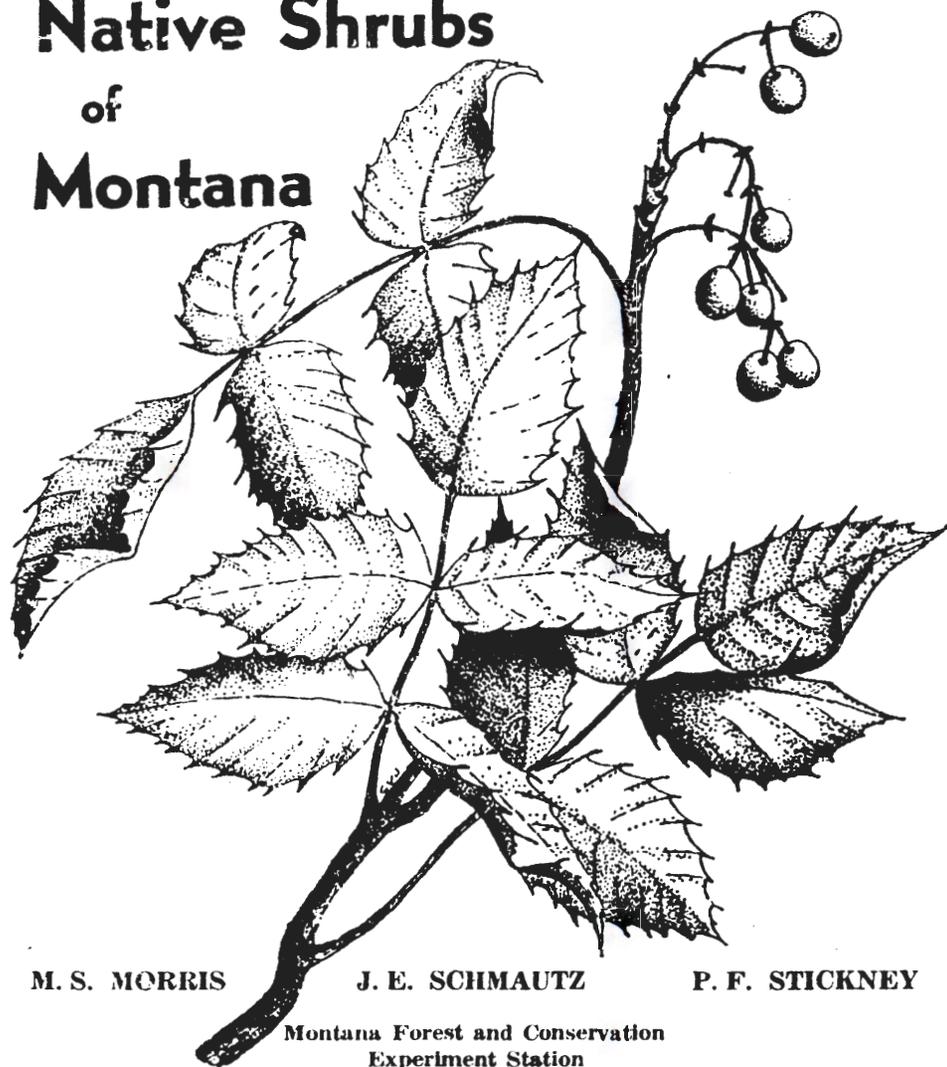


Winter Field Key to the Native Shrubs of Montana

BULLETIN NO. 23
DECEMBER, 1962



M. S. MORRIS

J. E. SCHMAUTZ

P. F. STICKNEY

Montana Forest and Conservation
Experiment Station
Montana State University
and

Intermountain Forest and Range Experiment Station
Forest Service
U. S. Department of Agriculture

Winter Field Key to the Native Shrubs of Montana

MELVIN S. MORRIS

Professor of Range Management
Montana State University

JACK E. SCHMAUTZ

Range Conservationist
Northern Region, U. S. Forest Service

PETER F. STICKNEY

Range Conservationist (Research)
Intermountain Forest and Range Experiment Station
U. S. Forest Service

Illustrated by C. V. Janda

MONTANA FOREST AND CONSERVATION EXPERIMENT STATION
Montana State University

and

INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION
Forest Service
U. S. Department of Agriculture

1962

Taxonomic Changes as of January 2015

Acer glabrum – Rocky Mountain maple

var. *douglasii*: deeply lobed to divided leaves and red twigs.

var. *glabrum*: shallowly lobed leaves and gray twigs.

** Varieties intergrade ecologically and geographically.

Alnus incana – thin-leaved alder

Alnus tenuifolia: old name

In Montana our plants are subspecies *tenuifolia*.

Alnus viridis – green or Sitka alder

Alnus sinuata, *Alnus crispa*: old names

In Montana our plants are subspecies *sinuata*.

Atriplex gardneri – Gardner's saltbush

Atriplex nuttallii: old (misapplied) name

Berberis repens – Oregon grape

Mahonia repens: old name

Betula occidentalis – water or black birch

Betula fontinalis: old name

Ericameria nauseosa – goldenbush, rabbitbrush

Chrysothamnus nauseosus: old name

Cornus sericea – red-osier dogwood

Cornus stolonifera: old name

Crataegus chrysocarpa – hawthorn

Crataegus columbiana: old (misapplied) name

Dasiphora fruticosa – shrubby cinquefoil or potentilla

Potentilla fruticosa, *Pentaphylloides fruticosa*, and

P. floribunda: old names.

Oplopanax horridus – Devil's club

Echinopanax horridum: old name

Shepherdia argentea – silver buffaloberry

Elaeagnus utilis: old name

Krascheninnikovia lanata – winterfat

Eurotia lanata: old name

Linanthus pungens – granite prickly phlox

Gilia pungens: old name

Paxistima myrsinites

Pachistima or *Pachystima myrsinites*: old name

Populus acuminata is actually thought to be a hybrid

between *P. deltoides* and *P. angustifolia*

Populus balsamifera – black or balsam cottonwood

Populus trichocarpa: old name

Rhus aromatica – skunkbush sumac

Rhus trilobata: old name

Toxicodendron rydbergii – poison ivy

Rhus radicans, *R. toxicodendron*: old name

Contents

INTRODUCTION	1
ECOLOGY OF SHRUB DISTRIBUTION	2
KEYS TO GENERA AND SPECIES	6
Populus	16
Ribes	16
Rosa	17
Symphoricarpos	17
Vaccinium	17
DESCRIPTIONS AND ILLUSTRATIONS	18
REFERENCES	64
GLOSSARY	65
INDEX	69

Introduction

Native shrubs provide the bulk of the food for Montana big-game herds, and the degree of use and vigor of key shrubs often provide major criteria for annual range and wildlife management recommendations. As a result, many fieldworkers are required to recognize these plants in winter condition. Proper identification, however, has been a persistent problem because no adequate guide to Montana shrubs has been available. This publication is designed to supply the need for an effective field guide to the native shrubs of Montana in winter condition.

The following suggestions are made to assist in using the Key and to assure correct determination of species:

1. Examine several plants of the species in question.
2. Look for old fruit or flower stalks, thorns, or armed branchlets.
3. Select branches from several plants.
4. Avoid using severely hedged branches, twigs, or suckers as the only diagnostic material. Since most of the critical characters are on twigs of the previous season's growth, it is essential that the samples have a fair amount of such growth.

This key is designed for field use. No character too small to be observed with a 10X lens has been considered diagnostic. Technical terminology has been simplified wherever possible, and all botanical terms used are defined in the Glossary (pp. 65-67); most of them are illustrated in Figures 1 and 2.

Plant descriptions and illustrations follow the Key (pp. 18-63) and are arranged alphabetically by genera. Line drawings illustrate important or "key" characteristics but do not attempt to characterize any plant completely. Species descriptions summarize known range and habitat in Montana, winter characteristics, and forage values for both livestock and wildlife.

The following shrubs, known or reported to be in Montana, were not included in this key because of insufficient information about them, rarity of occurrence, questionable growth form, or because they were unknown to the authors: *Amorpha canescens*, *Chimaphila menziesii*, *Eriogonum heracleoides*, *Gaultheria ovatifolia*, *Grayia spinosa*, *Kelseya uniflora*, *Luetkea pectinata*, *Petrophytum caespitosum*, *Ribes hendersonii*, *Rubus leucodermis*, *Solanum dulcamara*, *Spiraea densiflora* (*S. splendens*), *Tetradymia spinosa*, and *Viburnum opulus*.

The four most important of these are: *Eriogonum heracleoides*, a half-shrub found in sagebrush or grassland in western Montana. Leaves are narrowly elliptical and evergreen. *Grayia spinosa*, an upright shrub on dry sites in southwestern Montana. Without true buds, has armed branchlets; older bark stripped. An excellent forage species. *Rubus leucodermis*, a sprawling shrub along roadsides and draws in northwestern Montana. Armed with straight or recurved, heavy-based, flattened spines; stems whitish. *Tetradymia spinosa*, a rigidly branched medium shrub in dry foothills and plains of southwestern Montana; rare. Twigs densely white—woolly and armed with spreading, somewhat recurved, spines.

The authors acknowledge extensive use of several publications in

preparing this key. Technical nomenclature follows that in *Vascular Plants of the Pacific Northwest*, Parts III, IV, and V (Hitchcock *et al.*, 1955, 1959, and 1961). Common plant names represent a compromise among several sources, including *Standardized Plant Names* (Kelsey and Dayton, 1942). *Flora of Montana*, Part II, Dicotyledons (Booth and Wright, 1959) furnished additional information about shrub distribution; and *Flora of Alberta* (Moss, 1959) was helpful in separating some difficult species. Other major reference sources were: *Key to Important Woody Plants of Eastern Oregon and Washington* (Hayes and Garrison, 1960); *Winter Guide to Native Shrubs of the Central Rocky Mountains* (McKean, 1956); and *Northern Rocky Mountain Trees and Shrubs* (Kirkwood, 1930).

The authors are indebted to Dr. L. Jack Lyon for critical review and counsel in the preparation of the manuscript.

Ecology of Shrub Distribution

An understanding of the ecology of shrub distribution is useful in identifying many species. Some separations in this key are, in fact, based on the premise that ecological requirements confine certain plants to limited or distinctive habitats. The following definitions of zones and communities have been used in making such separations.

Alpine-Subalpine Zone.—This zone is characterized by high elevations, a short growing season, and wind. It includes alpine, alpine transition (timberline), and upper subalpine (meadow or forest) vegetation. Shrubs are usually low or prostrate and spreading forms. On upland, well-drained sites, red and yellow mountain heaths, white mountain heather, and alpine willows are common. *Dryas* forms mats on dry or cold, gravelly sites. Subalpine meadows and poorly drained areas are sites for swamp laurel, alpine wintergreen, velvetleaf huckleberry, willows, and bog birch, while in open subalpine forests, alder is a common shrub.

Spruce-Fir (Lodgepole Pine) Forest Zone.—High precipitation and acid soils characterize this zone. Shrubs are mainly subdominants. Common species under a virtually continuous forest canopy are grouse whortleberry, myrtle whortleberry, willow, ground juniper, some currants, and rusty menziesia. Along the edges of forest openings, swamp laurel, white rhododendron, wintergreen, and alder are conspicuous; and in snowslide areas, alder and alderleaf buckthorn are common. This zone is often called the subalpine zone.

Cedar-Hemlock (White Pine) Forest Zone.—This zone is characterized by high precipitation. Typical shrubs, mainly climax subdominants, are: yew, thinleaf huckleberry, devils club, twinflower, pachistima, currants, cascara, and Douglas spiraea. A transitional type in which many shrubs are conspicuous, develops following fire and logging. This type characteristically includes willow, mountain maple, bitter cherry, oceanspray, redstem ceanothus, evergreen ceanothus, and serviceberry.

Douglas-fir (Western Larch) Forest Zone.—Forests in this zone do not have shrubs that are true dominants except along lake or stream

margins. Willow, mountain maple, huckleberry, spiraea, ninebark, oceanspray, and snowberry are the more common species. Aspen thickets may occur in pockets that have soils of nearly neutral pH. Utah honeysuckle may be locally abundant. When fire or logging, particularly fire, removes the coniferous overstory, shrubs develop temporary dominance. With repeated burning, shrubs may form semipermanent communities.

Ponderosa Pine Forest Zone.—This forest may contain Rocky Mountain juniper as a codominant on extremely dry sites. Serviceberry and chokecherry, together with snowberry, creeping hollygrape, and kinnikinnick, are the more typical shrubs. Oceanspray, mockorange, and maple form rockslide communities. Evergreen ceanothus is common in the upper elevations of the pine type and in adjacent Douglas-fir stands. Fire in this zone encourages development of extensive stands of ceanothus. The ponderosa pine and Douglas-fir forest zones are sometimes collectively referred to as the montane forest zone.

Sagebrush-Bunchgrass (Foothill-Mountain Valley) Zone.—The transition from forest to grassland is rarely abrupt. Generally, with lower elevation and decreasing precipitation, Douglas-fir and pine are replaced by Rocky Mountain juniper and bitterbrush or sagebrush in pure stands or mixtures. On still drier sites, the forest is replaced by bunchgrass and mixed prairie dominants. In the bunchgrass zone, plowing, heavy grazing, or other disturbance may temporarily provide favorable conditions for invasion of the grassland by sagebrush, snake-weed, or rabbitbrush.

Streambank Communities.—Of the shrub communities extending downward from the subalpine forest to the grasslands, streambanks are perhaps the only ones that exhibit dominance or permanence. Thinleaf alder, willow, water birch, or redosier dogwood are common at many elevations. *Ribes hudsonianum*, bearberry honeysuckle, black elderberry, and alderleaf buckthorn are associated with up-stream sites; while paper birch and black cottonwood are more frequent at intermediate elevations. Approaching grassland elevations, the common shrubs are willow, serviceberry, chokecherry, hawthorn, snowberry, and rose, with occasional plants of blue elderberry.

Alkali Shrub Communities.—On certain sites, vegetative growth may be limited by soil salinity or alkalinity. The complex distributions of greasewood in the alkali swales of the Missouri and Yellowstone drainages are of this nature. Shadscale and greasewood are associated with the saline scablands of eastern Montana, and winterfat and salt sage are also found on alkaline soils. Buffaloberry is usually associated with saline lowlands of eastern Montana.

Great Plains and Other Communities.—East of the mountains, the most common shrubs are big sagebrush, snakeweed, and fringed sagebrush. Pingüe occurs as scattered individuals. Where more soil moisture is available, the draws and coulees of eastern Montana contain thickets of snowberry, rose, hawthorn, wild plum, chokecherry, serviceberry, various species of *Ribes*, green ash, boxelder, and buffaloberry. Many other shrubs occupy small ecological niches that do not reflect significant habitats. Sumac, poison ivy, horizontal juniper, silveberry, skunkbrush, wild raspberry, and others are probably of this nature.

While these shrubs, except sagebrush, do not compose very extensive plant communities, they are sufficiently abundant and widely distributed to be significant among the flora of the State.

