistillate flowers with a 2-lobed or nearly entire limb. Ovary inferior. Styles 2, persistent. Fruit berry-like.

1. *Garrya Dougl.*

Only one genus.

1. *Garrya Fremontii* Torr. Bear brush. Shrub 5 to 8 feet high; leaves 1 to 3 inches long, elliptical to obovate, glabrous and glossy above and often grayish-puberulent beneath, margins entire; catkins solitary or in clusters with sharp-pointed somewhat silky bracts; pistillate catkins around 1 1/2 inch long, the ovary and immature fruit very silky; mature fruit ovoid, purple to black, glabrous when fully developed.

33. CORNACEAE. Dogwood Family

Trees or shrubs or sometimes herbs. Leaves opposite or whorled, rarely alternate. Flowers small, in cymes or heads. Calyx minute, 4-lobed. Petals 4. Stamens 4. Ovary inferior, usually 2-celled. Fruit a drupe.

1. *Cornus* L.

Flowers small, commonly subtended by an involucre of white bracts. Calyx minute, 4-lobed.

1. *Cornus canadensis* L. Bunch-berry. Perennial herb, 4 to 8 inches tall, from a woody underground stem; leaves 4 to 6 in a whorl at the summit of the stem, sometimes a pair near the middle; flowers minute, greenish, in dense heads surrounded by broad, white, petal-like bracts; fruit globose, bright red.

## 34. ERICACEAE. Heath Family

Trees shrubs or herbs. Leaves simple, mostly alternate, often evergreen and leathery, occasionally reduced to scales. Flowers regular, white, pink or red, the parts usually in 4's or 5's. Petals usually united. Stamens free from the corolla and generally of the same number or twice as many. Anthers 2-celled and often opening by terminal pores. Ovary superior or inferior, usually 4- to 10-celled. Style 1. Stigma 1. Fruit a capsule, a berry, or sometimes a drupe.

Ovary superior

## Herbs

Plants with green leaves

Flowers in corymbs or umbels; filaments dilated at or below the middle.....1. *Chimaphila*

Flowers in racemes; filaments not dilated.....

.....2. *Pyrola*

Plants without green leaves.....

.....3. Hypopitys

Shrubs.

Flowers large, very showy.4. Rhododendron

Flowers small.

Calyx becoming enlarged and fleshy; bark not red-

ish.....5. Gaultheria

Calyx small and dry; bark red.....

.....6. Arctostaphylos

Ovary inferior.....7. Vaccinium

1. Chimaphila Pursh.

Low evergreen perennial. Leaves leathery, short-petioled, toothed. Flowers white or pink in terminal corymbs. Petals and sepals 5. Stamens 10. Style short. Stigma lobed. Ovary superior, 5-celled and 5-lobed.

Leaves wider above the middle.....

.....1. Chimaphila umbellata

Leaves wider below the middle.....

.....2. Chimaphila Menziesii

1. Chimaphila umbellata Nutt. Prince's pine. Stem usually simple, 6 to 10 inches tall; leaves leathery, short-petioled, oblanceolate to nearly elliptic, green, sharply toothed toward apex; flowers pink, 4 to 8 in a terminal corymb.

2. Chimaphila Menziesii (R. Br.) Spreng. Menzies' prince's pine. Low herbs, 4 to 6 inches tall, often branched; leaves oblong, ovate, or lanceolate, the margin sharply toothed throughout, the principal veins bordered with white; flowers 1 to 3, nodding, white or pinkish.

## 2. *Pyrola* L.

Perennial herb with slender underground stems and usually basal leaves. Flowers nodding in a raceme. Calyx 5-lobed. Petals 5. Stamens 10. Anthers opening by a terminal pore. Ovary 5-celled. Fruit a 5-celled, 5-lobed capsule.

Style straight, erect; flowers in a one-sided raceme....

.....1. *Pyrola secunda*

Style curved downward; flowers not as above

Leaves green throughout, orbicular.....

.....2. *Pyrola bracteata*

Leaves white-veined, elliptic to ovate.....

.....3. *Pyrola picta*

1. *Pyrola secunda* L. One-sided wintergreen. Stems erect or more or less ascending from a slender running rootstalk; leaves ovate or oval, thin, minutely toothed, pale green; flowers rather small, white, in a one-sided raceme; each petal with a pair of tubercles at the base; style straight.

2. Pyrola bracteata Hook. Leathery shin-leaf. Stem 10 to 14 inches tall; leaves leathery, orbicular, somewhat shiny green above, paler below, distantly minutely-toothed; flowers reddish, several to many in a raceme, each subtended by a narrow bract; calyx lobes lance-shaped, acuminate at the tips; style curved, bent downward at the base.

3. Pyrola picta Smith. White-veined shin-leaf. Stems 6 to 12 inches high; leaves ovate to elliptic, leathery, mottled or veined with white on the upper surface, margins slightly toothed or entire; flowers borne in few- to many-flowered racemes; petals usually greenish-white, sometimes pinkish or purplish with white edges; style turning downward.

### 3. Hypopitys Adans

Plant succulent, stem thickish or slender, arising from a densely matted clump of roots. Flowers several in a simple one-sided nodding raceme but becoming erect. Flower parts in 5's in the terminal flower but from 2 to 4 in the others. Sepals and petals generally of the same number. Stamens 6 to 10, the filaments pubescent. Ovary 3- to 5-celled. Stigma capitate. Fruit a 3- to 5-valved capsule.

1. Hypopitys fimbriata (Gray) Howell. Fringed pine-sap. Plant yellowish or pinkish with fleshy, pubescent

stems, 3 to 12 inches tall; leaves scale-like, ovate, finely-irregularly toothed; bracts as long as or longer than the nodding flowers which later become erect; sepals spatulate, hairy on the margins; petals narrowly obovate, hairy throughout; fruit an erect, globular capsule.

#### 4. *Rhododendron* L.

Shrubs with alternate, entire, evergreen leaves. Flowers large, showy, in terminal or lateral, umbel-like clusters. Calyx very small, 5-parted. Corolla more or less bell-shaped, usually slightly irregular. Stamens 5 or 10. Anthers opening by terminal pores. Style one, slender. Stigma shield-shaped or knob-like. Fruit a 5-celled capsule.

##### 1. *Rhododendron californicum* Hook. *Rhododendron*.

Erect shrub 8 to 12 feet high, or sometimes a tree reaching a height of 20 feet or more; leaves evergreen, oblong or elliptic, thick, leathery, pointed at both ends, dark green and smooth above, often short-pubescent or slightly rusty beneath; flowers rose-colored, or rarely white, bell-shaped, 1 1/2 to 2 1/2 inches wide, very showy; calyx small, 5-lobed; stamens 10; fruit a capsule.

#### 5. *Gaultheria* L.

Shrubs with shiny, evergreen leathery leaves. Flowers urn-shaped, white or pinkish. Calyx 5-toothed. Corolla 5-toothed. Stamens 10. Ovary superior, glabrous, 5-



toothed and 5-celled. Fruit a capsule but appearing berry-like by the fleshy calyx covering the ovary.

1. Gaultheria shallon Pursh. Salal. Shrub 1 to 5 feet tall; leaves elliptic to elliptic-oblong, finely serrate, 1 to 4 inches long; racemes axillary or terminal, pubescent with sticky hairs; corolla urn-shaped, 5-toothed, white or pinkish; fruit dark-purple or black, with a waxy bloom.

6. Arctostaphylos Adans.

Low evergreen shrubs with red-brown bark which peels leaving the branches smooth and polished. Leaves alternate, leathery, entire or with a few teeth. Flowers small, nodding, urn-shaped, in terminal racemes or clusters. Corolla pink or white with 4 to 5 recurved lobes. Calyx persistent, 4- to 5-parted, not united. Stamens 10. Anthers opening by pores, each bearing a pair of awns. Ovary superior, ovule solitary in each cell. Fruit fleshy.

1. Arctostaphylos nevadensis Gray. Pine-Mat Manzanita. Stems smooth, decumbent, forming dense low carpets; leaves thick, ovate to obovate, mucronate at the apex, glabrous or minutely puberulent, bright green on both surfaces; flowers white, few, in a raceme; berry smooth, red, globose.

7. *Vaccinium* L.

Shrubs with alternate evergreen or deciduous leaves. Flowers small, solitary or in racemes or clusters, urn-shaped to bell-shaped. Calyx persistent, united with the ovary, the lobes 4 to 5 or none. Stamens 8 to 10, anthers frequently 2-awned, opening by apical pores. Ovary inferior. Fruit a many-seeded berry.

Tall shrubs.

Leaves entire.

Berry red.....1. *Vaccinium parvifolium*

Berry blue-black.....2. *Vaccinium ovalifolium*

Leaves toothed.....3. *Vaccinium membranaceum*

Low shrubs.....4. *Vaccinium scoparium*

1. *Vaccinium parvifolium* Sm. Red huckleberry. Shrub 3 to 10 feet tall; branches slender, sharply angled; leaves oval, obtuse, entire (or serrate on young shoots), 1/2 to 1 1/2 inches long; corolla globose, white to pinkish; fruit a bright red berry, slightly acid.

2. *Vaccinium ovalifolium* Smith. Tall blue huckleberry. Shrub 5 to 9 feet tall; branches angled; leaves oval or oblong, obtuse, thin, smooth, pale beneath, with entire margins, rarely toothed near base; corolla urn-shaped, pinkish, solitary in the axils; berry blue-black with a waxy bloom.

3. *Vaccinium membranaceum* Dougl. Mountain huckleberry. Shrub 3 to 6 feet tall; leaves coarse, oval or ovate, acute,

finely toothed, 1/2 to 1 1/2 inch long, thin, glabrous; corolla nearly round, greenish to pink; berries purplish to blue-black, sometimes approaching 1/2 inch in diameter.

4. Vaccinium scoparium Leiberg. Small red huckleberry. Low brushy shrub, 6 to 18 inches tall; stems sharply angled, numerous, erect; leaves oval to ovate, very minutely toothed, bright green; corolla ovoid to globose, berries 1/8 inch in diameter, bright red, later becoming darker.

### 35. PRIMULACEAE. Primrose Family

Herbs with simple undivided leaves. Flowers regular, symmetrical, flower parts usually in fives. Sepals united at the base. Petals united 4- to 8-lobed. Stamens attached to the corolla and opposite the lobes. Pistil 1. Style 1. Ovary superior, 1-celled. Placentae free-central. Fruit a many-seeded capsule.

#### 1. Trientalis L.

Perennial herbs with simple stems and tuberous root-stalks. Leaves alternate or with a whorl of leaves at the top of the stem. Flowers on solitary pedicels arising from the leaf whorl. Corolla wheel-shaped, deeply 5- to 7-lobed. Filaments united at the base. Capsule 5-valved.

1. Trientalis europaea L. var. latifolia Torr. Star-flower. Stem slender, erect, 4 to 8 inches tall, from a white tuber; leaves 4 to 7 in a whorl near the top of the

stem, lance-shaped to oval or obovate, acute or obtuse at the apex; flowers pink, star-like.

36. GENTIANACEAE.- Gentian Family.

Glabrous herbs with opposite simple leaves and perfect regular flowers. Calyx persistent 4- to 5-lobed. Corolla 4- to 5-lobed or parted. Stamens attached to the corolla tube, alternate with the lobes and of the same number. Ovary superior, 1-celled, with 2 parietal placentae. Fruit a 2-valved capsule.

1. *Gentiana* L.

Herb with opposite, sessile, simple, entire leaves. Flowers regular, perfect. Calyx tubular, persistent, unevenly 4- to 5-toothed. Corolla 4- to 5-lobed. Stamens attached to the corolla tube, as many as the lobes and alternate with them. Ovary superior. Style short, straight. Fruit a 2-valved capsule.

1. *Gentiana calycosa* Griseb. Blue gentian. Stems simple, leafy, erect, or slightly reclining, 4 to 16 inches tall, tufted; leaves ovate to roundish, 1/4 to 3/4 inch long; flowers deep blue, greenish-dotted within, 1/2 inch or more long, the lobes acute, conspicuously toothed.

37. APOCYNACEAE. Dogbane Family

Perennial herbs with milky juice. Leaves opposite, simple. Flowers perfect, regular. Sepals united, 5-lobed,

Stamens 5, borne on the corolla and alternating with its lobes. Ovaries 2, the styles and stigmas united. Fruit maturing into follicles.

1. *Apocynum* L.

Corolla bell-shaped. Stamens borne on the corolla and alternating with 5 small appendages.

Corolla tube around 3 times the length of the calyx.....

.....1. *Apocynum androsaemifolium*

Corolla tube around twice the length of the calyx.....

.....2. *Apocynum medium*

var. *lividum*

1. *Apocynum androsaemifolium* L. Dogbane. Stems erect, branched, glabrous; leaves ovate to oblong, acute to obtuse, dark green and smooth above, pubescent beneath; flowers pink, borne in loose cymes; calyx small; corolla bell-shaped, the 5 lobes turning back, about 3 times as long as the calyx; follicles slender, pendulous, 2 1/2 to 5 1/2 inches long.

2. *Apocynum medium* Greene. var. *lividum* (Greene)

Woods. Intermediate dogbane. Stems ascending, with numerous, glabrous branches; leaves spreading, ovate to oblong, mucronate to cuneate, blades green, glabrous above, pubescent or minutely hairy beneath; flowers borne in terminal cymes; corolla pinkish or white, bell-shaped, twice as long as the calyx; the sepals ciliate, minutely and irregularly

toothed; petals somewhat spreading at the tips; follicles straight or slightly curved, pendulous, 2 1/2 to 5 1/2 inches long.

### 38. POLEMONIACEAE. Phlox Family

Annual or perennial herbs, sometimes shrubby at the base. Leaves alternate or opposite. Flower parts in 5's. Corolla regular. Sepals partly united. Petals partly united. Stamens alternate with the corolla lobes and attached to the tube. Ovary superior, 3-celled. Styles united, stigmas 3. Fruit a 3-valved capsule.

Leaves alternate, pinnately compound, leaflets entire;

corolla campanulate.....1. Polemonium

Leaves simple, often finely cut or deeply lobed, sometimes entire; corollas various.

Corolla salverform, distinctly contracted at the top of the throat.....2. Phlox

Corolla tubular, funnelform or sometimes salverform, the throat not contracted as above.....

.....3. Gilia

#### 1. Polemonium L.

Herbs with alternate, pinnately-compound leaves and entire leaflets. Flowers large, showy. Calyx tube green, short. Sepals 5. Petals 5. Stamens 5, attached to the corolla tube.

1. Polemonium carneum Gray. Vari-colored Jacob's ladder. Stems 1 to 2 feet tall, somewhat succulent, usually branched, weakly erect or ascending; entire plant smooth or minutely hairy; leaflets thin, lanceolate to ovate, acute, 1/2 to 1 1/2 inches long; flowers creamy-pink, changing to purplish-blue.

2. Phlox L.

Herbs with opposite entire leaves. Stems sometimes woody at base. Flowers borne in cymes. Calyx tube of 5 narrow sepals. Corolla showy, the lobes of the tube spreading at right angles. The capsule splitting the calyx tube at maturity.

1. Phlox Douglasii Hook. var. diffusa Gray. Mountain phlox. Stems prostrate, branching at the base to form dense mats; leaves linear, sharp-pointed, glabrous or slightly ciliate at the base; flowers 1/2 to 3/4 inch wide, bluish, pinkish or white.

Gilia R. and P.

Annual or perennial herbs. Stems sometimes woody at the base. Leaves alternate or opposite. Corolla tubular to salverform. Fruit a capsule.

Stems herbaceous.

Perennials or biennials; leaves compound, pinnately cleft

Corolla blue; inflorescence dense, head-like.....

.....1. *Gilia capitata*

Corolla scarlet, rarely pinkish or white, never blue;  
inflorescence open....2. *Gilia aggregata*

Annual; leaves simple, entire.....

.....3. *Gilia gracilis*

Stems woody at the base.....4. *Gilia Nuttallii*

1. *Gilia capitata* Dougl. Field gilly flower. Stem erect, slender, little branched, 1 to 3 feet tall, pubescent or smooth; leaves alternate, compound, pinnately divided into narrow lobes; flowers blue, in dense capitate heads; corolla small, funnelform or tubular.

2. *Gilia aggregata* (Pursh.) Spreng. Scarlet gilia. Stems erect, 1 to 2 feet tall, usually single, from a biennial taproot; plant minutely hairy, often glandular; leaves pinnately- or twice-pinnately divided into narrow segments, sparsely glandular-puberulent; basal leaves in a crowded rosette; stem leaves alternate, numerous, shorter petioled, becoming less hairy; flowers in an elongate thyrse; calyx  $1/6$  to  $1/4$  inch long, the subulate lobes 2 times as long as the tube; corolla salverform, bright scarlet, pink to salmon, or sometimes pure white; the tube funnelform,  $1/2$  to 1 inch long, 2 to 5 times as long as the calyx; stamens about equaling the lobes.

3. *Gilia gracilis* Hook. Slender gilia. Annual with slender, simple or branched stems, 2 to 8 inches tall, slightly sticky-glandular, leaves entire, opposite to



alternate, lanceolate to oblanceolate, acute; flowers solitary in the leaf axils, pink or purplish, the tube usually yellow.

4. Gilia Nuttallii Gray. Nuttall's gilia. Stems erect, 4 to 12 inches tall, tufted from a woody base; leaves opposite, sessile, palmately parted into 3 to 5 linear segments, somewhat stiff, sparingly puberulent; flowers sessile or nearly so in dense terminal clusters; corolla white with a yellow throat, salverform; tube about equal to the calyx; stamens slightly protruding from the throat of the corolla; capsule cylindrical.

### 39. HYDROPHYLLACEAE. Water-leaf Family

Herbs or shrubs with usually alternate leaves, rarely opposite. Flowers perfect, often in scorpioid cymes or solitary or capitate or in racemes. Calyx 5-lobed. Petals united at least below. Stamens five, borne on the corolla tube, alternate with its lobes. Style one, entire or 2-cleft, sometimes distinct and 2. Fruit a capsule.

Style entire.....4. *Romanzoffia*

Style 2-cleft

Flowers solitary in the leaf axils.....

.....2. *Nemophila*

Flowers in head-like or scorpioid cymes, not as above

Flowers in head-like clusters.....

.....1. *Hydrophyllum*

Flowers in scorpioid cymes.....

.....3. *Phacelia*

1. *Hydrophyllum* Tourn.

Perennial herb with alternate, mostly basal, long-petioled leaves, these pinnately parted or cleft. Flowers borne in cymose, loose or head-like clusters. Corolla bell-shaped, blue, white or purplish. Stamens exserted. Style 2-cleft.

Inflorescence more or less open; flowers generally white; leaf lobes acute at the apex.....

.....1. *Hydrophyllum* *albifrons*

Inflorescence congested into dense heads; flowers blue; leaf lobes obtuse at the apex.....

.....2. *Hydrophyllum* *occidentale*

1. *Hydrophyllum* *albifrons* Heller. White water-leaf.

Stem erect, 6 to 20 inches tall; leaves sparsely hairy, divided into 5- to 7-lobes, the teeth acute; calyx soft-hairy; flowers white.