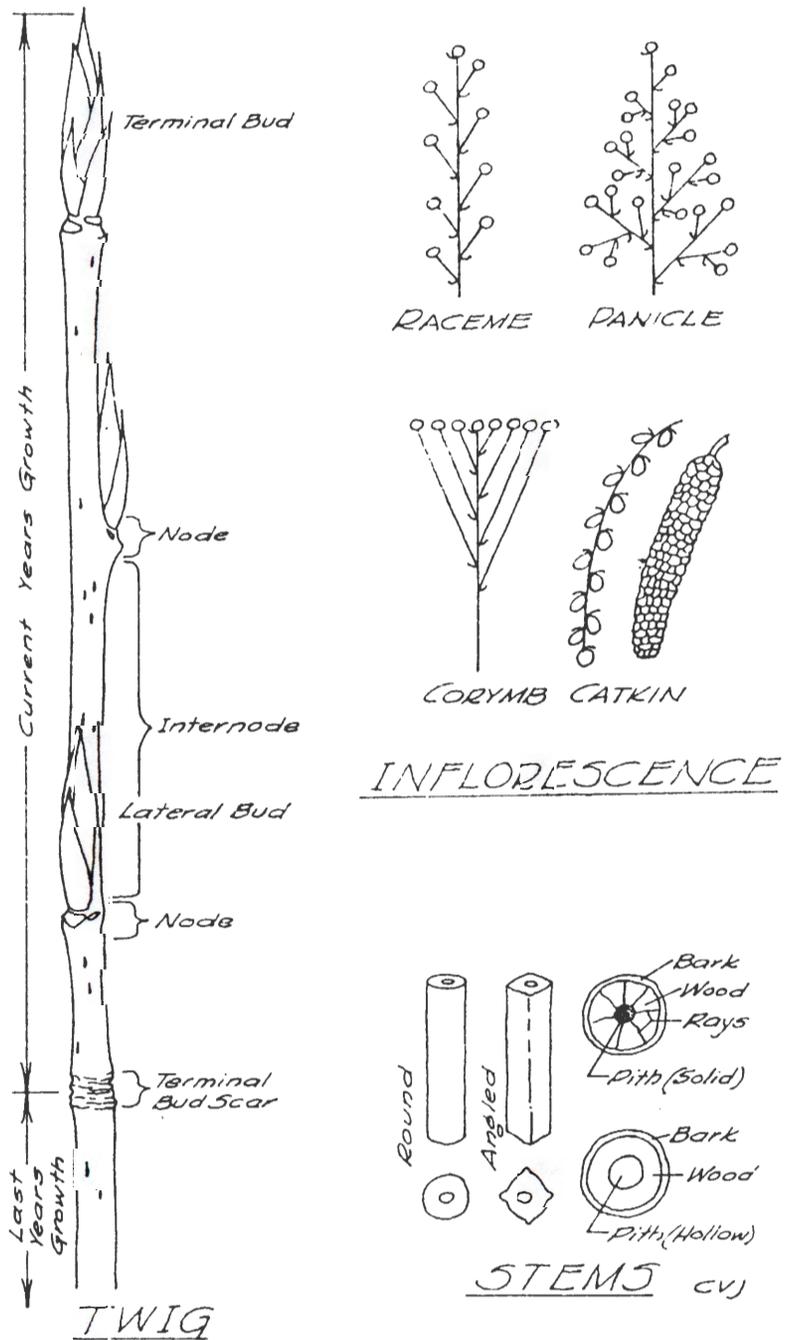


FIGURE 1. Illustrations of plant characteristics used in the key.

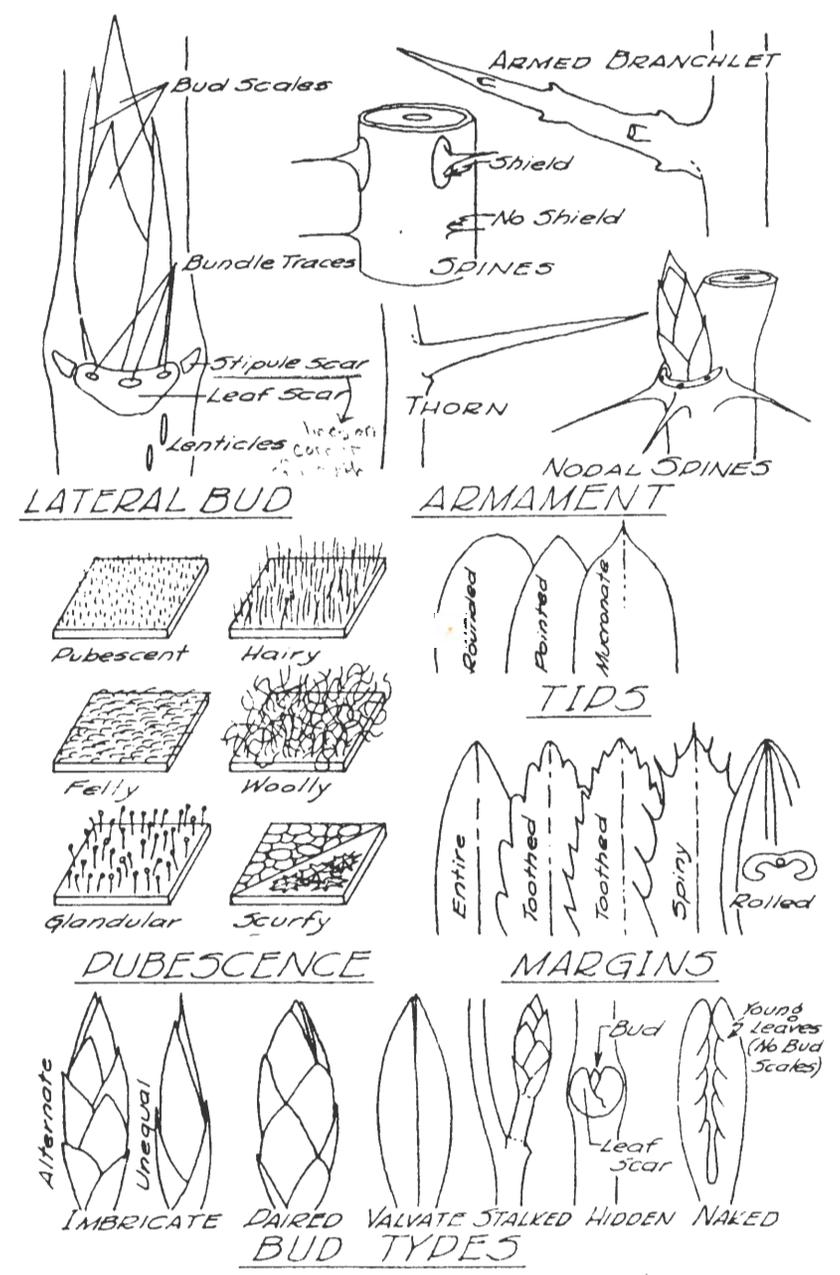


FIGURE 2. Illustrations of plant characteristics used in the key.

Keys to Genera and Species

- 1 Vines
- 2 Buds alternate
 - 3 Tendrils with adhesive disks PARTHENOCISSUS QUINQUEFOLIA
 - 3 Tendrils without adhesive disks VITIS RIPARIA
 - 2 Buds opposite
 - 4 Stems round, pith hollow LONICERA CILIOSA
 - 4 Stems angular, pith solid
 - 5 Leaflet stalks 5-7; tall climbers; fences and bottomlands CLEMATIS LIGUSTICIFOLIA
 - 5 Leaflet stalks 3; low climbers; pine and fir forests CLEMATIS COLUMBIANA
- 1 Not vines
- 6 Leaves evergreen or persistent (alternate p. 10)
 - 7 Leaves persistent (not evergreen), spiny and divided LEPTODACTYLON PUNGENS
 - 7 Leaves evergreen
 - 8 Upper leaf surface scurfy or with appressed hairs (alternate p. 8)
 - 9 Leaves with scurfy covering
 - 10 Shrubs 2-4 feet high; branches armed ATRIPLEX CANESCENS
 - 10 Shrubs seldom over 2 feet high
 - 11 Woody throughout, spiny ATRIPLEX CONFERTIFOLIA
 - 11 Woody only at base, not spiny ATRIPLEX NUTTALLII
 - 9 Leaves with appressed hairs
 - 12 Non-aromatic
 - 13 Leaf 3-tipped, tomentose below only PURSHIA TRIDENTATA
 - 13 Leaf not 3-tipped, felty tomentose above and below EUROTIA LANATA
-
- 12 Aromatic (sage odor)
 - 14 Leaf strap-shaped, tip entire ARTEMISIA CANA
 - 14 Leaf various, notched at tip or divided
 - 15 Armed with spinelike branches ARTEMISIA SPINESCENS
 - 15 Not armed with spines
 - 16 Leaf 5 to many lobes or segments; half-shrubs
 - 17 Leaf segments filiform, silvery throughout ARTEMISIA FRIGIDA
 - 17 Leaf segments not filiform, thin
 - 18 Green above with scattered hairs, tomentose below ARTEMISIA MICHAUXIANA
 - 18 Tomentose throughout ARTEMISIA SCOPULORUM
 - 16 Leaf 3-lobed; shrubs
 - 19 Old seedstalk a panicle
 - 20 Notches on leaf tip shallow ARTEMISIA TRIDENTATA
 - 20 Notches on leaf tip deep ARTEMISIA TRIPARTITA
 - 19 Old seedstalk a raceme or simple panicle
 - 21 Leaf dark yellow-green, old seedstalk brown ARTEMISIA ARBUSCULA var. NOVA
 - 21 Leaf gray, old seedstalk grayish ARTEMISIA ARBUSCULA

- 8 Upper leaf surface glabrous or with thin bloom
- 22 Leaf scale-, awl-, needle-, or swordlike
- 23 Leaves scalelike and imbricate
- 24 Treelike with one or more stems JUNIPERUS SCOPULORUM
- 24 Prostrate shrubs
- 25 Foothills and plains JUNIPERUS HORIZONTALIS
- 25 Alpine
- 26 Leaf strongly grooved; rare CASSIOPE TETRAGONA
- 26 Leaf not grooved CASSIOPE MERTENSIANA
- 23 Leaves narrow, several times longer than wide
- 27 Leaf awl-shaped or spiny, white line on one surface JUNIPERUS COMMUNIS
- 27 Leaf not awllike
- 28 Leaves all basal, swordlike; foothills and plains YUCCA GLAUCA
- 28 Leaves arranged along the stem, needlelike; mountains
- 29 Leaf with mucronate tip; tall shrubs or treelike TAXUS BREVIFOLIA
- 29 Leaf without mucronate tip; small shrubs; alpine
- 30 Upper leaf surface with medial furrow,
lower surface without white line PHYLLODOCE EMPETRIFORMIS
- 30 Upper left surface without medial furrow,
lower surface with white line PHYLLODOCE GLANDULIFLORA
- 22 Leaves not as above, if narrow then lance-like and margins rolled
- 31 Older stems prostrate
- 32 Leaf margin spiny MAHONIA REPENS
- 32 Leaf margin not spiny

- 33 Leaves thin
- 34 Leaves alternate GAULTHERIA HUMIFUSA
- 34 Leaves opposite LINNAEA BOREALIS
- 33 Leaves thick
- 35 Leaf margins entire ARCTOSTAPHYLOS UVA-URSI
- 35 Leaf margins toothed
- 36 Leaf elliptic, base wedge-shaped DRYAS DRUMMONDII
- 36 Leaf lance-shaped, base rounded (heart-shaped) DRYAS OCTOPETALA
- 31 Older stems erect
- 37 Leaf margin not entire
- 38 Leaves alternate; lower surface with 3 prominent veins CEANOTHUS VELUTINUS
- 38 Leaves opposite or whorled; lower surface with 1 prominent vein
- 39 Leaves opposite; shrub PACHISTIMA MYRSINITES
- 39 Leaves whorled; half-shrub CHIMAPHILA UMBELLATA
- 37 Leaf margin entire or nearly so
- 40 Leaves opposite
- 41 Leaf margin partly rolled, entire; subalpine-alpine KALMIA POLIFOLIA
- 41 Leaf margins flat, slightly toothed; foothills to subalpine PENSTEMON FRUTICOSUS
- 40 Leaves alternate
- 42 Leaf margin rolled; foothills CERCOCARPUS LEDIFOLIUS
- 42 Leaf flat; subalpine LEDUM GLANDULOSUM

6 Leaves deciduous

43 Buds and twigs opposite

44 Bark of main stem fibrous or shreddy

45 Young stem bark checking in rectangular pattern; buds hidden under leaf scar PHILADELPHUS LEWISII

45 Young stem bark not checking in rectangular patterns; buds not hidden

46 Stems hollow SYMPHORICARPOS spp. (p. 17)

46 Stems solid

47 Pith hexagonal; edges of leaf scar with conspicuous hairs

48 Bark exfoliating in gray fragments LONICERA INVOLUCRATA

48 Bark exfoliating in reddish fragments LONICERA CAERULEA

47 Pith round; edges of leaf scar without conspicuous hairs

49 Bud scales with white margins; 3 bundle traces LONICERA UTAHENSIS

49 Bud scales without white margins; 1 bundle trace SYMPHORICARPOS spp. (p. 17)

44 Bark of main stems not fibrous or shreddy

50 Pith large (3/4 of twig diameter); leaf scar prominent

51 Leaf scar bundle traces 3-5; young stem gray-brown, dull SAMBUCUS RACEMOSA

51 Leaf scar bundle traces 5-7; young stems dark-brown, glossy SAMBUCUS CERULEA

50 Pith small (1/2 or less of twig diameter); leaf scars small or absent

52 Young stems with scurfy scales

53 Shrubs with thornlike twigs; valley thickets SHEPHERDIA ARGENTEA w-3

53 Shrubs without thornlike twigs; forests SHEPHERDIA CANADENSIS

52 Young stems without scurfy scales

54 Buds naked, enclosed by a pair of rudimentary leaves CORNUS STOLONIFERA

54 Bud scales valvate or paired

55 Bud scales paired

56 Bud scales with whitish margin and veins; forests LONICERA UTAHENSIS

56 Bud scales without whitish margin or veins; valleys, e. Montana ACER NEGUNDO

55 Bud scales valvate

57 Distinctly shrublike VIBURNUM EDULE

57 Tall shrubs or treelike; montane or lower elevations

58 Bundle traces several in curved lines FRAXINUS PENNSYLVANICA

58 Bundle traces 3

59 Young twigs and buds bright red ACER GLABRUM

59 Young twigs and buds not red ACER NEGUNDO

43 Buds and twigs alternate

60 Shrubs with spines, thorns, or armed branchlets

61 Thorns or armed branchlets present

62 Thorns, reddish-brown

63 Thorns 3/4-1 1/2 in. long; common CRATAEGUS DOUGLASII

63 Thorns 2-3 in. long CRATAEGUS COLUMBIANA

62 Armed branchlets, grayish to light tan

64 Bark brown to gray on young branches PRUNUS AMERICANA

64 Bark whitish or scurfy on young branches

65 Shrubs seldom over 2 feet high, with rounded crown ATRIPLEX CONFERTIFOLIA

65 Shrubs usually over 2 feet high, open crown

66 Buds below branch base, older stems gray to black SARCOBATUS VERMICULATUS

66 Buds in branch axil, older stems gray to reddish-gray ATRIPLEX CANESCENS

61 Spines or prickles present

67 Spines yellow, cedar-hemlock forests OPLOPANAX HORRIDUM

67 Spines white, brown or red

68 Spines with a shieldlike base; buds small, shiny ROSA spp. (p. 17)

68 Spines without shieldlike base; buds neither small nor shiny

69 Spines at node and along stem, nodal spines usually in 3's RIBES spp. (p. 16)

69 Spines along stem, no distinct nodal spines RUBUS IDAEUS

60 Shrubs without spines, thorns, or armed branchlets

- 70 Stipules persistent; pith brown
 - 71 Pith more than 1/2 stem diameter RUBUS PARVIFLORUS
 - 71 Pith less than 1/2 stem diameter *Perhaps Rhus glabra*
 - 72 Older stems fibrous; stipule tips membranous ~~POTENTILLA FRUTICOSA~~
 - 72 Older stems flaky; stipule tips hardened, rigid PURSHIA TRIDENTATA
- 70 Stipules not persistent or absent; pith variously colored
 - 73 Half-shrubs, woody only at base, twigs dying back to base each year
 - 74 Base of main branches with white woolly mass HYMENOXYIS RICHARDSONII
 - 74 Base of main branches not white woolly
 - 75 Young stem brownish GUTIERREZIA SAROTHRAE
 - 75 Young stem whitish
 - 76 Shrubs appearing brownish
 - 77 Hairs on young twigs retrorse arising from a white surface, resin drops in leaf scar axils CHRYSOTHAMNUS VISCIDIFLORUS
 - 77 Hairs on young twigs loose, woolly-matted, resin drops absent ERIOGONUM MICROTHECUM
 - 76 Shrubs appearing whitish
 - 78 Leaf bases conspicuous; heartwood brown TETRADYMIA CANESCENS
 - 78 Leaf bases inconspicuous; heartwood green CHRYSOTHAMNUS NAUSEOSUS
- 73 Shrubs, woody throughout, not dying back +
 - 79 Twigs and buds with long, reddish hairs RHODODENDRON ALBIFLORUM
 - 79 Twigs and buds without long, reddish hairs
 - 80 Young stems and buds scurfy ELAEAGNUS COMMUTATA
 - 80 Young stems and buds not scurfy