2. *Hydrophyllum* *occidentale* Gray. Western water-leaf.

Stem erect, 8 to 16 inches tall; leaves slightly hairy, divided into 5- to 7-lobes, the teeth obtuse, the terminal lobe 3-parted; calyx stiff-hairy; flowers blue.

2. *Nemophila* Nutt.

Annual herbs with mostly opposite leaves. Flowers solitary or in racemes. Calyx 5-lobed. Stamens 5, shorter

than the corolla tube and attached to it. Style 2-cleft. Fruit a one-celled capsule.

1. Nemophila parviflora Dougl. Wood Nemophila. Stems prostrate or weakly ascending, rough with appressed hairs; leaves pinnately 5-lobed, the segments acute; flowers white.

### 3. Phacelia Juss.

Perennial herbs with alternate, pubescent leaves and showy flowers borne in scorpioid cymes. Calyx 5-lobed. Corolla white or blue or purplish. Stamens exserted, attached to the corolla. Style 2-parted.

1. Phacelia heterophylla Pursh. Vari-leaved Phacelia. Perennial, 4 to 20 inches or more tall; stems generally several, rough-hairy; basal leaves crowded in a whorl, entire, or with 1 or 2 pairs of smaller lobes at the base of the blade; herbage usually grayish with appressed rough hairs; flowers white or bluish, bell-shaped, calyx lobes obtuse, bristly-hairy on the margins; inflorescence a scorpioid cyme; stamens exserted, filaments with long soft hairs above.

### 4. Romanzoffia Cham.

Slender herbs with mostly basal kidney-shaped, long-petioled, rounded-lobed leaves. Stem leaves few, alternate. Corolla white or pinkish, funnelform, 5-lobed. Sepals 5. Stamens 5. Style slender, entire.

1. Romanzoffia sitchensis Bong. Mist maidens. Stem slender, 3 to 8 inches tall, more or less glabrous; leaves thin, kidney-shaped, 7- to 11-lobed, flowers in a loose raceme, borne on slender pedicels; corolla white, the tube yellowish; style entire.

#### 40. BORAGINACEAE. Borage Family

Herbs or shrubs, mostly rough-hairy. Leaves alternate, simple, mostly entire. Flowers perfect in one-sided scorpioid cymes. Calyx 5-lobed. Petals united. Stamens 5, borne on the corolla tube and alternating with its lobes. Ovary superior, deeply 4-lobed, breaking down into 4-one-seeded nutlets at maturity. Nutlets commonly rough-warty or prickly, sometimes smooth. Style entire, 2-cleft or none.

##### 1. Lappula Moench.

Tall herbs with entire, linear or oblong leaves. Herbage roughened, pubescent. Flowers small or medium, blue, white or pinkish, usually with appendages in the throat. Calyx 5-lobed. Nutlets armed with fine barbed prickles.

1. Lappula floribunda (Lehm.) Greene. Stickseed. Stems erect, 2 to 3 feet tall, short-hairy and somewhat roughened; stem leaves linear, oblong to oblanceolate, narrowed at the base, sessile, the basal leaves oblanceolate, on slender petioles; racemes many-flowered, narrow;

corolla blue with a yellowish throat; calyx-lobes oblong, obtuse; nutlets ovate, spines unequal.

#### 41. LABIATAE. Mint Family

Herbs or shrubs, generally fragrant, with 4-angled stems and opposite, simple leaves. Flowers irregular, perfect, more or less 2-lipped, borne in cymes or singly in the leaf axils. Calyx equally or unequally 5-lobed. Corolla tube-like, upper lobe usually 2-lipped, the lower 3-lobed. Stamens 4, attached to corolla in two pairs. Ovary superior, 4-lobed, breaking down into 4 seed-like nutlets at maturity. Style 2-lobed.

Flowers in close head-like clusters; upper pair of stamens longer than the lower..1. Agastache

Flowers in axillary, interrupted clusters; upper pair of stamens shorter than the lower.....

.....2. Stachys

##### 1. Agastache Clayt.

Tall perennial herbs. Leaves broad-ovate, petioled, toothed. Flowers purplish, crowded into a dense terminal spike. Calyx tubular bell-shaped, 5-toothed, the upper teeth slightly the longer. Upper lip of the corolla 2-lobed, slightly spreading. Stamens exserted, 4, the two pairs crossing.

##### 1. Agastache urticifolia (Benth.) Ktze. Hyssop.

Stems erect, simple or slightly branching above, 2 1/2 to

5 feet tall; leaves minutely hairy or glabrous, cordate to truncate at the base, coarsely toothed; corolla purplish to light violet, lobes often slightly hairy.

## 2. *Stachys* L.

Erect hairy herbs usually strong-scented. Flowers in axillary clusters giving a crowded spike-like appearance. Corolla 2-lipped, the upper lip erect. Stamens 4, in pairs.

1. *Stachys rigida* Nutt. Hedge-nettle. Stem 1 to 2 feet tall, coarse-hairy; leaves all petioled, the petioles shorter on the upper leaves; leaf blades 2 to 4 inches long, oblong to ovate, apex obtuse or sometimes acute, conspicuously long soft-hairy; upper leaves abruptly reduced to bracts; flowers borne in whorls, axillary in the upper bracts; corolla tube pinkish, mottled with purple; calyx bell-shaped, the teeth shorter than the corolla tube.

## 42. SCROPHULARIACEAE. Figwort Family

Herbs or shrubs with simple alternate or opposite leaves, and no stipules. Flowers perfect, usually irregular. Petals united, generally 2-lipped but sometimes almost regular. Stamens 2, 4, or 5, borne on the corolla tube, usually 4 in 2 pairs, rarely 5 or 2, the 5th stamen sometimes present as a sterile filament or gland or scale. Ovary superior, 1-celled with 2 parietal placentae or 2-celled with axial placentae. Fruit a 2-celled (or 1-celled) capsule.

Upper lip of the corolla not helmet-shaped

Corolla nearly regular; more or less unevenly rotate...

.....5. Veronica

Corolla irregular; strongly 2-lipped

Stamens 5, one sterile

Sterile filament long, about equalling the other  
stamens

Seeds wingless; anthers either glabrous or woolly..

.....2. Pentstemon

Seeds winged; anthers always woolly.....

.....3. Chelone

Sterile filaments not developed, but represented by  
a gland or scale attached to the upper side of the  
corolla.....1. Collinsia

Stamens 4, all fertile.....4. Mimulus

Upper lip of the corolla helmet-shaped

Anther cells unequal; bracts very often showy

Upper lip of the corolla much exceeding the lower;

calyx usually 2-cleft.....6. Castilleja

Upper lip of the corolla but little exceeding the

lower; calyx mostly evenly 4-lobed.....

.....7. Orthocarpus

Anther cells equal; bracts not showy.....

.....8. Pedicularis

1. Collinsia Nutt.

Annual herbs with opposite leaves and blue or white

flowers borne in a racemose or axillary whorl. Calyx 5-lobed. Corolla irregular, the upper lip 2-lobed, the lower lip 3-lobed. Fertile stamens 4 in unlike pairs, the fifth reduced to an inconspicuous gland at the base of the corolla.

1. Collinsia parviflora Dougl. Small innocence.

Stems branching, erect or spreading, 3 to 9 inches tall; leaves usually lanceolate or oblong to oblanceolate, mostly entire, sometimes toothed, nearly sessile, minutely hairy; flowers 3 to 5, in the leaf axils; corolla 2-lipped, blue, the tube white; calyx lobes acute, lanceolate, shorter than the corolla; fruit often reflexed at maturity.

2. Pentstemon Mitch.

Perennial herbs with opposite leaves, sometimes shrubby. Flowers irregular, showy, in terminal racemes, panicles or cymes. Calyx 5-parted. Corolla tube-shaped, more or less inflated, strongly or slightly 2-lipped, the upper lip 2-lobed, the lower 3-cleft. Fertile stamens 4, the 5th stamen represented by a long antherless filament, often pubescent or dilated at the tip.

Tall herbaceous plants, leaves membranous.....

- .....1. Pentstemon confertus
- var. procerus

Low half-shrubby plants, leaves leathery

Flowers purple



Leaves mostly obtuse.....2. *Pentstemon fruticosus*  
var. *Cardwellii*

Leaves oval to spatulate or roundish.....

.....3. *Pentstemon Menziesii*

Flowers crimson.....4. *Pentstemon rupicola*

1. *Pentstemon confertus* Dougl. var. *procerus* (Dougl.)

Cov. Small purple beard-tongue. Stems 1/2 to 2 feet tall, erect, glabrous; leaves entire, the basal oblong to oblanceolate, acute or obtuse, the stem leaves narrowing upwards, oblong or elliptic, rarely linear; flowers small, blue, in dense whorl-like cluster; corolla 1/2 inch or less long.

2. *Pentstemon fruticosus* (Pursh.) Greene. var.

*Cardwellii* (How.) Pip. Cardwell's beard-tongue. Stems ascending from a loosely clustered, woody rootstalk; leaves obtuse, very thick, leathery, always toothed; inflorescence a few-flowered raceme; corolla tubular, bright purple, 1 to 1 1/2 inch long; sterile stamen but little shorter than the fertile, sparingly bearded.

3. *Pentstemon Menziesii* Hook. Menzies' beard-tongue.

Plant prostrate from a much branched woody stem which forms dense mats; leaves oblong to ovate, minutely toothed; flowers blue-purple, 1 to 1 1/4 inch long, borne in a raceme.

4. *Pentstemon rupicola* (Pip.) How. Crimson beard-

tongue. Stems woody, much branched, forming dense mats;

leaves very glaucous, finely toothed, ovate to roundish, 1/4 to 1/2 inch long; corolla showy, 1 to 1 1/2 inch long, crimson to rose-colored.

### 3. *Chelone* L.

Perennial herbs with opposite leaves and sharply toothed margins. Flowers large, showy. Anthers woolly. Antherless stamen shorter than the fertile. Seeds broadly winged.

1. *Chelone numorosa* Dougl. Turtle-head. Stems erect, simple, 1 to 3 feet tall, leafy, leaves 1 1/2 to 2 inches long, ovate, narrowing upwards, petioled, obtuse at base, acute or acuminate at apex, flowers in open, few-to-many flowered panicles; calyx teeth lanceolate; corolla pink to violet, 1 inch long, throat very broad, upper lip short, 2-cleft, the lower lip 3-cleft, exceeding the upper lip.

### 4. *Mimulus* L.

Annual or perennial herbs with opposite leaves. Calyx 5-angled, 5-toothed. Corolla irregular, 2-lipped, upper lip spreading. Stamens 4. Stigma 2-lobed. Flowers yellow.

Stem weak, leaves slimy-glandular.....

.....1. *Mimulus moschatus*

Stem erect, leaves not as above.....

.....2. *Mimulus Tilingii*

Flowers rose or reddish.....3. *Mimulus Breweri*

1. Mimulus moschatus Dougl. Musk. Plant slimy; stems weak, spreading or erect; leaves ovate to oblong, toothed, short-petioled or sessile; flowers  $3/4$  to 1 inch long; corolla pale yellow, spotted in the throat; lobes nearly equal.

2. Mimulus Tilingii Regel. Stem erect from a conspicuous rootstalk; leaves ovate or roundish, irregularly toothed, the upper sessile; pedicels longer than the corolla; flowers few or one, deep yellow, often red-spotted in the throat.

3. Mimulus Breweri (Greene.) Rydb. Brewer's Monkey-flower. Annual, sticky hairy; stem slender, 1 to 4 inches tall, simple or branched; leaves linear-lanceolate, short-petioled or sessile, entire; flowers rose or pink, axillary, small,  $1/4$  inch or less long.

#### 5. Veronica L.

Herbs or shrubs with chiefly opposite leaves. Flowers small. Corolla 4-parted, wheel-shaped, somewhat irregular. Stamens 2. Capsule flattened, usually notched at apex.

Racemes all axillary.....1. Veronica americana

Raceme one, terminal.....2. Veronica serpyllifolia

1. Veronica americana Schwein. Common speedwell. Stems branching, glabrous, erect or decumbent, rooting at the base,  $1/2$  to 2 feet high; leaves glabrous, ovate or

oblong, short-petioled, serrate, acute at apex; racemes in upper leaf axils; flowers blue with light center and conspicuous dark veins.

2. Veronica serpyllifolia L. Thyme-leaf speedwell. Stems decumbent, slender, simple or branched, 2 to 10 inches high, leaves sessile or short-petioled, ovate to oblong, entire or slightly toothed; flowers small; corolla blue to whitish with darker veins.

#### 6. Castilleja Mutis.

Perennial or annual herbs, sometimes woody below. Leaves alternate, sessile, entire or lobed. Flowers in terminal racemes or spikes subtended by green or brightly colored bracts or leaves. Calyx tubular, 4-lobed. Corolla tube strongly 2-lipped, upper lip longer than the lower and enclosing the style and 4 unequal stamens, lower lip short, 3-lobed or toothed.

Leaves entire; glabrous...1. Castilleja miniata

Leaves cleft into linear lobes; somewhat hairy.....

.....2. Castilleja angustifolia

1. Castilleja miniata Dougl. Stems erect, glabrous; leaves lanceolate or linear-lanceolate, entire; spikes dense, short; bracts red-tipped, showy, 3 to 5-toothed, shorter than the flowers; upper corolla lip long; lower lip very short.

2. Castilleja angustifolia G. Don. Indian paintbrush. Stems mostly simple, erect, 6 to 14 inches tall, more or

less hairy throughout; upper bracts sticky-hairy; leaves cleft to below the middle into 3 to 5 linear lobes; bracts often 3-cleft, the central lobe broad and sometimes 3-cleft; corolla scarlet.

#### 7. *Orthocarpus* Nutt.

Annual or perennials. Leaves sessile, mostly alternate, entire, deeply cleft or incised. Flowers frequently bright-colored, borne in spikes or racemes. Calyx 4-cleft, tubular. Upper lip of corolla narrower and scarcely longer than the 3-saccate lower lobe. Stamens 4.

1. *Orthocarpus imbricatus* Torr. Mountain owls-clover. Stems slender, erect, slightly hairy throughout, 1/2 to 1 1/2 feet tall, leaves linear-lanceolate; bracts broad, partly purple, closely overlapping; corolla purplish, short and compact; lower lip nearly as long as the upper lip.

#### 8. *Pedicularis* L.

Perennial herbs. Leaves toothed or lobed, alternate, opposite or whorled. Flowers in terminal racemes or bracted spikes. Calyx 2- to 5-toothed or lobed. Corolla strongly 2-lipped, upper lip often arched, sometimes beaked, the lower 3-lobed. Stamens 4, enclosed by the upper lip.

Leaves lanceolate, doubly toothed.....

.....1. *Pedicularis racemosa*

Leaves pinnately divided.....2. *Pedicularis bracteosa*

1. *Pedicularis racemosa* Dougl. Mountain figwort.  
Stems usually many, slender, somewhat spreading; plant glabrous; leaves lanceolate, doubly toothed; flowers in loose terminal racemes; bracts leafy; corolla pink or white, the upper lip strongly incurved and prolonged downward into a hooked beak.

2. *Pedicularis bracteosa* Benth. Indian warrior.  
Stems usually simple, stout, erect, 1 to 3 feet tall; leaves thin, ovate to oval in outline, the basal petioled, the stem leaves divided into narrow segments, these sharply incised or toothed; flowers in an erect, dense spike; corolla whitish; upper lip curved downward, hooded at the apex.

#### 43. OROBANCHACEAE. Broom-rape Family

Root-parasites without green color, leaves reduced to alternate scales. Flowers complete. Calyx 4- to 5-lobed, persistent. Corolla tubular, more or less 2-lipped. Stamens 4, borne on the corolla tube. Ovary superior, 1-celled. Fruit a many-seeded capsule.

##### 1. *Orobanche* L.

Low purplish or yellowish parasites. Calyx 5-parted, the lobes acute or acuminate. Corolla tubular, curved; upper lip 2-lobed to entire, erect or arched, the lower

3-lobed and spreading. Stamens 4, borne on the corolla tube, included. Fruit dry.

1. Orobanche fasciculata Nutt. Naked broom-rape.

Stem scaly, emerging mostly from the ground, bearing many fascicled peduncles, 4 to 8 inches tall; calyx lobes broadly awl-shaped, usually shorter than but often exceeding the corolla tube; flowers usually yellow, sometimes purple tipped.

44. PLANTAGINACEAE. Plantain Family.

Annual or perennial herbs with all basal leaves. Flowers small, regular. Sepals 4. Petals 4. Stamens 4 or rarely 2. Ovary 2- to 4-celled, superior.

1. Plantago L.

Leaves nerved or ribbed. Flowers small, in bracted spikes or heads. Sepals 4, persistent. Corolla tube-like, the lobes spreading. Stamens exerted. Ovary 2-celled or falsely 4-celled. Capsule 2- to several-seeded.

1. Plantago lanceolata L. English plantain. Perennial with erect stem, 15 to 25 inches tall; leaves all basal, short-hairy, long lanceolate, strongly 3- to 5-ribbed; spike dense, thicker near the base, 3/4 to 2 inches long; stamens twice as long as the corolla.

45. RUBIACEAE. Madder Family

Herbs or shrubs with opposite or whorled, usually stipulate leaves. Flower parts in 4's or 5's. Stamens 4 or 5, borne on the corolla tube. Ovary inferior, usually

2-celled.

1. *Galium* L.

Annual or perennial herbs with 4-angled stems and apparently whorled leaves. Flowers small, in cymes or panicles, rarely in pairs. Calyx lobes minute or none. Corolla 4-parted, rarely 3-parted. Stamens 4 or 3. Styles 2. Ovary 2-lobed, 2-celled. Fruit glabrous or bristly, separating when ripe into 2 seed-like carpels, only one often maturing.

Leaves 6 to 8 in a whorl

Leaves linear-spatulate; flowers white.....

.....1. *Galium aparine*

Leaves elliptic-lanceolate; flowers greenish white....

.....2. *Galium triflorum*

Leaves 4 in a whorl.....3. *Galium kamtschaticum*

var. *oreganum*

1. *Galium aparine* L. Annual bed-straw. Stems weak, spreading, 1 to 3 feet long, roughly short-hairy on the angles; leaves 6 to 8 in a whorl, linear or linear-spatulate; flowers white, borne on long stalks; fruits covered with short, hooked bristles.

2. *Galium triflorum* Michx. Fragrant bed-straw. Stems slender, erect or trailing, smooth or rough-hairy on the angles, 1/2 to 2 feet long; leaves elliptic or oblanceolate, usually in whorls of 6; flowers usually 3, or more,



sometimes less, greenish white; fruits covered with hooked bristles.

3. Galium kamschaticum Steller. var. oreganum.

(Britt.) Piper. Northern wild licorice. Stems slender, numerous, 1/2 to 1 1/2 feet tall; leaves in whorls of 4, broadly oblong-ovate, distinctly 3-nerved, sparsely hairy on the margins and veins; flowers in cymes, cream-colored, distinctly pediceled; fruits sparsely to densely covered with hooked bristles.