12

- 81 Lateral buds sunken or obscure (except clustered, catkinlike flower buds)
 - 82 Lateral buds partially sunken and almost encircled by leaf scar; twigs glabrous RHUS GLAERA
 - 82 Lateral buds hidden by persistent leaf base; twigs pubescent, aromatic RHUS TRILOBATA
- 81 Lateral buds not sunken or obscure
 - 83 Buds woolly or long-hairy throughout
 - 84 Bud scales hairy, bark rough (with persistent "berries") RHUS RADICANS
 - 84 Bud scales woolly, bark shreddy
 - 85 Bud scales reddish on lower half; stipules or scars absent; panicle HOLODISCUS DISCOLOR
 - 85 Bud scales not reddish; part of stipule persistent; corymb PHYSOCARPUS MALVACEUS
 - 83 Buds not woolly or long-hairy throughout
 - 86 Pith star-shaped
 - 87 Bundle traces 3 POPULUS spp. (p. 16)
 - 87 Bundle traces more than 3 (several) QUERCUS MACROCARPA
 - 86 Pith not star-shaped
 - 88 Catkins present in winter
 - 89 Pith triangular; last season's catkins (cones) persistent
 - 90 Leaf bud pointed, sessile; cone shorter than its stalk ALNUS CRISPA
 - 90 Leaf bud round-tipped, stalked; cone longer than its stalk ALNUS TENUIFOLIA *w-5*
 - 89 Pith round; last season's catkins deciduous
 - 91 Older bark whitish; lenticels pale orange BETULA PAPYRIFERA
 - 91 Older bark brown; lenticels white
 - 92 Tall shrubs; streambanks BETULA OCCIDENTALIS
 - 92 Low shrubs; mountain meadows BETULA GLANDULOSA

13

- 88 Catkins not present in winter
- 93 Buds valvate VACCINIUM spp. (p. 17)
- 93 Buds not valvate
- 94 Bud scale single, or naked bud
- 95 Bud naked RHAMNUS PURSHIANA
- 95 Bud with single scale SALIX spp.
- 94 Bud scales several
- 96 Terminal bud large (over ½ inch long)
- 97 Bud scales hairy, at least on upper margin; bud pointed
- 98 Stipule scars evident; twigs with rust-colored hairs SORBUS SITCHENSIS
- 98 Stipule scars wanting; twigs with white hairs SORBUS SCOPULINA
- 97 Bud scales not hairy; buds strongly tapered
- 99 Bud resin reddish and aromatic POPULUS TRICHOCARPA
- 99 Bud resin brownish POPULUS spp. (p. 16)
- 96 Terminal bud smaller (½ inch or less)
- 100 Wood rays conspicuous, pith cells porous RIBES spp. (p. 16)
- 100 Wood rays not conspicuous, pith dense
- 101 Young twigs ash gray, stipule scars present RHAMNUS ALNIFOLIA
- 101 Young twigs green, brown, or red
- 102 Upper portion of bud scale light colored
- 103 Bundle traces 3; lenticels conspicuous PRUNUS VIRGINIANA
- 103 Bundle trace 1; lenticels inconspicuous MENZIESIA FERRUGINEA
- 102 Bud scales uniform in color
- 104 Leaf scars prominent

- 105 Treelike; young twigs reddish-brown, varnished POPULUS TREMULOIDES
- 105 Shrubs; young twigs greenish-gray with yellow dots RIBES HUDSONIANUM
- 104 Leaf scars not prominent
- 106 Old inflorescence commonly present
- 107 Plants thick-stemmed from base; buds woolly CEANOTHUS SANGUINEUS
- 107 Plants light-stemmed from base; buds not woolly
- 108 Old inflorescence flat-topped SPIRAEA BETULIFOLIA
- 108 Old inflorescence not flat-topped SPIRAEA DOUGLASII
- 106 Old inflorescence not commonly present
- 109 Bud scale mucronate RIBES spp. (p. 16)
- 109 Bud scale not mucronate
- 110 Margin of upper bud scales ciliate AMELANCHIER ALNIFOLIA
- 110 Margin of bud scales not as above
- 111 Branching divergent; mountain slopes PRUNUS EMARGINATA
- 111 Branching erect; valley bottoms PRUNUS PENNSYLVANICA

KEY TO GENUS POPULUS

- 1 Buds not resinous or gummy P. TREMULOIDES
- 1 Buds resinous or gummy
 - 2 Buds less than 1/2 inch in length
 - 3 Buds hairy, twigs straw-colored or gray P. SARGENTII
 - 3 Buds not hairy, twigs greenish-yellow P. ACUMINATA
 - 2 Buds more than 1/2 inch in length
 - 4 Twigs greenish-orange P. TRICHOCARPA
 - 4 Twigs not greenish-orange
 - 5 Resin strongly aromatic P. BALSAMIFERA
 - 5 Resin not strongly aromatic P. ANGUSTIFOLIA

Populus balsamifera ssp. *trichocarpa*

KEY TO GENUS RIBES

- 1 Stems unarmed
 - 2 Leaf scars conspicuous R. HUDSONIANUM
 - 2 Leaf scars narrow, not conspicuous
 - 3 Twigs white, glabrous R. INERME
 - 3 Twigs dark, pubescent
 - 4 Twigs glandular pubescent
 - 5 Old stems reddish-brown, shreddy R. VISCOSISSIMUM
 - 5 Old stems gray or gray-brown, smooth R. AMERICANUM
 - 4 Twigs not glandular pubescent
 - 6 Intricately branched; slopes or rock outcrops R. CEREUM
 - 6 Simply branched; valley bottoms and ravines R. AUREUM
 - 1 Stems armed
 - 7 Nodal spines solitary, weak, few on internode R. INERME
 - 7 Nodal spines variable in number, rigid
 - 8 Bark on young stems reddish to orange brown R. SETOSUM
 - 8 Bark on young stems brown, gray, or straw-colored
 - 9 Twigs with gland-tipped bristles; alpine R. MONTIGENUM
 - 9 Twigs without gland-tipped bristles; not alpine
 - 10 Spines 3-9 at nodes R. LACUSTRE
 - 10 Spines 1-3 at nodes R. IRRIGUUM

KEY TO GENUS ROSA

- 1 Sepals deciduous on fruit; lax medium shrub of moist woods R. GYMNOCARPA
- 1 Sepals persistent on fruit
 - 2 Infrastipular prickles (those below the stipules on the node), when present, undifferentiated; stems generally bristly with spines.
 - 3 Fruits solitary, sometimes 2; low shrub of forested regions, common in western Montana R. ACICULARIS
 - 3 Fruits several in cymose (flat-topped) clusters; most stems dying back each year (like a half-shrub); common to the Great Plains and dry adjacent valleys R. ARKANSANA
 - 2 Infrastipular prickles, when present, well differentiated; stems generally not very bristly.
 - 4 Fruits usually several, clustered; common; widely distributed in lowlands and hills through the State R. WOODSII
 - 4 Fruits usually solitary; less common; in moist woods, occurring at higher elevations than *R. woodsii* R. NUTKANA

KEY TO GENUS SYMPHORICARPOS

- 1 Stems hollow
 - 2 Young twigs glabrous; mainly forests S. ALBUS
 - 2 Young twigs hairy; open grasslands S. OCCIDENTALIS
- 1 Stems solid
 - 3 Old flowers sessile, crowded; fruit red S. ORBICULATUS
 - 3 Old flowers stalked, solitary or in pairs; fruit white S. OREOPHILUS

KEY TO GENUS VACCINIUM

- 1 Buds imbricate; twigs pubescent, round V. OCCIDENTALE
- 1 Buds valvate
 - 2 Young stems round
 - 3 Young twigs smooth and glabrous; common V. CAESPITOSUM
 - 3 Young twigs rough and pubescent; rare V. MYRTILLOIDES
 - 2 Young stems angled
 - 4 Low shrub, 1/2-1 foot high
 - 5 Young stems bright green, glabrous, strongly ascending V. SCOPARIUM
 - 5 Young stems dull green, minutely pubescent, not strongly ascending V. MYRTILLUS
 - 4 Tall shrubs, 1-6 feet
 - 6 Buds round-tipped, leaf scar crescent-shaped V. OVALIFOLIUM
 - 6 Buds sharply tipped
 - 7 Stems red, leaf scar crescent-shaped V. MEMBRANACEUM
 - 7 Stems not distinctly reddish, leaf scar heart-shaped V. GLOBULARE

Descriptions and Illustrations

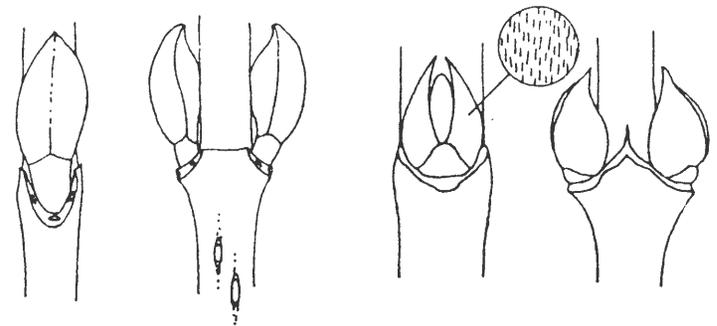
ACER GLABRUM, Mountain Maple, (*A. douglasii*). Tall shrubs of the ponderosa pine and Douglas-fir zones along watercourses and on rocky slopes throughout mountainous parts of the State. Deciduous; buds opposite, stalked; bud scales valvate, red, glabrous on the back, inner margin cobwebby; leaf scar crescent-shaped (nearly encircling the twig), bundle traces 3; young stems red, lenticels inconspicuous, pith round, creamy-white, less than $\frac{1}{2}$ stem diameter; inflorescence a corymb; fruit a pair of winged seeds. Important winter browse for deer, elk, and moose.

ACER NEGUNDO, Boxelder. A tree growing in coulees and along streams in the plains and occasionally in valleys of mountainous parts of the State. Deciduous; buds opposite, sessile to stalked; bud scales paired, densely covered with white hairs; leaf scar crescent-shaped encircling the twig, bundle traces 3; young stems greenish to purplish, glaucous to hairy (short white hairs) or both, lenticels inconspicuous, pith round, creamy-white, less than $\frac{1}{2}$ stem diameter; bark of older stems gray and furrowed; inflorescence a raceme; fruit a pair of winged seeds. Grazing value limited for livestock or big game.

ALNUS CRISPA, Mountain Alder, (*A. sinuata*). Tall shrubs (smaller than *A. tenuifolia*) of the high mountains on moist slopes, stream sides, and snowslide areas in the Douglas-fir and spruce-fir zones. Deciduous; buds alternate, sessile, sharp-pointed; bud scales imbricate, reddish-purple, resinous (often with a drop of resin near tip); leaf scar hemispherical to kidney-shaped, prominent, bundle traces 3; stipule scars present; young stems glabrous, brown to greenish, ridged, pith white to brown, triangular to linear, less than $\frac{1}{5}$ stem diameter; older stems dark greenish-gray, glabrous, smooth; cones (pistillate catkins) persistent, stalk longer than the cone, new (next year's) staminate catkins present; seed winged. Grazing value low for livestock and big game.

ALNUS TENUIFOLIA, Thinleaf Alder. Tall shrubs (treelike) common along streams and other waterways in the mountains. Deciduous; buds alternate, stalked, round or blunt point; bud scales 3, imbricate (appear valvate) large, unequal, pubescent, dark red to brown; leaf scar kidney-shaped, raised, bundle traces 3; young stems densely pubescent, purplish-red, lenticels light-colored and round, pith triangular, greenish to brown, less than $\frac{1}{2}$ stem diameter; older stems gray-green to brown, lenticels transversely elongated; cones (pistillate catkins) persistent, stalk shorter than the cone, both new staminate and pistillate catkins present; seed wingless or slightly so. No grazing value for livestock or big game; seeds used by birds.

AMELANCHIER ALNIFOLIA, Serviceberry. A medium to tall shrub of ponderosa pine and Douglas-fir zones, and on rocky outcrops or stream banks of adjacent grasslands. Deciduous; buds alternate, sessile; bud scales imbricate, inner margin hairy; leaf scar crescent-



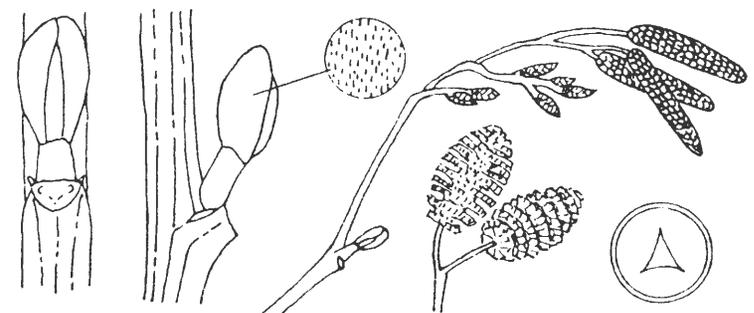
Acer glabrum

A. negundo



Alnus crispa

Amelanchier alnifolia



Alnus tenuifolia

shaped, bundle traces 3; young stems glaucous or glabrous to slightly hairy, lenticels small and round, pith round, whitish, less than 1/2 stem diameter; older stem bark pinkish-gray, smooth to shallowly furrowed; inflorescence racemelike; fruit berrylike, deep purple with persistent sepals, somewhat persistent. An important browse species for deer and elk, used by livestock; fruit relished by birds.

ARCTOSTAPHYLOS UVA-URSI, Kinnikinnick, Bearberry. A low, prostrate, trailing shrub mainly of ponderosa pine and Douglas-fir forests at moderate to low elevations in the mountains. Evergreen; leaves alternate, spatula-shaped, thick and leathery, dark green above, lighter below, margin entire; buds in leaf axils small; bud scales paired, herbaceous, light red; young stems reddish to dark brown, lenticels inconspicuous, pith brown, less than 1/2 stem diameter; older stem bark becoming shreddy with age; inflorescence a raceme; fruit red, apple-shaped, containing 4 to 10 bony nutlets. Forage value good for deer and elk; important food for grouse.

ARTEMISIA ARBUSCULA, Low Sagebrush. A low aromatic shrub of dry plains and hills in southern part of the State. Evergreen; leaves alternate, shallowly 3-tipped, felty, silvery-green (color, due to hairiness); buds naked, appearing as felted masses in leaf axils; young stems light green, felty; older stem bark fibrous and dark brown, pith small and dark; inflorescence racemelike, old flower stalks light brown and slightly pubescent. This species may have forage value for antelope, deer, and sheep.

ARTEMISIA ARBUSCULA var. **NOVA**, Black Sagebrush, (*A. nova*). This shrub closely resembles *A. arbuscula* in stature, habitat, and morphology, but is distinguished from it by the following characteristics: leaves dark green and not so hairy; inflorescence a panicle with the old flower stalks reddish-brown and loosely woolly. Limited forage value for deer and elk; may be important winter forage for antelope and sheep.

ARTEMISIA CANA, Silver Sagebrush. Medium shrubs of plains and valley bottoms in eastern Montana, preferring a moister site than *A. tridentata*. Evergreen; leaves alternate, strap-shaped, silvery-green, felty, margin entire to slightly toothed; buds naked consisting of 2 or 3 small leaves in leaf axils; young stems silvery, felty; old stems dark gray, pith small, round, and brown; inflorescence a persistent raceme. Important forage for big game and livestock in eastern Montana.

ARTEMISIA FRIGIDA, Fringed Sagebrush. A low-growing aromatic half-shrub widely distributed throughout Montana; extending from the ponderosa pine zone to the plains and prairies; common and increasing in overgrazed rangelands. Evergreen; leaves alternate in crowded clusters, divided 2 or 3 times into segments having pointed tips, pubescent, silvery-green; young stems leafy, slender, gray, pubescent, dying back nearly to the ground each winter; older stems dark gray, confined close to the ground; inflorescence a raceme. Palatable to antelope, deer, and sheep.

ARTEMISIA MICHAUXIANA, Michaux Sagebrush. A low half-shrub of rocky slopes at moderate to high elevations in the State. Evergreen; leaves alternate, deeply divided once into pinnate segments, green above and densely hairy, lighter below giving the leaf a 2-toned appearance; inflorescence a raceme. Possibly of forage value to deer, mountain goat, and mountain sheep.