46. CAPRIFOLIACEAE. Honeysuckle Family

Shrubs or trees, rarely herbs. Leaves opposite. Calyx 3- to 5-toothed or wanting. Corolla regular or sometimes irregular, 4 to 5-lobed. Stamens 4 to 5. Fruit a drupe, capsule or berry.

Leaves simple

Flowers tubular or funnelform

Shrubs, erect or climbing

Flowers irregular; fruit a red or black berry.....

.....1. Lonicera

Flowers regular; fruit a white berry.....

.....2. Symphoricarpus

Vine, prostrate or creeping; flowers in pairs.....

.....3. Linnaea

Flowers spreading wheel-shaped.....

.....4. Viburnum

Leaves compound.....5. Sambucus

1. *Lonicera* L.

Erect or climbing shrubs with opposite simple leaves, one or two pairs united around the stem beneath the flowers. Flowers in axillary pairs or in small clusters.

Calyx teeth 5 or missing entirely. Corolla more or less irregular, 5-lobed, commonly 2-lipped, sometimes swollen at one side of the base. Ovary 2- to 3-celled, becoming a berry in fruit.

Climbing shrubs; flowers orange-red.....

.....1. *Lonicera ciliosa*

Erect shrubs; flowers white...2. *Lonicera utahensis*

1. *Lonicera ciliosa* Poir. Climbing honeysuckle.

Stems twining or trailing, 6 to 12 feet tall; leaves oval, obtuse, hairy on the margins, glaucous beneath, uppermost pairs united into saucer-shaped disks; flowers orange-red borne in a compact, dense cluster.

2. *Lonicera utahensis* Wats. Utah honeysuckle. Erect, branching shrub; leaves ovate to elliptic, obtuse at the apex, slightly pubescent on the under surface; flowers white, borne in a pair at the tip of the peduncle; fruits slightly united, red, divergent.

2. *Symphoricarpos* L.

Erect to nearly prostrate shrubs with simple, opposite leaves. Flowers in small axillary or terminal racemes. Calyx tube 4 to 5-lobed. Corolla tube pink or

or white, 4- to 5-lobed, bell-shaped. Stamens 4 to 5, attached to the corolla tube. Fruit a white berry.

1. Symphoricarpos albus (L.) Blake. Snowberry.

Erect shrub, 3 to 10 feet tall; leaves round-oval to oblong, glabrous, entire to wavy-margined or lobed; corolla pink, 5-lobed, inflated at the lower side, very woolly within; fruit a globose berry, sometimes distorted in a crowded cluster.

2. Symphoricarpos mollis Nutt. Mountain snow-berry.

Low trailing or spreading shrub; leaves pubescent, oval to oblong, usually entire, occasionally lobed or toothed on younger shoots; corolla pinkish to white, only slightly hairy within; fruit a white berry.

3. Linnaea L.

Slender trailing evergreen plant. Stems somewhat woody at base. Leaves opposite. Flowers in pairs on erect stalks. Corolla bell-shaped. Stamens 4. Ovary 3-celled. Fruit a 1-seeded capsule.

1. Linnaea borealis L. var. americana Rehder. Twin-flower. Stem trailing, slender, forming mats; leaves oval or obovate, evergreen, opposite, leathery; flowers in pairs; pink or white; ovary inferior, densely hairy.

4. Viburnum L.

Shrubs or small trees with simple, entire or toothed or lobed leaves. Corolla regular, spreading, wheel-shaped.

Flowers cream-colored, borne jointed to the pedicels, in a compound cyme. Calyx 5-lobed. Stamens 5. Fruit a drupe.

1. Viburnum ellipticum Hook. Western wayfaring tree. Shrub, 5 to 10 feet tall; leaves minutely pubescent, 1 to 3 inches long, orbicular or elliptic, 3- to 5-nerved from the base; cymes 1 to 2 inches wide; fruit oval, nearly 1/2 inch long, black, one side 2-grooved, the other side 3-grooved.

#### 5. Sambucus L.

Small trees or shrubs. Leaves opposite, compound. Flowers small, cream-colored, borne in a showy, terminal cyme. Calyx minutely 5-toothed. Corolla wheel-shaped, regular, 5-lobed. Ovary 3- to 5-celled. Fruit berry-like with 3 to 5 one-seeded nutlets.

Inflorescence flat-topped; fruit blue.....

.....1. Sambucus glauca

Inflorescence pyramid-shaped; fruit red.....

.....2. Sambucus racemosa

var. callicarpa

1. Sambucus glauca Nutt. Blue elderberry. Shrub 5 to 20 feet high; leaflets 5 to 9, serrate, 1 1/2 to 5 inches long, pointed at apex; inflorescence flat-topped; flowers small, cream-colored or whitish; fruits dark blue with a dense white bloom giving them a very pale appearance.

2. Sambucus racemosa L. var. callicarpa Jepson. Red elderberry. Shrub or a small tree, 3 to 12 feet high; leaflets 5 to 7, ovate or elliptic, all sharply serrate, 1 to 4 inches long, abruptly acuminate at apex, more or less pubescent beneath; inflorescence pyramidal, 3 to 5 inches tall; flowers minute, cream-colored; fruit red to scarlet.

#### 47. VALERIANACEAE. Valerian Family

Herbs with opposite leaves. Flowers borne in cymes. Corolla united, tubular or funnel-form. Calyx attached to the ovary, 5-lobed. Stamens 1 to 3. Ovary inferior, 3-celled. Fruit one-seeded, dry.

##### 1. Valeriana L.

Perennial herbs with mostly basal leaves. Calyx lobes of 5 to 15 plume-like bristles. Corolla tubular or funnellform, commonly enlarged or somewhat swollen at the base, 5-lobed, nearly regular. Stamens 3.

1. Valeriana sitchensis Bong. Mountain valerian. Stems 1 1/2 to 3 feet tall, erect, glabrous except at the nodes; basal leaves simple or compound with a few leaflets, blades ovate or elliptic; stem leaves somewhat narrower and more strongly toothed; flowers white or pinkish, borne in a close terminal cluster.

## 48. CUCURBITACEAE. Gourd Family

Mostly climbing or trailing, tendril-bearing herbs. Stems fleshy or succulent. Leaves alternate, simple, palmately lobed or veined. Stamens and pistils on different flowers. Corolla 4- to 7-lobed, attached to the calyx. Calyx fused with the ovary in pistillate flowers. Ovary inferior, 1 to 6-celled. Stamens usually 3.

1. *Echinocystis* T. and G.

Herbs with trailing stems and large alternate leaves. Staminate flowers in racemes or panicles, the pistillate solitary from the leaf axils. Fruit globose, prickly, gourd-like at first, becoming at length dry.

1. *Echinocystis oreganus* Cogn. Wild cucumber. Stems trailing or climbing, 4 to 20 feet long, slender or roughened; leaves 5 to 9-lobed, rough hairy above, 2 to 4 inches wide; flowers small, whitish; fruit somewhat prickly at the base, 2 to 3 inches long, becoming dry at maturity.

## 49. CAMPANULACEAE. Bell-flower Family

Herbs with milky juice. Leaves alternate, simple. Calyx persistent, 5-lobed. Corolla bell-shaped. Stamens 5, alternate with corolla lobes. Ovary inferior. Style 1. Stigmas 2 to 5. Fruit a capsule.

1. *Campanula* L.

Small herbs with alternate leaves and bell-shaped, blue flowers. Sepals 5, narrow. Capsule opening by holes

at the sides near the top.

Flowers dark blue; leaves nearly sessile.....

.....1. *Campanula prenanthoides*

Flowers pale blue; leaves petioled.....

.....2. *Campanula Scouleri*

1. *Campanula prenanthoides* Dur. Slender blue-bell.

Stem slender, 1 to 2 feet tall; leaves ovate to lanceolate, toothed, sessile or nearly so; flowers clustered, borne in a loose panicle or raceme, dark blue.

2. *Campanula Scouleri* Hook. Pale blue-bell. Stem 6 to 12 inches tall; leaves ovate to lanceolate, toothed, petioles at least half as long as the blade or longer; flowers borne in a loose raceme, panicle or sometimes solitary, pale blue or almost white.

#### 50. COMPOSITAE. Sunflower Family

Herbs or shrubs. Leaves various, without stipules. Flowers small, in close heads, on a common receptacle surrounded by an involucre of bracts. Calyx absent or modified into a pappus of bristles, scales, teeth, awns, etc. Corolla tubular in disk flowers or strap-shaped in ray flowers, both usually 5-lobed. Stamens 5, their anthers united into a tube around the style. Ovary inferior. Fruit an achene.

Flowers all strap-shaped; juice milky

Heads solitary; leaves all basal...1. Agoseris

Heads several; leaves present on the stem.....

.....2. Hieracium

Flowers composed of both tubular and strap-shaped flowers,  
or all tubular

Pappus of hairs or bristles

Flowers with strap-shaped corollas present.

Leaves mostly opposite.....11. Arnica

Leaves alternate

Ray flowers yellow

Involucre bracts usually narrow in an even  
series of one or two rows.....

.....13. Senecio

Involucre bracts in several series, usually  
overlapping.....12. Aplopappus

Ray flowers purple, bluish, pinkish or white (ours)

Involucre bracts narrow, usually in an even  
series, sometimes two; rays narrow, numerous..

.....4. Erigeron

Involucre bracts in several series, broader,  
generally overlapping the rays; fewer than  
above.....3. Aster

Flowers all tubular, all alike

Flowers white or whitish



Leaves prickly.....14. *Cirsium*

Leaves not prickly

Pappus bristles of the staminate flowers club-  
shaped.....5. *Antennaria*

Pappus bristles all alike, not as above.....  
.....6. *Anaphalis*

Flowers bright yellow

Leaves opposite.....11. *Arnica*

Leaves alternate

Plants large, rank; few-flowered.....  
.....10. *Rainiera*

Plants smaller; flowers numerous.....  
.....13. *Senecio*

Pappus none

Flowers white

Ray flowers none.....7. *Adenocaulon*

Ray flowers present.....8. *Achillea*

Flowers yellowish or greenish.....  
.....9. *Artemisia*

1. *Agoseris* Raf.

Annual or perennial herb, with milky juice and basal leaves. Heads borne solitary on leafless hollow stems. Flowers strap-shaped, yellow or rarely orange or purplish, the bracts imbricated in several series, the outer shorter

and broader. Achenes oblong or linear, 10-ribbed, the apex forming a beak. Pappus of numerous soft, white, bristles.

Flowers orange; leaves entire or slightly toothed.....

.....1. *Agoseris aurantiaca*

Flowers yellow; leaves sharply toothed or deeply cleft..

.....2. *Agoseris laciniata*

1. *Agoseris aurantiaca* (Hook.) Greene. Burnt-orange dandelion. Stems 10 to 15 inches tall; leaves oblanceolate, entire or usually so; flowers orange, fading to purple; beak usually shorter than the body of the achene.

2. *Agoseris laciniata* (Nutt.) Greene. Tall false dandelion. Stems 8 to 24 inches tall; leaves sharply toothed or deeply cleft into linear lobes; flowers showy, pale yellow; beak of the mature achene longer than the body; pappus almost equalling the beak.

## 2. *Hieracium* L.

Perennial herb with milky juice. Leaves alternate, mostly entire, often basal. Heads borne in panicles of white or yellow, all strap-shaped flowers. Bracts in 1 to three series, the shorter at the base. Achenes narrowly cylindrical. Pappus of 1 or 2 rows of rough, tawny bristles.

Flowers white.....1. *Hieracium albiflorum*

Flowers yellow.....2. *Hieracium cynoglossoides*  
var. *nudicaule*

1. Hieracium albiflorum Hook. White-flowered hawkweed. Stems simple, erect, 1 to 3 feet tall; plant smooth or nearly so above, long hairy below; flowers white.

2. Hieracium cynoglossoides Arv. var. nudicaule Gray. Naked-stemmed hawkweed. Stems one to several, 6 to 10 inches tall, naked; leaves all basal; flowers bright yellow, exceeding the involucre.

### 3. Aster L.

Perennial herbs, rarely shrubs with alternate, simple, entire or toothed leaves and showy flowers. Heads usually numerous, in panicles, racemes or corymbs, rarely solitary. Ray flowers in one row, purple, blue or white, never yellow. Disk flowers yellow. Involucral bracts in 3 to 5 rows, leaf-like or leathery, often passing into the upper leaves. Achenes flattened. Pappus of numerous, unequal, whitish, hair-like bracts.

Stems very leafy to the top; leaves thin, cottony pubescent beneath, margins entire or nearly so.....

.....1. Aster ledophyllus

Stems not so leafy; leaves leathery, harsh pubescent or rough-hairy, margins sharply toothed.....

.....2. Aster radulinus

1. Aster ledophyllus Gray. Cascade Aster. Stems erect, very leafy to the top, 1 to 2 feet tall; leaves many, entire or nearly so, smooth above, cottony pubescent beneath; bracts of the involucre often purple tipped; heads

several; rays 5 to 20, purple; disk flowers yellow; pappus brownish; achenes sparsely hairy.

2. Aster radulinus Gray. Rough-leaved Aster. Stems erect, 1 to 1 1/2 feet tall; leaves firm, leathery, harsh pubescent or rough hairy, obovate to oblanceolate, margins sharply toothed; heads borne in a terminal cyme; bracts of the involucre greenish tipped; rays 12 to 25; disk flowers often reddish; achenes slightly hairy.

#### 4. Erigeron L.

Herbs with alternate, simple leaves. Involucre bracts in one or sometimes two series, nearly equal in length. Pappus of scanty, hairlike bristles. Flowers of two types, both commonly present. Ray flowers, when present, usually very numerous, narrow, white, blue, purple, pink or yellow. Disk flowers yellow. Achenes flattened, usually minutely soft-hairy.

Leaves relatively large, usually broadly lance-shaped or spatulate

Involucre shaggy-hairy.....1. Erigeron Coulteri

Involucre glandular-pubescent, not as above.....

.....2. Erigeron salsuginosus

Leaves relatively small, usually numerous and narrow.....

.....3. Erigeron foliosus

1. Erigeron Coulteri Porter. Coulter's Daisy. Stems slender, solitary, erect, 1 to 2 feet tall; leaves sparsely

pubescent, slightly serrulate, narrowly obovate to oblanceolate, reduced to a winged base below, 2 to 6 inches long; heads usually solitary, involucral bracts equal, longer than the disk; rays 50 to 80, narrowly linear, white.

2. Erigeron salsuginosus (Richards.) Gray. Mountain daisy. Stems 1/2 to 2 feet tall; lower leaves oblanceolate, toothed; stem leaves lance-shaped, oval or ovate, sessile; heads solitary, 1 1/4 to 1 3/4 inches broad; involucral bracts spreading, linear, minutely glandular hairy; ray flowers 50 to 70, pink or purplish.

3. Erigeron foliosus Nutt. Leafy daisy. Stems many from the base, simple below, erect, 1 to 2 feet tall; leaves narrowly linear or lanceolate, crowded on the stem; heads roundish, borne in an open terminal raceme; involucre bracts narrowly lanceolate, unequal, glandular-puberulent or pubescent; ray flowers 30 to 40, broad, bright blue.

#### 5. Antennaria Gaertn.

Matted, more or less woolly herbs with alternate leaves and small flower heads. Involucral bracts papery, in several series, the outer shorter, usually woolly. Pappus of staminate flowers thickened at the apex, those of the pistillate flowers united at the base in a ring.

1. Antennaria lanata (Hook.) Greene. Silky everlasting. Stems simple, slender, erect, 3 to 7 inches tall,

tufted; lower leaves oblanceolate, loosely white woolly; upper leaves linear to lanceolate, becoming increasingly smaller above; heads in a dense compact cluster; involucre densely woolly at the base, outer involucre bracts dark brown, inner white and papery.

#### 6. *Anaphalis* DC.

Perennial, white woolly herbs with erect, leafy stems and alternate, entire leaves. Flower heads many, small, white, dioecious, with a few perfect flowers in the center of the pistillate heads. Involucre bracts white, papery. Pappus bristles falling off separately, those of the staminate flowers little if at all thickened at the apex.

1. *Anaphalis margaritacea* (L.) B. and H. var. subalpina Gray. Alpine pearly everlasting. Stems slender, several from the base, 6 to 12 inches high, white woolly; leaves narrow, 2 to 4 inches long, woolly on both surfaces, acuminate and clasping, with a revolute margin; inflorescence compact.

#### 7. *Adenocaulon* Hook.

Perennial herbs with alternate petioled leaves, mostly basal, green above, white-woolly beneath. Heads small, 5- to 10-flowered, borne in panicles. Involucre bracts thin, few, in one series. Flowers all tube-shaped. Achene elongated, club-shaped. Pappus none.

1. Adenocaulon bicolor Hook. Pathfinder. Stems erect, slender, 1/2 to 3 feet tall, more or less woolly-pubescent; leaves broad, triangular-ovate, green and smooth above, white and woolly beneath, base heart-shaped, margins angularly-toothed; branches of the panicle glandular.

### 8. Achillea L.

Strongly-scented perennial herbs with alternate, serrate or pinnately-dissected leaves. Heads small, borne in many-flowered corymbs. Ray flowers white, rarely pink, 4 to 12. Disk flowers yellowish, few, 5-lobed. Involucral bracts in 3 or 4 series. Pappus none.

1. Achillea millefolium L. var. lanulosa Piper  
Western Yarrow. Stems erect, 12 to 24 inches tall; herbage grayish, densely white-hairy; leaves pinnately divided into very fine, numerous, narrow segments; upper leaves much reduced upwards; inflorescence small, often distinctly congested.

### 9. Artemisia L.

Aromatic, strongly-scented, bitter herbs or shrubs with alternate leaves and numerous small discoid heads, borne in a paniced spike or raceme. Ray-flowers none. Disk flowers yellowish to greenish, the outer pistillate and the inner perfect, or all perfect.

1. Artemisia vulgaris L. var. ludoviciana Jepson.  
Common wormwood. Stems 2 to 3 feet tall; leaves densely

white on both faces, the upper lanceolate, entire, the lower usually 3-cleft at the apex; the involucre white-woolly; spikes in a narrow compact panicle; flowers 15 to 25.

#### 10. *Rainiera*

Perennial herb with alternate, sessile, entire leaves and numerous rayless heads in an elongate panicle. Flowers yellow, 4 to 8 in each head, all tubular, deeply 5-cleft. Achenes smooth. Pappus of numerous, pale-tawny bristles.

1. *Rainiera stricta* Greene. *Rainiera*. Stems stout, erect, 1 1/2 to 2 1/2 feet tall, nearly glabrous; leaves oblong-lanceolate, entire, or rarely obscurely toothed; upper leaves sessile or nearly so, reduced upwards; flowers pale yellow; heads 4 to 6 flowered; pappus pale brown.

#### 11. *Arnica* L.

Erect perennial herbs with mostly opposite, entire or serrate leaves. Heads rather large consisting of both ray and disk flowers. Ray flowers yellow, pistillate, fertile, the corolla entire or toothed. Disk flowers yellow, perfect, fertile, 5-lobed. Achenes narrow, 5- to 10-ribbed. Pappus a single series of rough barbellate brownish or white bristles.