ARTEMISIA SCOPULORUM, Alpine Sagebrush. A very low-growing half-shrub of rocky, open subalpine, and alpine areas in southwestern Montana. Evergreen; leaves alternate, divided 2 to 3 times into narrow segments, felty on both surfaces; young stems die back nearly to the ground each winter. Forage value unknown; possibly of limited grazing value for big game.

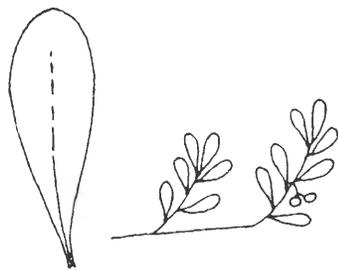
ARTEMISIA SPINESCENS, Bud Sagebrush. A low, stout, densely branched, aromatic shrub of extremely dry sites in southwestern Montana. Deciduous or partly so; leaves alternate, divided 2 or 3 times into segments with rounded tips; buds large and rounded; branches of old flowering stems spiny or thornlike. Forage value high for livestock, particularly sheep.

ARTEMISIA TRIDENTATA, Big Sagebrush. Medium aromatic shrubs of plains, foothills, and mountain parks and as an understory in open ponderosa and Douglas-fir forest stands. Tallest of the sagebrushes, becoming treelike in well-drained, alkali-free areas with abundant moisture such as drainage channels and ditch banks. Evergreen; leaves alternate, gray-green, 3-lobed, notch-tipped, felty; buds naked, bundle of very small leaves in leaf axil; young stems densely white pubescent; older stems gray, shreddy; pith brown, small, round, or usually eccentric; inflorescence a panicle, persistent, pubescent, gray to brown, leafy. Important winter forage for antelope, deer, and sheep.

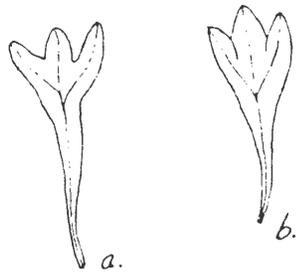
ARTEMISIA TRIPARTITA, Threetip Sagebrush. Medium shrubs (smaller than *A. tridentata*) of plains and foothills in southwestern Montana. Evergreen; leaves alternate, deeply divided into 3 linear segments, silvery green, pubescent; young and older stems and other characteristics similar to *A. tridentata*. This species freely resprouts after burning whereas *A. tridentata* does not. Grazing value same as *A. tridentata*.

ATRIPLEX CANESCENS, Fourwing Saltbush. A medium shrub of dry hills and plains or moderately saline or alkaline, "greasewood," sites in eastern Montana, uncommon. Deciduous or occasionally persistent to evergreen; leaves alternate, strap-shaped, scurfy; buds naked, appearing as small scurfy structures in leaf axils; leaf scar crescent-shaped; young stems whitish, scurfy; older stems reddish-gray, some branches thornlike, pith small; fruit semipersistent, 4-winged. Highly palatable forage for livestock and game.

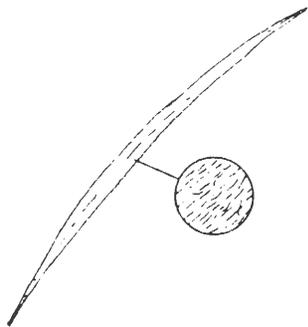
ATRIPLEX CONFERTIFOLIA, Shadscale Saltbush. A low shrub of badlands and marine clay soils in eastern Montana, uncommon. Deciduous or nearly so, leaves alternate, oval-shaped, scurfy; young and older stems stiff, thorny, scurfy; buds naked, small; leaf scar inconspicuous; fruit semipersistent, winged. Limited forage value for livestock or game.



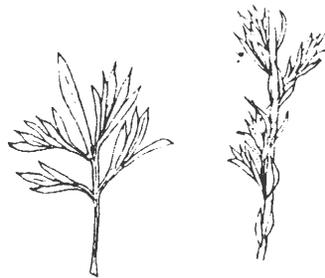
Arctostaphylos uva-ursi



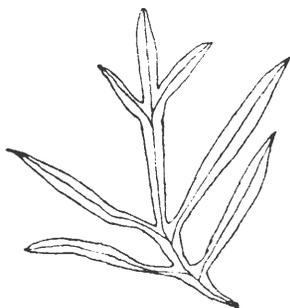
Artemisia arbuscula
a. var. nova b. var. arbuscula



Artemisia cana



A. frigida



Artemisia michauxiana



A. scopulorum

ATRIPLEX NUTTALLII, Nuttall Saltbush. A semiprostrate half-shrub of the Plains and upper Missouri River drainage on heavy clay or alkaline soils, common. Evergreen; leaves alternate, strap-shaped, scurfy; buds naked, inconspicuous; young stems herbaceous, scurfy; fruit semipersistent, knobby (resembling a beet seed). High grazing value for antelope and livestock.

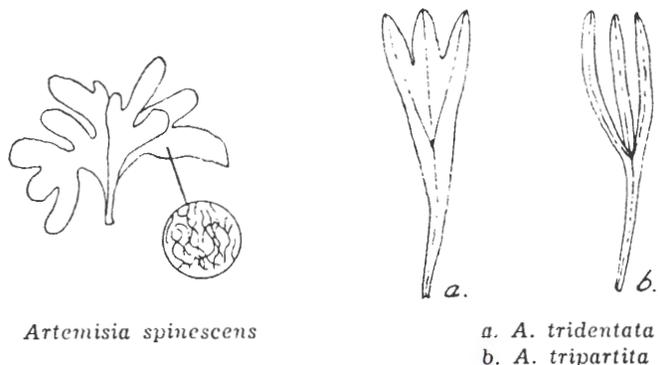
BETULA GLANDULOSA, Bog Birch. Medium shrubs (usually under 3 feet) of moist or wet sites along subalpine streams and meadows in the mountainous parts of the State. Deciduous; buds alternate, sessile, small; bud scales imbricate, brown to reddish, glossy to glandular, margin of lower scales ciliate; leaf scar inconspicuous obscured by resinous covering; young stems tan to gray-brown, densely glandular with resinous dots; older stems gray to gray-brown, bark checking in transverse sheets, lenticels prominent, white, pith less than ½ stem diameter; inflorescence a catkin, scales deciduous or a few basal ones weakly attached to the persistent axis; fruit a small wingless seed. Grazing value little to low for livestock or big game; grouse use buds in winter.

BETULA OCCIDENTALIS, Water Birch, (*B. fontinalis*). Tall shrubs (treelike) along streams and rivers at lower elevations in the mountainous parts of the State. Deciduous, buds alternate, sessile or short-stalked; bud scales imbricate, brown, somewhat resinous, margins ciliate; leaf scars crescent-shaped, raised, bundle traces 3; young stems reddish-brown (grayish), moderately to densely glandular with resinous dots, lenticels conspicuous, often covered by resinous dots; older stems bronze to gray-brown to gray, smooth, bark peeling in transverse sheets, lenticels conspicuous, horizontally elongated, pith light brown, triangular to irregular, small; inflorescence a catkin, axis of pistillate catkin, persistent, new (next year's) staminate catkin cylindrical. Fruit a small, winged seed. Little forage value.

BETULA PAPYRIFERA, Paper Birch. A small to medium tree of moist areas on mountain slopes and valley bottoms in northwestern Montana (possibly at widely scattered locations elsewhere in the State). Deciduous; buds alternate; bud scales brown, resinous, margin ciliate; young stems brown, resinous, lenticels pale orange; older stems white, bark peeling off in papery sheets, lenticels elongated horizontally; inflorescence a catkin; fruit a small winged seed. No grazing value.

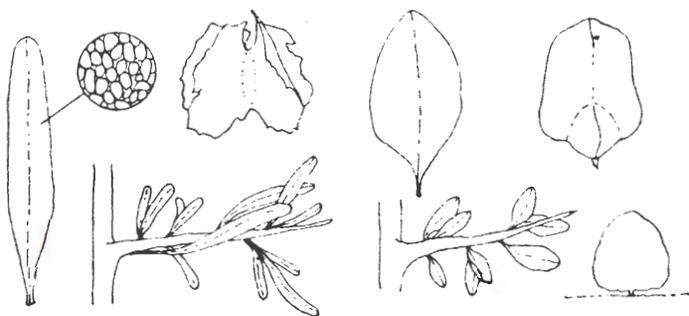
CASSIOPE MERTENSIANA, White Mountain Heather. A low, spreading shrub (sometimes mat-forming) of high mountains. Evergreen; leaves opposite, 4-ranked, scalelike, glabrous, yellow-green, individual leaves long persistent (even when dead, then brown or gray); young stem completely covered by overlapping leaves (similar to Rocky Mountain Juniper); older stems brown or weathered gray; inflorescence solitary; fruit borne on individual stalks in leaf axils near end of twig. Unpalatable to livestock, forage value for alpine big game unknown; flowers used by ptarmigan.

CASSIOPE TETRAGONA. A low, spreading shrub of high mountains; distribution believed to be much more restricted than *C. mertensiana*, reported entering Montana at Glacier National Park and possibly in the Whitefish Range and at the highest elevations in Lincoln County. Similar in most characteristics to *C. mertensiana* and distinguished from



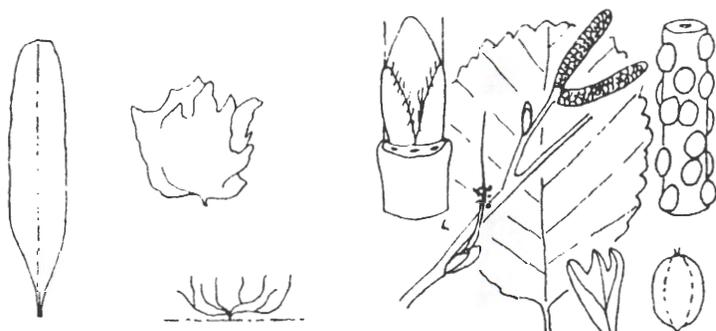
Artemisia spinescens

a. *A. tridentata*
b. *A. tripartita*



Atriplex canescens

A. confertifolia



Atriplex nuttallii

Betula glandulosa

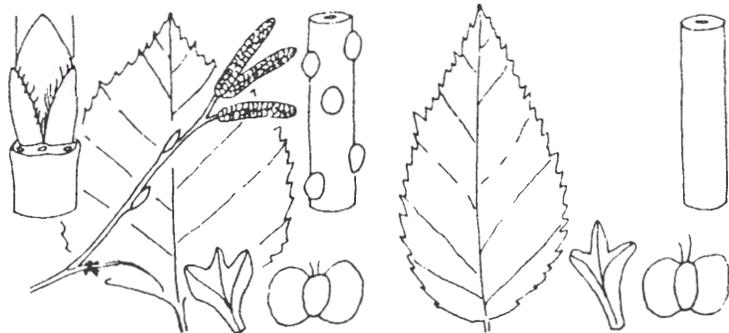
it by leaves slightly pubescent, with a prominent medial groove on the back; young twig leaves not so tightly overlapped. Grazing value unknown.

CEANOTHUS SANGUINEUS, Redstem Ceanothus. Medium shrubs of burned-over areas in the cedar-hemlock and Douglas-fir zones in northwestern Montana. Deciduous; buds alternate, flower buds globose and usually stalked, leaf buds smaller, pointed and usually sessile; bud scales valvate in leaf buds, paired in flower buds, usually not fully covering the bud or easily broken off exposing the very densely hairy undeveloped leaves, dark red to purple, glabrous to moderately hairy on back; leaf scar elliptic to triangular shaped, dark, bundle traces 3; stipule scars dark, distinct, inconspicuous; young stems dark red varying from greenish to varnished purple-brown, glaucous to pubescent near tip, glandular near base, angled; older stems gray to purple-brown and gray-mottled, pith angled, white, less than $\frac{1}{4}$ stem diameter; inflorescence paniclelike, persistent, fruit stalks topped with a 3-depressed cup; fruit 3-lobed capsule, occasionally persistent. Excellent winter forage for deer and elk.

CEANOTHUS VELUTINUS, Evergreen or Snowbrush Ceanothus. Medium shrubs of dry slopes and in burns of Douglas-fir and spruce-fir zones in the mountainous parts of the State. Evergreen; leaves alternate, elliptic, thick, sweet aromatic, showing 3 prominent veins, upper surface dark green and resinous, lower surface pale green and pubescent, margin toothed, teeth tipped with black glands; stipules persistent, small, pointed, black; buds naked, tawny, very hairy, stipules evident; leaf scar elliptic, raised, dark, bundle traces 3, tending to run together; young stems green to buff or brown, pubescent; older stems greenish to reddish-brown with pustular surface, pith white with brown ring, less than $\frac{1}{2}$ stem diameter; inflorescence paniclelike, persistent, fruit stalk topped with a 3-depressed cup; fruit 3-lobed capsule, occasionally persistent. Important forage for deer and elk; unimportant for livestock.

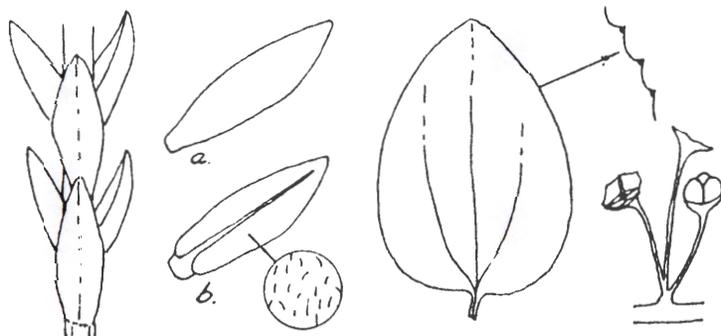
CERCOCARPUS LEDIFOLIUS, Curleaf Mountain Mahogany. Tall shrubs (treelike) of rocky slopes and outcrops in hilly grasslands and montane forests in southern Montana. Evergreen; leaves alternate, narrowly elliptic, rolled, leathery, upper surface glabrous, lower surface densely woolly; buds small, woolly in leaf axils; young stems dull red-brown; older stems gray, furrowed and scaly, pith irregular shape, light green, less than $\frac{1}{2}$ stem diameter; fruit a seed with a feathery tail, often persistent. Grazing value high, particularly for deer.

CHIMAPHILA UMBELLATA, Pipsissewa, Princes Pine. A low half-shrub of coniferous forests. Evergreen; leaves whorled, spatula-shaped to reversed lance-shaped, margin toothed, dark green above, paler green below, leathery, thick, short stalked; buds sessile, all but the terminal inconspicuous; bud scales, imbricate, green, margin glandular ciliate, terminal bud scales persistent, dark brown; leaf scars hemispherical to nearly spherical, dark brown, slightly raised, bundle traces continuous and crescent-shaped; young stems bright green, glabrous, smooth, pith green, round, $\frac{1}{2}$ stem diameter, wood green; inflorescence a raceme, persistent; fruit a 5-chambered capsule, persistent. Grazing value fair for elk, but low for deer.



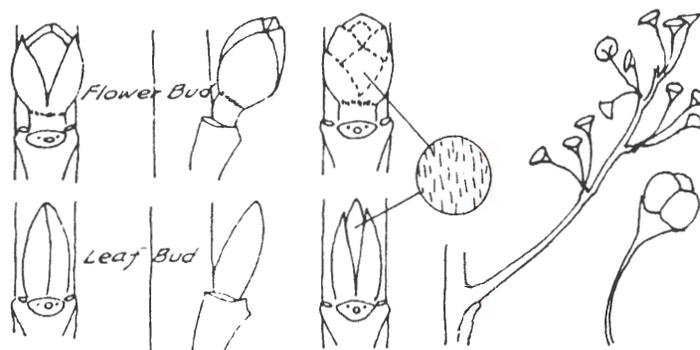
Betula occidentalis

B. papyrifera



a. *Cassiope mertensiana*
b. *C. tetragona*

Ceanothus velutinus



Ceanothus sanguineus

CHRYSOTHAMNUS NAUSEOSUS, Rubber Rabbitbrush, (*C. graveolens*). A low half-shrub of plains, foothills, and mountain grasslands. Deciduous; leaves occasionally persistent, then alternate, greenish-white, linear, entire, densely felted, eventually breaking off leaving persistent leaf base; buds obscure or hidden behind leaf base; bud scales pale brownish, densely woolly; young stems greenish, pubescence dense, matted, older stems gray, bark rough or shreddy, pith star-shaped with many points, white to brown; inflorescence a panicle, persistent, remnants of old flower heads often present. Grazing value low to fair for big game; low for livestock.