Basal leaves cordate; long petioled.....

.....1. *Arnica latifolia*

Basal leaves not cordate; short petioled.....

.....2. *Arnica amplexicaulis*



1. Arnica latifolia Bong. Broad-leaved arnica.

Stems erect from long, slender rootstalks, glabrous or sparingly pubescent; leaves all opposite, in pairs; the lower leaves petioled, cordate, or sub-cordate, coarsely and irregularly dentate; stem leaves 2 or 3 pairs, oval to ovate, the uppermost sessile, rounded to acute at the apex; heads several, long peduncled, about 1 1/2 inches wide; involucral bracts generally short hairy, acute or acuminate. Achenes glabrous.

2. Arnica amplexicaulis Nutt. Clasping arnica. Stems

erect, tufted at the base, 1 to 2 feet tall, nearly glabrous; leaves 3 to 5 pairs, ovate to acute, all gummy above; the upper leaves sessile, the basal petioled; heads 3 to 5, long peduncled, 1 1/2 inches wide; achenes hairy.

12. Aplopappus Cass.

Herbs or low shrubs with alternate leaves. Heads solitary or clustered. Involucral bracts numerous, overlapping. Ray flowers yellow, if present. Achenes angled, top-shaped, more or less linear. Pappus of tawny or reddish hairlike bristles.

1. Aplopappus Hallii Gray. Hall's aplopappus. Stem erect, 8 to 16 inches tall, shrubby below, minutely rough-hairy or almost smooth, branched, the branches angled; leaves rough-hairy, oblanceolate, entire, mostly sessile,

numerous, reduced upwards; heads solitary or few, many-flowered; involucral bracts top-shaped, lanceolate, acute, green-tipped, margins papery; achenes silky-hairy; pappus cream to yellowish.

### 13. Senecio L.

Herbs or shrubs with alternate leaves. Heads solitary or in cymose clusters. Involucral bracts in one series or rarely a few smaller outer bracts. Achenes 5- to 10-ribbed, cylindrical. Pappus of many soft white bristles.

Stem leaves pinnately divided or compound.....

.....1. *Senecio Harfordii*

Stem leaves not as above, often toothed.

Stems leafy throughout.....2. *Senecio triangularis*

Stems few-leaved or naked above.....

.....3. *Senecio integerrimus*

1. *Senecio Harfordii* Greene. Harford's senecio. Stem erect, 1 to 2 feet tall, almost glabrous; leaves thin, pinnately divided into irregularly lobed divisions, the lower leaves often simple, roundish in outline, lobed or crenate; inflorescence a terminal cyme, few to several headed, heads less than 1/2 inch high; involucral bracts shorter than the disk flowers.

2. *Senecio triangularis* Hook. Spear-head senecio. Stem slender, erect, 1 to 4 feet tall; leaves triangular, oblong-ovate, toothed, the blades 3 to 4 inches long,

truncate at the base; heads in corymbs or cymes; involu-  
cral bracts slender, acute, generally black-tipped with  
minute hairs present.

3. Senecio integerrimus Nutt. Tall western senecio.  
Stem erect, simple, 1 to 3 feet tall, somewhat hairy at  
first; leaves mostly basal, these petioled, minutely  
toothed to entire, oblanceolate; upper leaves small,  
sessile, linear, reduced above to bracts; involu-  
cral bracts conspicuously black-tipped; rays yellow.

14. Cirsium Scop.

Biennial or perennial herbs with alternate, dentate  
or pinnately lobed or cleft, prickly leaves. Heads large,  
terminal, usually showy, red, yellow, or white. Flowers  
all tubular. Involucral bracts often spine-tipped, imbric-  
ated in many series. Receptacle bristly or hairy.  
Achenes flattened, glabrous. Pappus of numerous bristles  
united at the base in a ring, all falling at the same time.

1. Cirsium americanum (Gray.) Robs. Slender mountain  
thistle. Stems erect, 1 to 3 feet tall, sparingly branched  
above; leaves white-woolly beneath, narrowly lanceolate,  
coarsely dentate to pinnately cleft, weakly prickly; heads  
mostly solitary, terminating the branches; involu-  
cral bracts fringed; flowers cream-colored.

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## GLOSSARY

- Achene, a small dry one-seeded, indehiscent fruit.
- Acuminate, gradually tapering to a point.
- Acute, sharp pointed.
- Aggregate fruit, collection of separate but closely associated carpels from one flower.
- Alternate, leaves when only one from a node; stamens are alternate with petals when they are located over the intervals between them.
- Annual, completes the life cycle in one year.
- Anther, the pollen bearing part of the stamen.
- Apex, the free end or tip.
- Apical, pertaining to the apex.
- Appendage, any special outgrowth or structure.
- Appressed, lying flat and close against another organ.
- Aquatic, living in the water.
- Ascending, growing upward.
- Attenuate, long and slender pointed.
- Auriculate, ear-like.
- Awn, a bristle.
- Axial placenta, with seeds borne on the axis.
- Axillary, borne in an axil.
- Axis, a central support.
- Banner, the upper petal of a pea-like flower.
- Barbellate, Minutely barbed.

Basal, situated at the base.

Basifixed, attached at the base.

Beaked, tipped with a point.

Bearded, having a beard.

Berry, a fleshy fruit formed from a single superior or inferior ovary.

Biennial, completes the life cycle within two years.

Bipinnate, twice pinnate.

Blade, the flat expanded part of a leaf or petal.

Bloom, a fine white powdery or dusty coating.

Bract, a modified reduced leaf.

Bractlet, a small modified leaf subtending a flower or inserted on the pedicel.

Bulb, a cluster of mostly underground storage leaves set closely on a short stem.

Bulblet, a small bulb, often borne on the stem or among the flowers.

Bur, a fruit covered with prominent spines.

Callous, hardened.

Callus, hardened and often smooth tissue or protuberances; in grasses the tough swelling below the base of the lemma or palea.

Calyx, the outer usually green whorl of the flower.

Campanulate, bell-shaped.

Capitate, collected into a head or head-like.

**Capsule**, a dry, dehiscent fruit composed of more than one  
carpel.

**Carpel**, a simple pistil or one of the divisions of a com-  
pound pistil.

**Catkin**, a scaly spike of imperfect flowers as in the wil-  
low or oak.

**Cell**, cavity of an ovary or carpel.

**Chaffy**, scale-like.

**Ciliate**, margin fringed with hairs.

**Ciliolate**, minutely ciliate.

**Claw**, the narrow or petiole-like base of a petal.

**Cleft**, with sharp lobes usually cut to about the middle.

**Column**, an organ formed by the united stamens and styles,  
in the Orchid family.

**Complete**, a flower which has sepals, petals, stamens and  
pistils present.

**Compound**, of two or more similar parts united into a whole.

**Cone**, the seed-bearing structure of most Gymnosperms.

**Conical**, cone-shaped.

**Conifer**, a cone-bearing Gymnosperm.

**Coniferous**, cone-bearing.

**Contiguous**, adjacent to each other.

**Contracted**, narrowed or shortened, spreading but slightly.

**Cordate**, heart-shaped.

**Coriaceous**, leathery.



**Corm**, a very short, thickened underground stem, sometimes called a solid bulb.

**Corolla**, the petals of a flower.

**Corymb**, a flat topped flower cluster in which the outer flowers bloom first.

**Corymbose**, arranged in corymbs.

**Cotyledon**, first leaves of the embryo plant already formed in the seed.

**Crenate**, with rounded or blunt teeth.

**Crown**, a modified stem-base from which the stems and roots are produced.

**Cuneate**, wedge-shaped.

**Cyme**, a flattish flower cluster in which the central flowers bloom the earliest.

**Cymose**, consisting of cymes.

**Deciduous**, falling after maturity.

**Decumbent**, lying on the ground but tending to rise at the summit.

**Dehiscent**, opening for the discharge of seeds, splitting.

**Dentate**, with sharp teeth pointing directly outward.

**Diffuse**, much branched and spreading.

**Dilated**, broadened.

**Dioecious**, having stamens and pistils produced on different individual plants.

**Discoid**, disk-like, disk-flowers only.

- Disk, an expansion of the receptacle below the ovary.
- Disk flower, a tube-shaped flower in the Composite family.
- Dissected, deeply cut into numerous small segments.
- Distinct, completely separate.
- Divergent, spreading away from each other.
- Dorsal, relating to the back, the part turned away from the axis.
- Drupe, a fleshy or pulpy fruit with the inner portion of the mature ovary hard or stony.
- Druplet, a small drupe forming a part of the aggregate fruit, as in a blackberry.
- Elliptic, oblong with regularly rounded ends.
- Embryo, the rudimentary plant in the early stage of development.
- Entire, not toothed or indented on the margins.
- Erode, as though bitten or gnawed.
- Evergreen, green the entire year.
- Exserted, protruding.
- Fascicle, a close cluster.
- Fertile, capable of producing fruit.
- Fibrous, consisting of fibers.
- Filament, stalk-like part of the stamen bearing the anther.
- Filiform, thread-like.
- Fimbriate, fringed.
- Floret, a small flower, usually of a cluster in grasses.

Flexuous, bent alternately in opposite directions, zigzag.

Foliaceous, leaf-like.

Foliage, green leaves of a plant.

Foliate, having leaflets 3-foliate, having three leaflets.

Follicle, a dry, dehiscent fruit derived from a single  
carpel.

Forked, divided into two equal branches.

Free, not attached to other structures.

Frond, leaf of a fern.

Fruit, a ripened ovary with all its parts.

Funnelform, widened upward like a funnel.