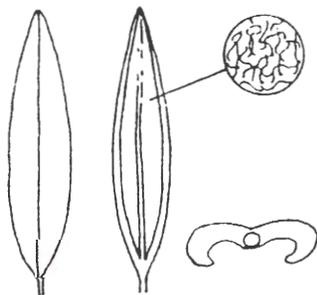
CHRYSOTHAMNUS VISCIDIFLORUS, Douglas Rabbitbrush. Low half-shrubs of plains and mountain grasslands. Deciduous; leaves occasionally persistent on young growth, twisted, bright green; buds alternate, small, pubescent, obscure; leaf base persistent, axil frequently filled with resin droplet; young stems light tan to grayish white, slightly striate, sparsely pubescent; older stems outer bark dark gray, inner bark brown, pith star-shaped with many points, off-white, less than $\frac{1}{3}$ stem diameter, wood yellow-brown, annual rings prominent. Forage value generally low for livestock and game.

CLEMATIS COLUMBIANA, Rock Clematis, Virginsbower. (*C. verticillaris*). A low climbing vine of ponderosa pine and Douglas-fir zones. Deciduous; buds opposite, sessile, small, obscured by leaf stalk base; bud scales imbricate, pubescent; leaf stalks persistent with 3 tendrillike leaflet stalks, stumps of broken leaf stalks show 5 bundle traces; young stems prominently 6-angled, orange-brown to chestnut, pubescent at nodes; older stems brown, smooth; pith white, 6-sided, more than $\frac{2}{3}$ stem diameter. Doubtful grazing value for game.

CLEMATIS LIGUSTICIFOLIA, Western Virginsbower. Tall climbing vines of bottomlands and fences in Montana. Deciduous; buds alternate, sessile, larger than *C. columbiana*; bud scales imbricate, pubescent; leaf stalks persistent with 5-7 tendrillike leaflet stalks, stumps of leaf stalks show 3 bundle traces; young stems brown, angled, pubescent at the nodes; older stems gray, shreddy, nodes swollen and gnarled; pith white, 6-sided to star-shaped, more than $\frac{2}{3}$ stem diameter; wood white, ring porous (pores visible to the unaided eye). No grazing value; valued as cover for small mammals and birds.

CORNUS STOLONIFERA, Redosier Dogwood. A medium to tall multistemmed shrub of streamsides. Deciduous; buds opposite, naked, reddish, pubescent, terminal flower buds stalked, bulblike (resembling an old Edison light bulb), lateral leaf buds sessile, narrow, elongated, flattened; leaf scars narrow, pairs give stem a jointed appearance; young stems dark red, lenticels not evident; pith white, more than $\frac{1}{2}$ stem diameter; older stems dark red, lenticels white and round; pith white, less than $\frac{1}{2}$ stem diameter; very old stems gray; inflorescence a cyme, somewhat persistent. Highly valuable shrub for deer and elk; some use by cattle.

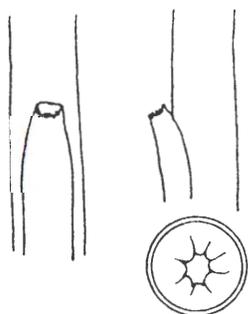
CRATAEGUS COLUMBIANA, Columbia Hawthorn. Moderate to tall shrub of plains and valley bottoms. Deciduous; buds alternate,



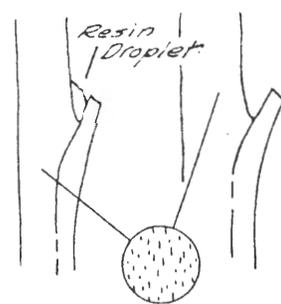
Cercocarpus ledifolius



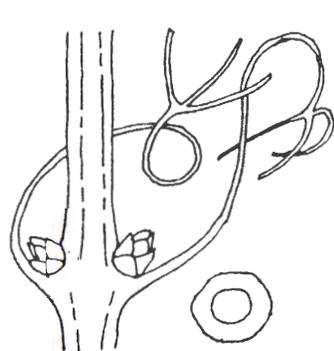
Chimaphila umbellata



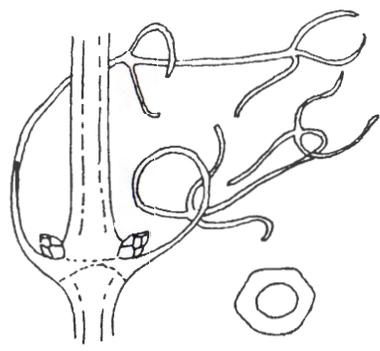
Chrysothamnus nauseosus



C. viscidiflorus



Clematis columbiana



C. ligusticifolia

sessile, small, round; bud scales imbricate, dark red, glabrous, shiny; leaf scars crescent-shaped, narrow, bundle traces 3; young stems smooth shiny, brown, lenticels light gray; older stems gray with olive-brown inner bark showing through; pith irregular, white to tan, less than 1/5 stem diameter; thorns long (more than 1 1/4 inches), red-brown becoming gray with age, recurved to straight; fruit berrylike, dark red, deciduous. Browsed by deer and cattle in eastern Montana; fruit used by birds.

CRATAEGUS DOUGLASII, Douglas Hawthorn. A tall shrub to small tree of bottoms, flats, and draws in western Montana. Deciduous; buds alternate, sessile, small, round; bud scales imbricate, reddish-purple, shiny; leaf scar crescent-shaped, faint, bundle traces 3-5, faint; young stems reddish-brown with gray flecks, shiny; older stems smooth, gray, flecked with brown; pith irregular, white, 1/5 stem diameter; thorns short (1 inch or less), red-brown becoming gray with age, recurved to straight; fruit berrylike, blackish, deciduous. Low value for game, used on overgrazed ranges; fruit used by bears and birds.

DRYAS DRUMMONDII. Similar in nearly all respects to *D. octopetala* and distinguished from it by leaves which are 2-3 times larger, elliptic with wedge-shaped bases and are not so densely crowded on the stem. Apparently not as common as *D. octopetala*. No known grazing value.

DRYAS OCTOPETALA. Prostrate, tufted or mat-forming woody plants (scarcely shrublike) of glacial outwash gravels at lower elevations and of alpine meadows, rockslides, and exposed ridges at the higher elevations in the mountains. Evergreen; leaves alternate, narrow, lance-shaped, upper surface appearing green, sparsely hairy, lower surface appearing white, dense, woolly mat of hairs, leaf margin round-toothed, very tightly rolled; leaf bases and stipules persistent, densely crowded on stems; stems freely rooting; older stems brown, platy or flaky; fruit a seed with a feathery tail. Little grazing value; use by pikas reported.

ELAEAGNUS COMMUTATA, Silverberry, (*E. argentea*). Tall shrubs of bottomlands in grassland and montane zones. Deciduous, buds alternate, naked, composed of a pair of valvate rudimentary leaves which appear scalelike, scurfy, rusty brown, somewhat keeled; leaf scar semicircular, bundle traces 3; young stems brownish-silvery, scurfy; older stems grayish to brownish-green, scurfy, pith brown, irregular; fruit berrylike, leathery, silvery-green. Grazing value low for game.

ERIOGONUM MICROTHECUM, Slenderbush Eriogonum. A low shrub of plains and dry foothills. Deciduous; leaves somewhat persistent, linear, margin entire and tightly rolled, upper surface green, lower surface woolly and white; leaf bases alternate, long persistent, brown; buds small, brown, completely hidden by leaf base; young stems white, dense cover of loose woolly hairs; older stems white to gray with long, persistent, woolly hairs; pith dark, less than 1/2 stem diameter; very old stems, bark shreddy to flaky, light gray, inner bark darker and

purplish, often quite gnarled and contorted. Grazing value high for antelope and livestock.

EUROTIA LANATA, Winterfat. Low half-shrub of grasslands on fine to medium-textured soils in eastern Montana and the upper Missouri drainage. Evergreen; leaves alternate, linear, light green, densely hairy; young stems greenish to brownish, densely hairy, somewhat herbaceous; older stems gray to light brown, slightly furrowed; inflorescence solitary in leaf axils; fruit conspicuously long, hairy. High forage value for livestock and game.

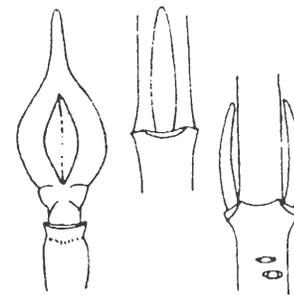
FRAXINUS PENNSYLVANICA, Green Ash. A tree of coulees and along streams in eastern Montana. Deciduous; buds opposite, sessile, somewhat kidney-shaped; bud scales valvate, dark brown, short pubescent; leaf scar raised, hemispheric, bundle traces numerous, continuous in a curving line; young stems light brown, pubescent, pith white and round; older stems brownish-green, lenticels prominent; trunk gray, furrowed; fruit 1-sided winged seeds. Grazing value unknown.

GAULTHERIA HUMIFUSA, Alpine or Creeping Wintergreen. A prostrate, creeping woody plant (scarcely shrublike) of moist or wet sites in subalpine or alpine. Evergreen; leaves alternate, small (less than 1 inch), almost round to elliptic; base round, margin entire (occasionally very faintly toothed); buds in the terminal leaf axil, very small, green; young stems narrow, light brown; older stems colored by the soil; inflorescence solitary in leaf axils; fruit red, berrylike. No known grazing value; fruit may be used by grouse and possibly rodents.

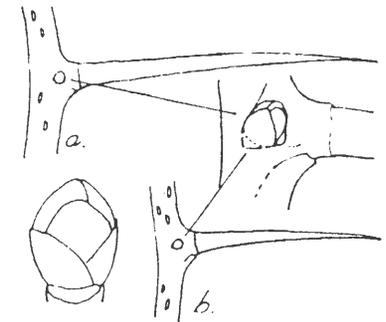
GUTIERREZIA SAROTHRAE, Broomweed, Snakeweed. Low half-shrub of grasslands on plains and dry valleys throughout the State. Deciduous; leaves occasionally persistent, linear, resinous, margin entire; leaf bases alternate, persistent; young stems, brownish to whitish, glabrous to minutely pubescent; older stems dark gray, stringy; pith brown, less than 1/5 stem diameter; inflorescence a raceme of heads, old flower stalk persistent, giving the plant a flat-topped appearance. Probably low grazing value for antelope, deer, and sheep.

HOLODISCUS DISCOLOR, Oceanspray, (*Sericotheca discolor*). A medium to tall shrub of open hillsides and rockslides, to moist woods in western Montana. Deciduous; buds alternate, sessile, triangular; 2-4 bud scales in pairs, outer scales dark red to brown, moderately gray, hairy, often absent, wine-colored inner scales appear grayish because of dense cover of white hairs; leaf scar distinct, raised, V-shaped, bundle traces 3; young stems light olive green-brown to light gray-brown, pubescent, strongly ridged, pith light brown to white, more than 1/2 stem diameter; older stems shreddy then smooth, dark reddish-brown to dark gray, pith angled, light brown, wood with prominent rays; inflorescence a panicle, persistent, drooping; fruit deciduous, old flowers persistent, small. Grazing value generally low; good summer browse for white-tailed deer.

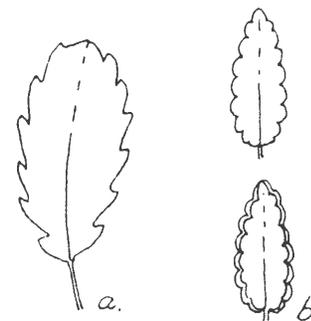
HYMENOXYYS RICHARDSONII, Pingüic, Colorado Rubberweed,



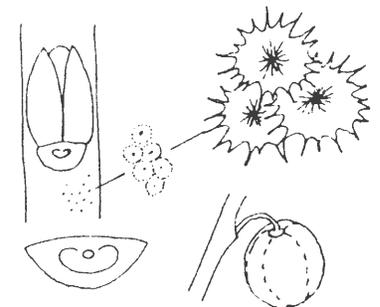
Cornus stolonifera



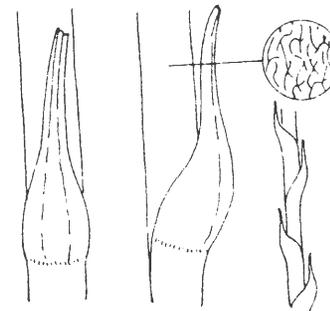
a. *Crataegus columbiana*
b. *C. douglasii*



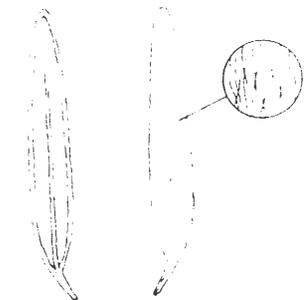
a. *Dryas drummondii*
b. *D. octopetala*



Elaeagnus commutata



Eriogonum microthecum



Eurotia lanata

(*Actinea richardsoni*). Low half-shrub of plains in eastern Montana. Deciduous; leaves, when present, divided into several segments; buds alternate, inconspicuous, naked (a cluster of short narrow undeveloped green leaves); stems brownish, glandular, mass of woolly hairs at junctions of main branches; inflorescence a flat-topped arrangement of heads; involucre disklike. Probably of some forage value to antelope; considered poisonous to sheep.

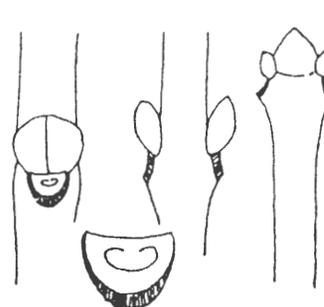
JUNIPERUS COMMUNIS, Common Juniper. A semierect to prostrate shrub of foothills, and mountains. Evergreen; leaves alternate, awl-shaped, sharp-pointed, dark green, upper surface with a white line; buds sessile in leaf axil; bud scales pointed, slender, green, glabrous; leaf scars circular, slightly raised; young stems green; older stems orange-brown and glabrous then gray and roughened; pith white, less than 1/5 stem diameter; pleasant "cedar" odor. Grazing value medium for deer; berries used by game birds.

JUNIPERUS HORIZONTALIS, Creeping Juniper. A prostrate, mat-forming shrub of the foothills and badlands or river breaks of central and eastern Montana; rooting at marginal branches and forming somewhat circular patches usually less than 1 foot high. Evergreen; leaves opposite, 4-ranked, scalelike, overlapping, narrow-pointed, glabrous with a short, indistinct gland on back; young stems green, covered with overlapping scales (leaves); fruit berrylike, blue. Grazing value for mule deer good to excellent.

JUNIPERUS SCOPULORUM, Rocky Mountain Juniper. Tall shrub or small trees of dry mountain slopes to river bottoms at scattered locations across the State. Evergreen; leaves opposite, 4-ranked, scalelike, imbricate, glabrous to often glaucous, with a distinct gland on the back, bluish to brownish-green; young stems green, covered with elongated scales; older stems purplish-gray becoming darker with age, bark splitting in rectangular checks; pith round, brown, less than 1/5 stem diameter; fruit berrylike, persistent, round, bluish, glaucous. Grazing value fair for deer and elk; fruit used by birds.

KALMIA POLIFOLIA, Swamp Laurel. A low, spreading, occasionally mat-forming shrub of bogs and other wet sites in the high mountains of the State. Evergreen; leaves opposite, elliptic, entire surface leathery, flat to rolled, lower surface paler green than the upper, confined to the upper 1/3 of the branches; leaf scars almost encircling the stem; young stems appear jointed because of encircling leaf scars, tan to light reddish-brown; older stems reddish-brown to dark brown; inflorescence solitary in leaf axil, several crowded at stem tip; fruit a 5-chambered capsule. No grazing value; poisonous to livestock.

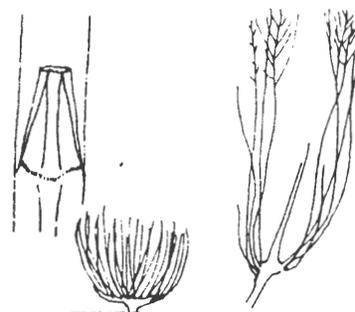
LEDUM GLANDULOSUM, Western Labrador Tea. A low to medium shrub of the coniferous forests in stream bottoms, wet, or boggy areas, at medium to high elevations in the mountainous parts of the State. Evergreen; leaves alternate, elliptic to oblong, entire lower surface whitish and covered with numerous yellow glandular dots, upper surface glabrous and green; buds very small; bud scales brown, covered



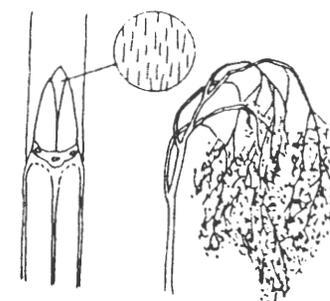
Fraxinus pennsylvanica



Gaultheria humifusa



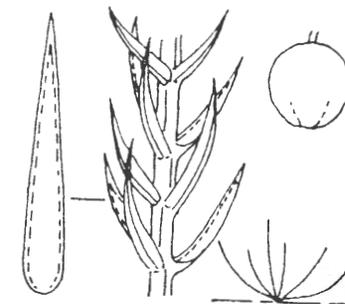
Gutierrezia sarothrae



Holodiscus discolor



Hymenoxys richardsonii



Juniperus communis

with very short, stiff, white hairs; leaf scar slightly raised, kidney- to heart-shaped; bundle trace 1; young stem greenish then brown, finely hairy, glandular-dotted; older stems gray; inflorescence a raceme, persistent, fruit a 5-chambered capsule splitting open from the bottom. No grazing value; considered poisonous to livestock, especially sheep.

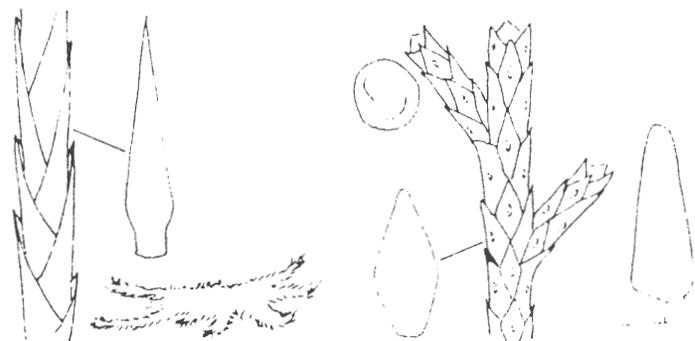
LEPTODACTYLON PUNGENS, Granite Cilia, (*Gilia pungens*). A low spiny-leaved half-shrub of dry rocky slopes in southwestern Montana. Not evergreen; leaves alternate, persistent, brown the first winter, weathered gray the second, divided into 3 or more needlelike segments with cuspidate tips; buds not evident or as a cluster of single, needlelike, immature leaves in the leaf axil; stems light brown or gray, somewhat glandular-hairy. Possibly of high grazing value on some ranges for deer and sheep.

LINNAEA BOREALIS, Twinflower. A prostrate, creeping to trailing, woody plant (scarcely shrublike) of moist and cool coniferous forests at medium to low elevations in the mountainous parts of the State. Evergreen; leaves opposite, broadly elliptic to round, base wedge-shaped, margin with 1-3 pairs of prominent to indistinct teeth (rarely entire); young stems brown, shiny; older stems dark brown, dull; inflorescence solitary, old flower stalks usually present, appear Y-shaped (one or both arms of "Y" may be absent). Grazing value low; slight summer use by white-tailed deer and bighorn sheep.

LONICERA CAERULEA, Sweetberry Honeysuckle, (*L. cauriana*). A medium shrub of stream bottoms and moist sites in the spruce-fir zone. Deciduous; buds opposite, sessile; bud scales valvate; leaf scar ragged, irregularly triangular to crescent-shaped, at end of persistent leaf base, bundle traces 3, somewhat indistinct; young stems dark reddish-brown, ascending, sparse hairy; older stems reddish, shreddy to flaky; inflorescence a pair of axillary flowers borne in the leaf axils at the base of the current year's growth; fruit a bluish or reddish, glaucous, berrylike structure of 2 apparently fused ovaries. Grazing value for livestock and big game unknown; fruit valuable for birds.

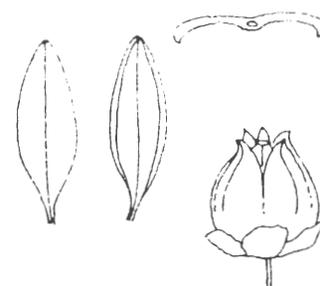
LONICERA CILIOSA, Orange Honeysuckle. A twining vine of the moist forests of northwestern Montana. Deciduous; buds opposite, small (less than $\frac{1}{8}$ inch); bud scales paired, lance-shaped, straw-brown, glaucous to glabrous; leaf scars triangular to crescent-shaped with a connecting ridge between them, bundle traces 3; young stems straw-brown to light brown, hollow; older stems fibrous to flaky, brown; pith round, white, hollow, $\frac{1}{3}$ stem diameter. Little or no grazing value.

LONICERA INVOLUCRATA, Black Twinberry. A medium shrub of bottom lands in the spruce-fir zone. Deciduous; buds opposite, sessile, pointed; bud scales paired, brown, glabrous, parchmentlike; leaf scars triangular to crescent-shaped with a connecting ridge between them, prominent, bundle traces 3, leaf stalk occasionally persistent; young stems gray-mottled, sometimes varnished, striated; older stems dark gray, shreddy; pith angled to rounded, white, solid; fruit a berry, deciduous, involucre persistent, blackened. Little grazing value for livestock; grazing value for big game unknown.

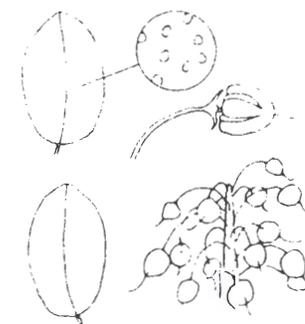


Juniperus horizontalis

J. scopulorum



Kalmia polifolia



Ledum glandulosum



Leptodactylon pungens



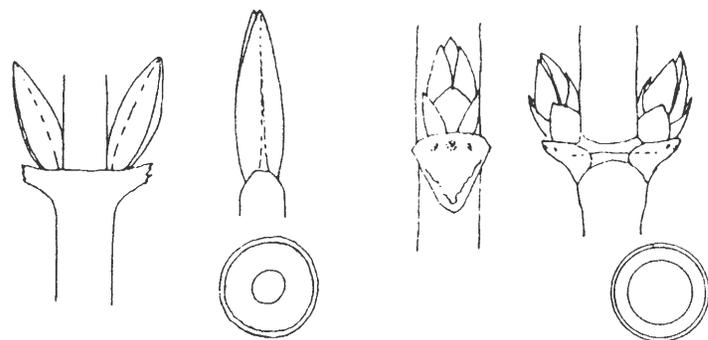
Linnaea borealis

LONICERA UTAHENSIS, Utah Honeysuckle, Red Twinberry. A low shrub of the spruce-fir and Douglas-fir zones. Deciduous; buds opposite, sessile to slightly raised, swollen or slightly inflated; bud scales paired; lower scales smaller, thin, brown; upper scales reddish-green with whitish midvein and margins; leaf scars triangular to crescent-shaped with a connecting ridge between them, bundle traces 3; young stems light to greenish brown with black glandular dots or spots; older stems dark gray, shreddy to flaky, lenticels brownish-white, small, oval, long axis horizontal; pith white, round to irregular, solid, $\frac{1}{3}$ to $\frac{1}{2}$ stem diameter. Grazing value low for livestock; heavy use by deer observed in some places.

MAHONIA REPENS, Creeping Hollygrape, Oregon Grape, (*Berberis repens*). A very low shrub of the ponderosa pine and Douglas-fir zones. Evergreen; leaves alternate, compound with 3-7 leaflets—leaflets ovate to oblong, margin spiny, tip rounded and spine-tipped, leathery, green to reddish with red veins; usually only terminal bud developed; bud scales 2, reddish, glabrous, pointed; leaf scars grayish with many bundle traces; young stems upright, short, sparsely branched, gray-brown; older stems prostrate, mostly underground, much branched, grayish-tan, bark roughened or scaly; pith yellowish-green, round, less than $\frac{1}{5}$ stem diameter; wood bright yellow-green with prominent rays; inflorescence a raceme; fruit grapelike, deciduous. Grazing value fair to good for deer. *Mahonia aquifolium* is typically taller and more erect than *M. repens* and has glossier, more acutely pointed leaves. However, these characters intergrade. *M. aquifolium* occurs sparingly in cedar forests of western Montana.

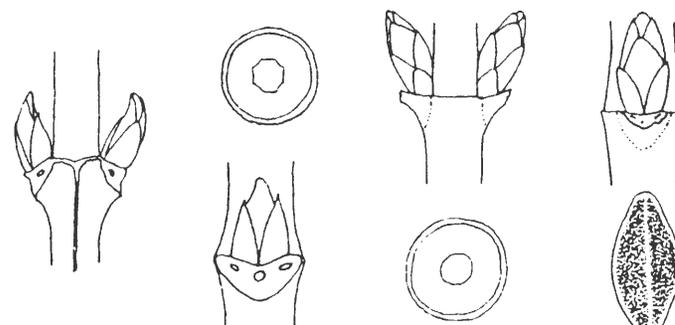
MENZIESIA FERRUGINEA, Fools Huckleberry, Rustyleaf or Smooth Menziesia, (*M. glabella*). A medium shrub of the upper Douglas-fir and lower spruce-fir zones. Deciduous; buds alternate, sessile, clustered at the stem tip; flower buds larger, elliptic to globose, terminating the larger stems; leaf buds smaller, oblong, below flower buds and terminating smaller lateral stems; bud scales imbricate, light brown, lavender-tinged, white-pubescent; leaf scar small but prominent, triangular to heart-shaped, light colored, smooth, bundle trace 1; young stems tawny, pubescent; older stems dark gray-brown, shreddy to stringy; pith darker than wood, triangular, small; inflorescence solitary in terminal clusters on previous year's wood; fruit a 4-chambered capsule, persistent. Grazing value fair for deer and elk as summer forage. Most easily confused with *Rhododendron albiflorum*.

OPLOPANAX HORRIDUM, Devils Club, (*Echinopanax horridum*). A densely spiny, medium, unbranched shrub of moist places and along streams in the cedar-hemlock zone in northwestern Montana; main stems initially decumbent then erect, 3-9 feet high. Deciduous; buds alternate, sessile, conical to rounded, bordered by spines, terminal bud large and first two lateral buds well-developed—others very small or absent; bud scales imbricate, brown to greenish-brown, papery, margin ciliate, tip rounded, scales of terminal bud persistent; leaf scar large (extending about $\frac{1}{2}$ way around stem), V-shaped to crescent-shaped, prominent (even on old stems), bundle traces 11 or 13, the lower margin of both the leaf and terminal bud scale scars bordered with a continuous



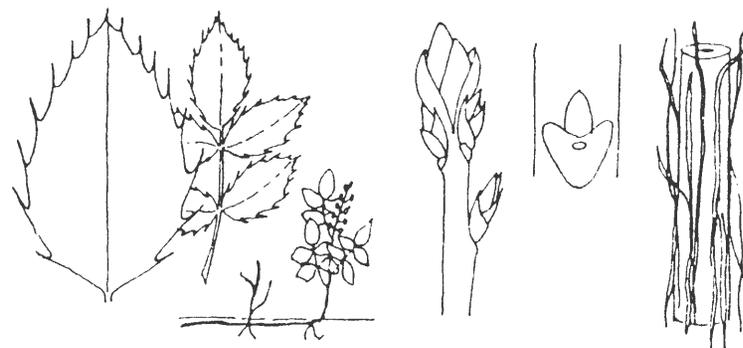
Lonicera caerulea

L. ciliosa



Lonicera involucrata

L. utahensis



Mahonia repens

Menziesia ferruginea

row of yellowish spines; young stems light grayish, spiny, scattered hairs passing into fine spines; pith white, round, greater than $\frac{3}{4}$ stem diameter; older stems brownish-gray, spiny, lenticels brown, round to oblong, wood cream white to light brown, ring porous; inner bark highly resinous, pungent odor; inflorescence a panicle, the base long persistent; fruit an attractive 2-3 seeded bright red berry. No grazing value; fruit may be of value to birds.

PACHISTIMA MYRSINITES, Mountain Lover, Myrtle Pachistima. A common, low, semierect shrub of moist coniferous forests. Evergreen; leaves opposite, elliptic to reverse lance-shaped, margin-toothed, tip rounded, glabrous, leathery; buds very small, flower buds stalked, leaf buds sessile; bud scales paired, green to pinkish, glabrous; leaf scar small, triangular to hemispherical, bundle trace 1; young stem purplish-gray to brown, slightly angled, glabrous; older stems brownish to gray-brown, smooth; pith tawny, less than $\frac{1}{2}$ stem diameter; wood white. Grazing value fair to good for big game.

PARTHENOCISSUS QUINQUEFOLIA, Virginia Creeper. A vine on trees and shrubs in valley bottoms and thickets in the eastern part of the State. Deciduous; buds alternate, sessile, small; bud scales imbricate, brown, glabrous; leaf scar hemispheric, prominent, strongly raised, whitish, bundle traces 8; young stem brown, slightly pubescent, lenticel white, elongated, conspicuous, tendrils with adhesive disk; pith white, $\frac{1}{2}$ stem diameter; older stems gray, furrowed; inflorescence a panicle; fruit a blue 1-3 seeded berry. No grazing value to livestock or game; probably of value to birds.

PENSTEMON FRUTICOSUS, Shrubby Penstemon. A low shrub of open coniferous woods and rock outcroppings at medium to high elevations in the mountainous parts of the State. Evergreen; leaves opposite, oblong (large ones) to lance-shaped (smaller), crowding the end of the stem, margin entire to irregular and shallow-toothed; leaf bases irregularly broken, persistent, opposite pairs continuous, giving the stem a jointed appearance; young stems light brown; older stems grayish and shallowly furrowed; inflorescence a raceme, persistent; fruit a 2-chambered seed pod. Grazing value for livestock unknown; heavy use reported for deer in one locality.

PHILADELPHUS LEWISII, Mockorange, Syringa. Tall shrubs of rocky hillsides and flats in the Douglas-fir zone. Deciduous; buds opposite, hidden beneath the leaf scar; leaf scar triangular to heart-shaped, often cracked or split revealing the bud inside; bundle traces 3; young stems reddish-brown to chestnut-brown, glabrous except near terminal bud scale scars; older stems gray to red-brown with conspicuous checks or cross cracks, pith white, round, greater than $\frac{1}{2}$ stem diameter. Inflorescence axillary to a raceme; fruit a 4-chambered seed pod, persistent. Grazing value none, or low for livestock; variously reported for big game from unpalatable to highly palatable.

PHYLLODOCE EMPETRIFORMIS, Red Mountainheath. A low mat-forming shrub of subalpine forests and alpine zones in the high

mountain zones of the State. Evergreen; leaves alternate, fir-needlelike with a distinct medial furrow on the upper surface, dark green, margin very tightly rolled or folded leaving only the glabrous midvein of the lower surface visible; leaf scar small, raised (giving the stem a pegged appearance); young stems variously brown; older stems gray, exfoliating to show light brown; inflorescence solitary in leaf axils, clustered at the stem tips; fruit a 5-chambered seed pod, occasionally persistent. No grazing value for livestock; reported mildly poisonous to sheep; probably no grazing value for big game. Flowers used by ptarmigan.

PHYLLODOCE GLANDULIFLORA, Yellow Mountainheath. Similar in most respects to *P. empetriformis*, differing from it chiefly by its leaves. Leaves yellowish-green, upper surface concave, smooth (without medial furrow), linear but shorter and broader in proportions than those of *P. empetriformis*, midvein on lower surface often appearing as a white line. Scarce, not as common as *P. empetriformis*; at scattered locations throughout the high mountains of the State. Hybrids have been found where both *P. empetriformis* and *P. glanduliflora* occur together; these plants exhibit characteristics intermediate between the two.