Glabrous, not hairy.

Gland, a secreting structure on the surface, usually ending in a hair or any protuberance of like nature which may not secrete.

Glandular, possessing glands, usually sticky.

Glaucous, whitened with a fine powdery substance.

Globose, rounded more or less spherical.

Glume, one of the two lowest bracts on a spikelet in  
grasses.

Grain, a one-seeded indehiscent seed-like fruit; a caryopsis.

Hastate, arrow-shaped with the basal lobes turning outward.

Head, a dense cluster of flowers, sessile on the summit of  
the stem.

- Herb, a plant without a woody stem above the ground.
- Herbaceous, like an herb, without woody parts.
- Hooded, curved or arching in the form of a hood.
- Hypogynous, parts borne on the receptacle below the ovary.
- Imbricated, overlapping.
- Imperfect, lacking in either stamens or pistils.
- Incised, sharply and deeply toothed.
- Included, not projecting, the opposite of exerted.
- Incomplete, lacking in some essential part.
- Indehiscent, not opening at maturity.
- Indusium, the reflexed or turned back margin of the leaf covering the sporangia in the ferns.
- Inferior, when flower parts are attached below the ovary.
- Inflated, bladder-like, swollen.
- Inflorescence, the arrangement of flowers on the plant.
- Inserted, borne upon.
- Interrupted, not continuous.
- Involucel, a secondary or partial involucre.
- Involucre, a circle of bracts subtending a flower cluster.
- Irregular, the parts not of the same size and shape.
- Keel, a longitudinal ridge, the 2 lower flowers of a pea-like flower are joined into a keel.
- Keeled, having a keel.
- Lanate, covered with soft, woolly hairs.
- Lanceolate, lance-shaped.

Lateral, on the sides.

Lax, loose.

Leaflet, one of the divisions of a compound leaf.

Legume, a dry dehiscent fruit formed from a single carpel, having two lines of dehiscence.

Lemma, the lowest bract of a floret in grasses.

Lenticel, raised light spot on a stem used as a "breathing pore".

Linear, narrow with parallel sides.

Lip, one of the two divisions of a 2-lipped corolla.

Lobe, a division of an organ.

Lobed, cut into shallow divisions.

Locule, one of the cavities in an ovary.

Lyrate, having the terminal segments much larger than the others.

Membranous, thin and transparent.

Midrib, middle or main vein of a leaf.

Monecious, with stamens and pistils in separate flowers on the same plant.

Mottled, spotted.

Mucronate, tipped with a sharp but rather soft point.

Nerve, usually an unbranched rib.

Node, joints of a stem.

Nut, an indehiscent fruit with a hard, firm wall resulting from a compound ovary.

Nutlet, a tiny nut.

Ob, inverted.

Obcordate, inverted heart-shaped, notch at the apex.

Oblanceolate, inversely lanceolate.

Oblique, sides unsymmetrical or unequal.

Oblong, two or three times longer than broad with the sides tapering to each end from the middle.

Obovate, widest near the apex narrowing abruptly to the base.

Obsolete, not evident.

Obtuse, blunt or rounded.

Offset, a branch at the surface of the ground that takes root.

Opposite, leaves two at a node.

Orbicular, circular in form.

Oval, elliptic with a contraction upward.

Ovary, the ovule bearing part of the pistil.

Ovate, egg-shaped, broadest near base.

Ovoid, egg-shaped.

Ovule, an undeveloped seed.

Palea, the smaller of the two scales or bracts that enclose the flower in grasses.

Palmate, spreading from the petioles like the fingers from the palm.

Panicle, a loose branching raceme or corymb.

Papillose, having nipple-like protuberances.

Pappus, bristles, hairs, plumes, scales, etc. borne on the fruit of the sunflower family.

Parasite, growing upon or deriving food from another living plant.

Parietal, located on the wall or side.

Pedately, palmately.

Peduncle, a stalk or stem of a flower cluster.

Peltate, round, with the stalk attached on the under surface near the middle.

Pendent, hanging.

Pendulous, hanging.

Perennial, living for a number of years.

Perfect, having both stamens and pistils in the same flower.

Perianth, the calyx and corolla taken together.

Persistent, remaining after flowering.

Petal, a unit of the corolla.

Petiole, the stalk of a leaf.

Pinna, one of the primary divisions of a fern frond, or of a compound leaf.

Pinnate, arranged along the sides of a common petiole.

Pinnately compound, having the leaflets along the axis or midrib.

Pinnule, one of the segments of a pinna.

Pistil, the female organ of the flower.

Pistillate, bearing pistils but no stamens.

Placenta, that part of the ovary to which the seeds are attached.

Plaited, plicate, folded lengthwise.

Plumose, feathery.

Pod, a dry fruit which generally splits at maturity.

Pollen, the powdery material borne on the anther of the stamen.

Pome, an inferior fleshy fruit with more than one carpel.

Prickle, a rigid spine-like outgrowth.

Procumbent, trailing or on the ground.

Prostrate, lying flat on the ground.

Puberulent, covered with very fine short hairs, minutely pubescent.

Pubescent, Hairy.

Pyramidal, Pyramid-like.

Raceme, a flower cluster in which the flowers are borne along the peduncle on pedicels of nearly equal length.

Racemose, borne in racemes or raceme-like.

Rachilla, the axis of a spikelet in the grass family.

Ray, a flattened corolla borne on the margin of the head in many composites.

Ray flowers, those flowers in the sunflower family having strap-shaped corollas.



Receptacle, that part of the stem to which the flower parts are attached.

Reflexed, turning backward.

Regular, said of a flower when the parts have the same size and shape.

Reniform, kidney-shaped.

Revolute, rolled backward or under.

Rootstalk, a rhizome.

Rosette, a circular, often basal cluster of leaves.

Rotate, wheel-shaped.

Runner, a basal branch that roots at the end forming a new plant.

Saccate, sac-shaped.

Saggitate, arrowhead-shaped.

Salverform, narrowly tubular, with limb spreading abruptly.

Samara, an indehiscent winged fruit.

Saprophyte, a plant that lives on dead or decaying organic matter.

Scale, a thin, flat leaf-like structure.

Scaly, having scales.

Scarious, thin and dry, often papery.

Scorpid, appearing coiled inward.

Seed, an embryo plant with its protective covering.

Segment, one of a series of a division of a leaf, corolla calyx, etc.

Sepal, a unit of the calyx.

Serrate, toothed, these turning upward.

Serrulate, finely serrate.

Sessile, no stalk present.

Shaggy, covered with long white hairs.

Sheath, the basal part of a leaf which encloses a section  
of the stem.

Shrubby, shrub-like.

Silicle, a capsule not much longer than wide.

Silique, a capsule several times longer than wide.

Silky, with long appressed hairs.

Simple, unbranched; leaf composed of one piece; pistil  
composed of one cell.

Slimy, covered with slime.

Smooth, without roughness on the surface.

Solitary, only one.

Sorus, a cluster of sporangia.

Spatulate, wide at the apex, narrowed below.

Spike, a dense raceme.

Spikelet, a small spike-like flower cluster in the grass  
family.

Spiny, having spines.

Sporangium, the case in which spores are borne.

Spore, a one-celled, non-sexual reproductive body.

Spreading, widely divergent.

Spur, a hollow projection.

Stalk, stem.

Stamen, one of the male organs of a flower.

Staminate, having stamens but no pistils.

Sterile, not capable of reproduction.

Stigma, the terminal part of the pistil, which receives  
the pollen.

Stipulate, bearing stipules.

Stipules, small appendages borne in pairs at the base of  
the petiole.

Stolon, a runner or basal, usually prostrate, branch  
which roots at the nodes.

Stomata, small openings for the admission of air into  
leaves and stems.

Style, the narrow portion of the pistil which bears the  
stigma.

Subcordate, slightly cordate.

Subtended by, bearing at the base or below.

Subulate, awl-shaped.

Sub-globose, slightly or nearly spherical.

Succulent, juicy or fleshy.

Superior, used when the parts of the flower are borne  
below the ovary.

Suture, the line of splitting or dehiscence.

Symmetrical, said of a flower having the same number of  
parts in each whorl.

Taproot, a stout tapering central root.

Tawny, a dull yellowish-brown.

Tendrill, a slender stem or modified leaf that coils about  
or clings to a support.

Terete, round.

Terminal, at the end.

Ternately compound, several times compound the divisions  
in threes.

Thallus, a non-differentiated plant body.

Throat, the dilated upper portion of the corolla tube.

Thyrse, a close or contracted ovate cluster.

Tomentose, covered with matted woolly hairs.

Toothed, having teeth.

Triternately compound, three times divided into threes.

Truncate, square cut.

Tube, the narrow part of a united corolla or calyx.

Tuber, a fleshy, more or less rounded underground stem, as  
the potato.

Tubercle, a wart-like projection.

Tuberous, bearing tubers, tuber-like.

Tubular, shaped like a tube.

Tufted, closely clustered.

Umbel, a flower cluster having nearly equal branches  
arising from the same place.

Umbellate, having umbels.

Undulate, somewhat wavy margined.

Utricle, a one-seeded inflated fruit.

Vascular bundles, the strands of conducting tissues which carry materials and foods.

Vein, a rib in a leaf.

Versatile, attached in the center and both ends swinging free.

Villous, shaggy with long rather soft, not woolly hairs.

Viscid, sticky.

Warty, covered with warts.

Waxy, covered with a bloom or coating which has the appearance of wax.

Whorl, the organs borne in a circle.

Whorled, borne in a whorl.

Wing, a thin flat extension.

Winged, with wings.

Wiry, having the appearance of wire.

Woody, approaching the nature of wood.

Woolly, with wool-like hairs.

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