PHYSOCARPUS MALVACEUS, Ninebark, (*Opulaster malvaceus*). Low to medium shrubs of rocky hillsides of Douglas-fir zone. Deciduous; buds alternate, sessile; bud scales imbricate, pale gray to brownish, pubescent, thin, somewhat papery, and easily broken; leaf scars semi-circular to crescent-shaped, raised, bundle traces 3; stipules continuous with leaf base (scar) thin, papery, tips usually broken, ragged base persistent; young stems orange-brown with very small stellate (starlike) hairs, ridged; older stems gray, shreddy, exfoliating, revealing light-colored innerbark, pith tan, $\frac{1}{3}$ to $\frac{1}{2}$ stem diameter; inflorescence a corymb, old flowers persistent in flat-topped clusters. Grazing value low to none for livestock and game.

POPULUS, Poplars and Cottonwoods. A genus with apparently actively hybridizing species. The species are very difficult to identify even in full foliage. Winter characteristics of some species are imperfectly known, and the treatment given here is considered tentative; specific identifications should be viewed with caution.

POPULUS ACUMINATA,* Lanceleaf Cottonwood.

POPULUS ANGUSTIFOLIA, Narrowleaf Cottonwood.

POPULUS BALSAMIFERA, Balsam Poplar, (*P. tacamahaca*). These species have no distinguishing winter field characteristics other than those approximations given in the key. All are tall trees of river bottoms, other watercourses, and depressions or other sites with good subsurface moisture in Montana east of the Continental Divide. Deciduous; buds alternate, relatively large; bud scales imbricate, pointed, gummy, or resinous; leaf scars large, distinct, bundle traces 3; stems variously grayish to brownish. Grazing value of sprouts and small plants moderate to low for livestock and big game. Heavy use made by

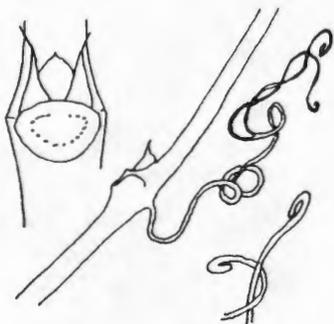
*Considered by some as a hybrid between *P. angustifolia* and *P. sargentii*.



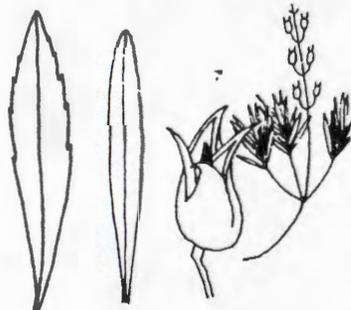
Oplopanax horridum



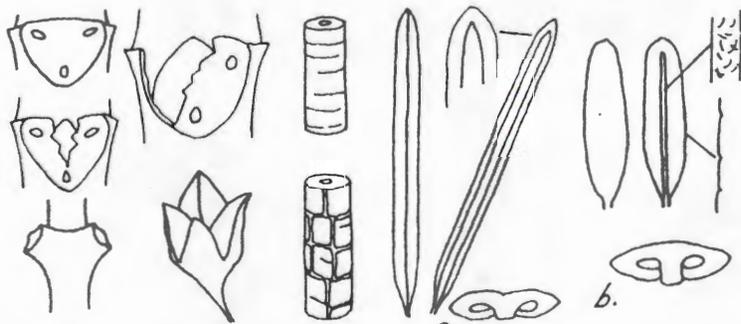
Pachistima myrsinites



Parthenocissus quinquefolia



Penstemon fruticosus



Philadelphus lewisii

a. *Phyllodoce empetriformis*
b. *P. glanduliflora*

horses and big game under limited or critical browse conditions; bark on young trees may be taken in spring, even when other feed is available.

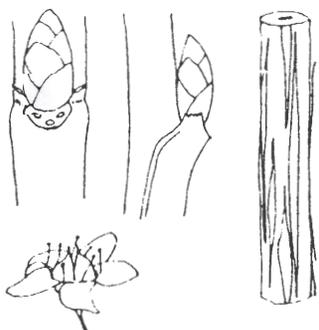
POPULUS SARGENTII, Plains Cottonwood. A large tree of river bottoms in eastern Montana. Deciduous; buds alternate, relatively small (less than 1/2 inch long), yellow resinous; bud scales imbricate, few (3-4), pointed, glabrous to slightly pubescent; leaf scar triangular to semicircular, smooth, bundle traces 3; young stems straw yellow to gray, lenticels white, narrow, pith brown, 1/2 or less stem diameter, sprouts or suckers strongly ridged. Grazing value low for livestock and big game but some use expected on young trees.

POPULUS TREMULOIDES, Quaking Aspen. A small, slender tree, widespread throughout State on sites with adequate moisture from the sagebrush to the spruce-fir types. Deciduous; buds alternate, sessile, small, nonresinous, flower buds rounded, plump, leaf buds conical, slender; bud scales imbricate, brown, shiny; leaf scars semicircular to somewhat triangular, bundle traces 3; stipule scars present; young stems brownish; older stems whitish, lenticels reddish, round to elliptic, pith angled. Grazing value relatively low for livestock and game; preference lower than for more common shrub species.

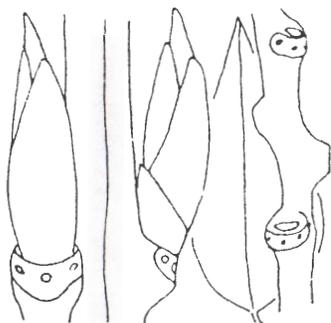
^{balbaniifera}
~~**POPULUS TRICHOCARPA**~~, Black Cottonwood. A tall tree of valley bottoms and probably the most common cottonwood in western Montana; pioneers readily along roads, borrow pits, mine tailings, and other disturbed areas in its habitat. Deciduous; buds alternate, sessile, over 1/2 inch long; slender, red resinous, aromatic; bud scales imbricate, few (3-4), glabrous; leaf scars triangular to crescent-shaped, smooth, bundle traces 3; young stems brownish-green, shiny, angular on sucker sprouts, lenticels white, narrow, conspicuous; pith light brown, about 1/2 stem diameter. Grazing value fair to low for livestock and game.

^{Pentaphylloides floribunda (Pursh) Love}
~~**POTENTILLA FRUTICOSA**~~, Shrubby Cinquefoil, (*Dasiphora fruticosa*). A low shrub of moist sites from prairies to subalpine, widespread throughout the State. Deciduous; buds alternate, completely hidden behind persistent leaf bases; leaf base brown, somewhat papery, sheathing the stem, prominently 3-nerved, these coalescing at the leaf scar; leaf scar round, steplike, below the junction of the inner stipule margins, bundle trace 1; stipules membranous, 1-veined, continuous with and slightly longer than the leaf base, ciliate margined; young stems orange-brown, hairy; older stems gray, fibrous to shreddy exfoliating, revealing orange inner bark; pith brown, less than 1/2 stem diameter; inflorescence solitary or few flowered cymes, old flowers occasionally persistent; fruit seedlike, small, hairy. Grazing value low for livestock and big game.

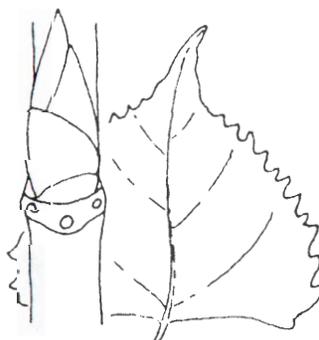
PRUNUS AMERICANA, Wild Plum. A tall shrub to small tree in thickets along stream bottoms and coulees mainly in eastern Montana. Deciduous; buds alternate, sessile, pointed, small (less than 1/4 inch), auxiliary buds may be present; bud scales imbricate, pointed to mucro-



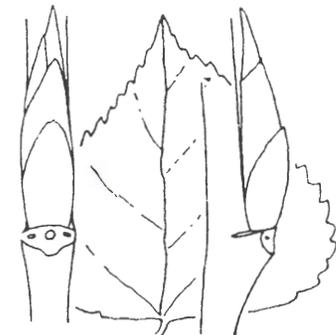
Physocarpus malvaceus



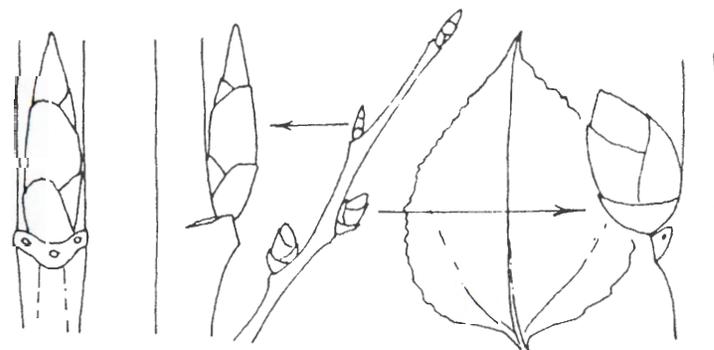
Populus angustifolia



Populus sargentii



P. trichocarpa



Populus tremuloïdes

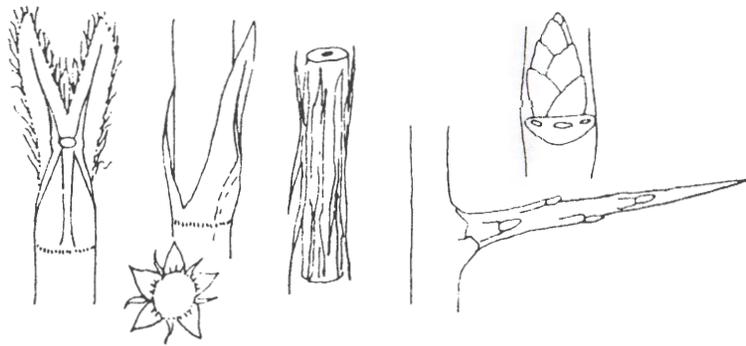
nate, dark brown, pubescent, ciliate; leaf scar triangular to crescent-shaped, slightly raised, distinct. bundle traces 3; stipule scars present but inconspicuous; young stem light brown, varnished red to greenish-brown, densely pubescent near base, lenticels brown, pith brown, large, angular; older stems gray-brown to purplish-gray, smooth to sometimes shaggy, lenticels white, conspicuous, pith brown, round, less than 1/5 stem diameter; armed branchlets, short pointed stems with one to several very small buds; fruit plumlike with a flat pit, orange to red. Grazing value fair for deer; fruit used by birds.

PRUNUS EMARGINATA, Bitter Cherry. Medium to tall shrubs of slopes in the Douglas-fir and cedar-hemlock zones in western Montana; most common in burns. Deciduous; buds alternate, sessile, pointed, small (1/8 inch) divergent from the stem; bud scales imbricate, pointed, reddish-brown; leaf scar inconspicuous, semicircular, bundle traces 3; stipule scars present but inconspicuous; young stem reddish, glabrous to minutely pubescent at tips, lenticels gray, prominent; older stems reddish to purplish-gray, bark peeling in thin flakes; pith tan to brown, round, less than 1/4 stem diameter; taste and odor of bitter-almonds; inflorescence corymbose; fruit bright red (dark red when dry). Grazing value low to none for big game.

PRUNUS PENNSYLVANICA, Pin Cherry. A medium shrub to small tree of various valley habitats, chiefly east of the Continental Divide in Montana. Deciduous; buds alternate, slender; bud scales imbricate, brown throughout; leaf scars semicircular to crescent-shaped, bundle traces 3; young stem reddish-brown, shiny, lenticels reddish to orange; older stems red brown often grayish mottled, lenticels orange; pith brownish; inflorescence corymbose; fruit red. Grazing value believed to be similar to that of *P. virginiana*.

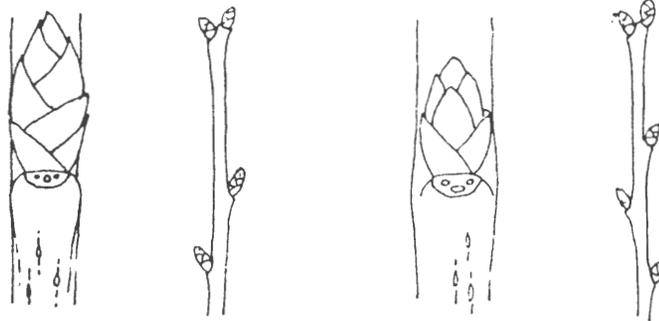
PRUNUS VIRGINIANA, Chokecherry, (*P. demissa*, *P. melanocarpa*). Medium shrubs to small trees along watercourses and on hillsides in grasslands and the ponderosa pine to lower (drier) Douglas-fir zones. Deciduous; buds alternate, sessile, pointed, large (1/4 inch); bud scales imbricate, pointed, 2-toned; basal portion dark brown, terminal portion lighter brown and somewhat membranous; leaf scar hemispherical, raised, bundle traces 3; young stem dark reddish-brown, glabrous, lenticels whitish, conspicuous, vertically elongated; older stems gray-brown, lenticels elongated laterally; pith white to tan, round, less than 1/2 stem diameter; taste and odor of bitter-almonds; inflorescence a raceme on second-year stems, old flower stalks semipersistent; fruit dark red to black. Grazing value high for big game; low for livestock; poisonous if taken in large quantities. Fruit valuable for birds.

PURSHIA TRIDENTATA, Bitterbrush. Medium rigidly branched shrub of foothills and dry rocky slopes in grassland and ponderosa pine zones. Deciduous to semideciduous; buds alternate, without bud scales, short lateral spurs formed by fasciculate, persistent leaf bases and stipules which function as bud scales; leaves wedge-shaped, 3-lobed or toothed, margin narrowly rolled, upper surface green, slightly pubescent to sparsely woolly, usually glandular, lower surface whitish with dense



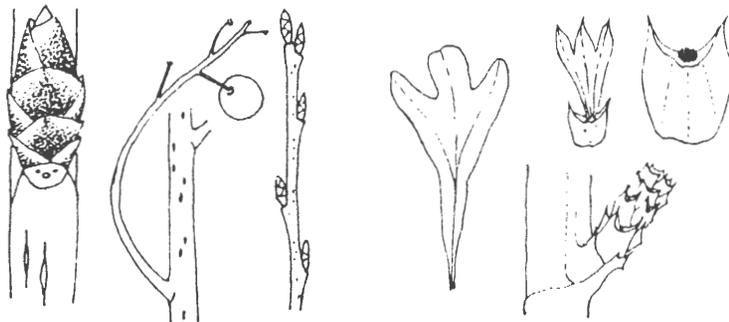
Potentilla fruticosa

Prunus americana



Prunus emarginata

P. pensylvanica



Prunus virginiana

Purshia tridentata

woolly hairs; leaf base persistent, brown, stipules sharp-pointed, rigid, continuous with the base; leaf scar between the stipules at the leaf base summit, small, circular, bundle trace 1; young stem reddish to light brown, not produced on some plants every year; older stems gray, outer bark flaking off in irregular patches; pith brown, small; inflorescence solitary at spur summit; fruit a spindle-shaped achene with persistent sepals, usually deciduous. Grazing value rated very high for big game and livestock, but appears to be less palatable than associated shrubs in some sites in northwestern Montana.

QUERCUS MACROCARPA, Bur Oak. Small tree in southeastern Montana. Deciduous; buds alternate, sessile, plump, pointed; bud scales imbricate, tawny brown, pubescent, leaf scar hemispherical, raised, bundle traces several arranged in a crescent or triangular pattern; stipule scar present, stipules occasionally persistent; young stem light tan to brown, sparingly pubescent, lenticels inconspicuous, raised; pith white, star-shaped, large; older stems gray-brown, lenticels brown, raised, pith tan, star-shaped, smaller. Fruit an acorn with a frilled cup. Grazing value good for big game; most important for turkeys.

RHAMNUS ALNIFOLIA, Alderleaf Buckthorn. A medium size shrub of wet areas along streams and valley bottoms in the ponderosa pine and Douglas-fir zones. Deciduous; buds alternate, sessile; bud scales imbricate, brown, often with a fine line across the back, that portion above this line thin and translucent, margin erose to mucronate and pubescent to ciliate; leaf scar hemispherical, raised, bundle traces 3 to several in a crescent pattern; stipule scar dark, inconspicuous; young stem dark reddish-brown, smooth with gray bloom; older stems purplish-gray, somewhat rough; pith off-white, irregular, small; acid odor and taste; inflorescence umbrellalike; fruit bluish-black, 3-seeded berry. Grazing value low or none for livestock or big game.

RHAMNUS PURSHIANA, Cascara Buckthorn. A medium shrub of openings in moist coniferous forests in valleys of western Montana; infrequent. Deciduous; buds alternate, naked, composed of several small grayish-brown, densely pubescent, prominently veined rudimentary leaves; leaf scar oval to kidney-shaped, slightly raised, bundle scars 3; young stem purplish to gray, moderately pubescent, wood greenish; older stems gray, smooth, lenticels light gray, circular to slightly elongated; pith angular to round, light tan; wood white, ring porous with very fine rays; inflorescence umbrellalike; fruit a purplish-black berry. Very palatable to big game; fruit valuable for birds.

RHODODENDRON ALBIFLORUM, White Rhododendron. A medium shrub of moist coniferous forests and openings in the high mountains of western Montana. Deciduous; buds alternate, sessile, clustered at the stem tip; bud scales imbricate, sparsely covered with coarse red hairs; leaf scar small but prominent, triangular to heart-shaped, light-colored, smooth, bundle trace 1; young stem light to dark cinnamon-brown, shiny, sparsely covered with coarse red (or black) hairs; older stems silvery to gray, smooth to shreddy; pith round, light brown; wood white; inflorescence solitary in axillary clusters on current year's wood; fruit a semipersistent 5-chambered capsule with persistent sepals. No

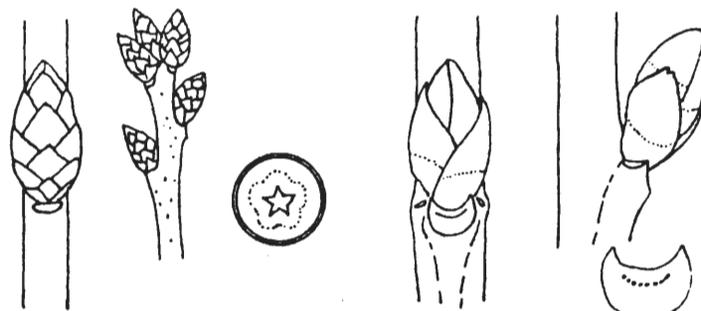
grazing value for livestock and possibly none for big game; reported poisonous to sheep. This shrub is most easily confused with *Menziesia ferruginea*, but readily distinguished from it by its coarse red hairs and distinctive fruit.

RHUS GLABRA, Smooth Sumac. Small to medium shrub of open southerly exposures in the ponderosa pine zone and on rocky soils of adjacent grasslands. Deciduous; buds alternate, rounded, appear partially sunken in leaf scar; bud scales indistinct, light to dark brown, dense, felty; leaf scar horseshoe-shaped, nearly to completely encircling the bud, prominent, raised, bundle traces 7 or more; young stem brown to reddish-brown, glabrous, lenticels brown, circular, small; pith off-white, round, more than $\frac{1}{2}$ stem diameter; older stems dark brown, smooth to rough; inflorescence a terminal compound panicle; fruit berrylike, red, felty. Grazing value good for deer; fruit of value to birds.

RHUS RADICANS, Poison Ivy, (*R. toxicodendron*, *Toxicodendron radicans*). Low, single-stemmed shrub of sunny to shady, somewhat moist sites on hillsides and valleys at lower elevations throughout the State. Deciduous; buds alternate, naked, apparent terminal bud larger, well developed, conspicuous, lateral buds smaller and less conspicuous; rudimentary bud leaves paired, lobed, hairy; leaf scar triangular, bundle traces 5; young stems light brown; older stems gray-brown, lenticels dark, warty appearing; inflorescence a panicle in leaf scar axils; fruit berrylike, white, ribbed, shiny. Grazing value reported low for livestock. Plant contains a resinous substance often poisonous to touch for humans.

RHUS TRILOBATA, Skunkbrush. A medium, somewhat spreading and unpleasantly aromatic shrub of open rocky slopes in foothills of central and eastern Montana. Deciduous; buds alternate; staminate flower buds catkinlike, 1-3 at a node, prominent; pistillate flower and leaf buds hidden behind persistent leafstalk bases; flower bud scales imbricate, minute, brown or tan, glandular, hairy; leaf scar at tip of leafstalk base, round, bundle traces 5-8 in a circle, obscure; young stems brown, densely pubescent, lenticels light brown, round, splitting vertically, scattered; pith white, more than $\frac{3}{4}$ stem diameter; older stems gray-brown with bloom to darker, smooth, lenticels rusty brown, round, pith brown, less than $\frac{1}{2}$ stem diameter; inflorescence an axillary raceme; fruit berrylike, red, sticky-hairy. Grazing value fair for big game; heavily used when browse supply of other species is limited.

RIBES AMERICANUM, American Black Currant. Medium shrub of draws and watercourses of the plains of eastern Montana. Deciduous; buds alternate, sessile, small, rounded; bud scales imbricate, mucronate, outer scales light tan, scarios, inner scales reddish at base, lightly pubescent with golden brown glandular dots; leaf scars V-shaped, prominent, tan; bundle traces 3; young stem grayish, pubescent and prominently glandular near tip, strongly ridged; older stems gray with remnants of ridges; pith white, large, porous, less than $\frac{1}{2}$ stem diameter; inflorescence an axillary raceme; fruit a black currant. Grazing value low for livestock and big game; fruit valuable for birds.



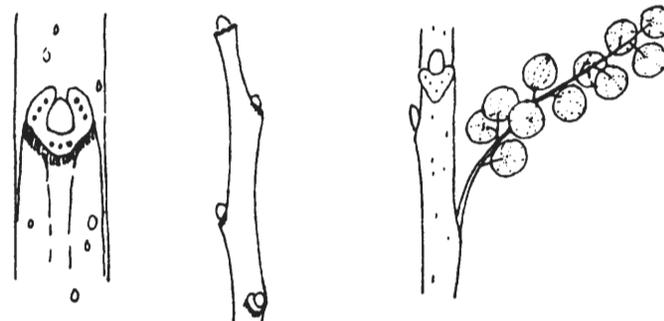
Quercus macrocarpa

Rhamnus alnifolia



Rhamnus purshiana

Rhododendron albiflorum



Rhus glabra

R. radicans

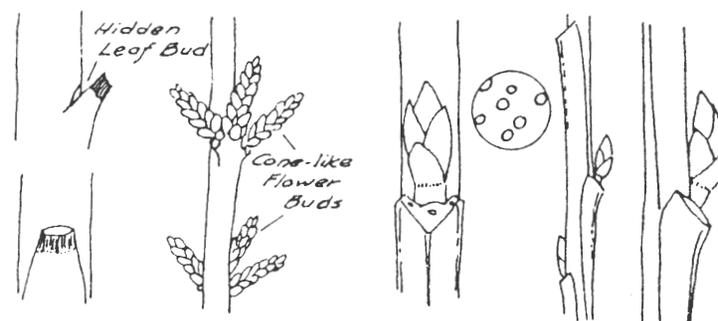
RIBES AUREUM, Golden Currant. Medium shrub of foothills and plains along draws and watercourses. Deciduous; buds alternate, sessile, small; bud scales imbricate; leaf scar narrow curved; bundle traces 3; young stem yellowish to reddish-tan, shiny, glabrous to finely pubescent; older stems darker, grayish; inflorescence an axillary raceme, fruiting stalk persistent; fruit a yellow (red to black) berry, deciduous. Grazing value low for livestock and big game; fruit valuable for birds.

RIBES CEREUM, Wax or Squaw Currant. Medium, intricately branched shrub of grasslands and open forests, extending from the lower elevations in the mountains to the foothills and plains; widespread in Montana. Deciduous; buds alternate sessile, plump; bud scales imbricate, reddish-brown, resinous, mucronate, somewhat membranous; leaf scars narrow crescent-shaped, bundle traces 3; young stems orange-brown, glandular with circular to irregularly shaped, resinous transparent-to-whitish dots, finely pubescent to essentially glabrous; older stems grayish to brownish; pith white, less than $\frac{1}{4}$ stem diameter; inflorescence raceme from spur shoots, few flowered; fruit a red-to-orange berry. Grazing value low for livestock and big game; fruit valuable for birds.

RIBES HUDSONIANUM, Hudson Bay Currant, (*R. petiolare*). Medium, sparingly branched, erect-stemmed shrub of mountain streams and springs. Deciduous; buds alternate, sessile or short-stalked, large; bud scales imbricate, gray-brown, mucronate, glandular with small, circular yellow, resinous dots, ciliate margin; leaf scar large, extending more than halfway around the stem, crescent-shaped, bundle traces 3; young stems light grayish-green blotched with brown, glandular with scattered, small, yellow, resinous dots; older stems reddish-brown, outer bark gray, shreddy, lenticels brown; pith white, about $\frac{1}{4}$ stem diameter; inflorescence a raceme; fruit a bitter black berry. Grazing value low for big game; fruit valuable for birds.

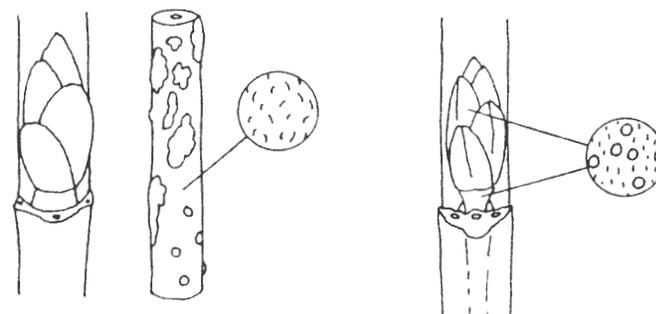
RIBES INERME, Whitestem Gooseberry. Medium, weakly armed to unarmed shrub of streambanks and moist mountain slopes of western Montana. Deciduous; buds alternate, sessile or short-stalked, slender with side toward stem often flattened; bud scales imbricate, thin, light brown, mucronate tip; leaf scar crescent-shaped, bundle traces 3; young stems white to light grayish, glabrous or sparsely pubescent; older stems grayish, flaky then reddish-brown, inner bark showing, glabrous; pith white, round, less than $\frac{1}{3}$ stem diameter; stems slender, unarmed to irregularly armed with a single (rarely 3), small, weak nodal spine, internodal spines absent; inflorescence a 2-4-flowered raceme; fruit a smooth, reddish-purple berry. Grazing value low to none for livestock and big game; fruit valuable for birds.

RIBES IRRIGUUM, Idaho Gooseberry. A weakly armed, medium shrub of rather moist sites in valleys to coniferous forests west of the Continental Divide. Deciduous; buds alternate, stalked, slender, pointed, divergent from the stem; bud scales imbricate, grayish-brownish, pubescent-margined, mucronate; leaf scars narrow, crescent-shaped, bundle traces 3; young stems grayish-brown, densely, finely pubescent; older



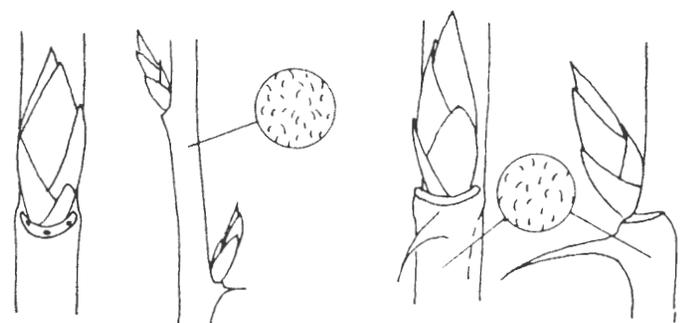
Rhus trilobata

Ribes americanum



Ribes cereum

R. hudsonianum



Ribes inerme

R. irriguum

stems grayish to reddish-brown, smooth; pith off-white, spongy, less than $\frac{1}{5}$ stem diameter; armed with moderately rigid spines, nodal spine 1 (less commonly 2-3), internodal spines scarce to numerous, smaller than nodal spines; inflorescence a 2-3-flowered raceme; fruit a bluish-purple berry. Grazing value low for livestock or big game.

RIBES LACUSTRE, Prickly Currant. A spiny, medium shrub of moist forests, streamsides, and bottom lands in the western half of the State. Deciduous; buds alternate, sessile, round-tipped, terminal bud conical; bud scales imbricate, light brown, mucronate, margins long-ciliate, scarious; leaf scars narrow, crescent- to V-shaped, bundle traces 3; young stems straw-colored to orange-brown, dense short pubescent; older stems gray-brown to red-brown; pith white, round, spongy, less than $\frac{1}{4}$ stem diameter; armed with rigid, brown spines, nodal spines 3-9, internodal spines numerous; inflorescence a raceme; fruit a dark purple berry covered with purple-tipped glandular hairs. Grazing value low for livestock or game.

RIBES MONTIGENUM, Alpine Prickly Currant. A low, spiny, intricately branched shrub of subalpine and alpine. Deciduous; buds alternate, sessile, pointed, small; bud scales imbricate, mucronate; leaf scar narrow, crescent-shaped, slightly raised, bundle traces 3; young stems light tan, glabrous; older stems grayish; pith light tan, less than $\frac{1}{2}$ stem diameter; armed with stout spines, nodal spines 3-5, internodal spines variable in size, numerous; inflorescence a few-flowered raceme; fruit, a reddish berry. Grazing value low for livestock or game.

RIBES SETOSUM, Redshoot Gooseberry. A spiny, medium shrub with arched or recurving branches; of streamsides, valleys, and hillsides; widespread in Montana. Deciduous; buds alternate, sessile, slender, pointed; bud scales imbricate, pale tan, mucronate, scarious, margin erose to ciliate; leaf scar crescent-shaped, bundle traces 3; young stems bright orange-brown to yellowish-brown; slightly pubescent; older stem light gray to whitish, somewhat shreddy; pith round, white; armed with orangish spines, nodal spines very stout, 3 (occasionally with 1 or 2 additional smaller spines), internodal spines few, weak; inflorescence a few-flowered raceme; fruit a deep purplish-black berry. Grazing value low.

RIBES VISCOSISSIMUM, Sticky Currant. Medium shrub of moist sites in coniferous forests of western Montana. Deciduous; buds alternate, stalked, pointed, large ($\frac{1}{4}$ -inch long); bud scales mucronate, inner scales reddish, somewhat herbaceous, outer scales brown, somewhat scarious; leaf scar narrow, crescent-shaped, bundle traces 3; young stems stiff, erect, gray-brown, glandular pubescent; older stems gray to reddish-brown, smooth, bark shredding in thin, continuous sheets, lenticels horizontally elongated; pith white, less than $\frac{1}{5}$ stem diameter; inflorescence a many-flowered raceme; fruit a deep bluish-black berry. Grazing value low.

ROSA ACICULARIS, Prickly Rose. Prickly, medium shrub of coniferous forests; common in western Montana. Deciduous; buds alternate, sessile, quite small; bud scales imbricate, reddish, glabrous,

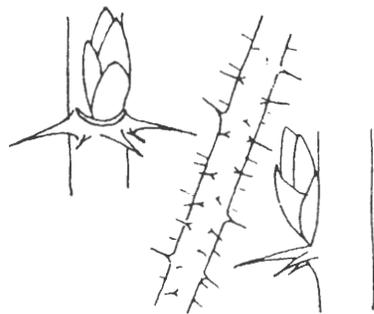
shiny; leaf scars very narrow; young stems red, glabrous; older stems reddish-brown; armed with numerous various-sized, yellowish spines (or prickles) which arise from a shieldlike base; infrastipular spines (those arising below the stipules or just below the leaf scar) similar to the internodal spines, internodal spines numerous; inflorescence solitary on last season's wood; fruit a purplish hip, sepals persistent. Grazing value fair for cattle and deer.

ROSA ARKANSANA, Prairie Rose. An armed, simply branched, low, rhizomatous, half-shrub in grassland of foothills and plains of eastern Montana. Deciduous; buds alternate, sessile, pointed; bud scales imbricate, glabrous; young stems reddish, glabrous to glaucous; older stems grayish-red; stems dying back to near the ground, stems persistent and more shrubby in protected sites; spines with a shieldlike base, infrastipular spines similar to the internodal spines, internodal spines weak, deciduous, abundant to occasionally sparse; inflorescence a several-flowered terminal cyme on the main shoots of the current season's growth; fruit a purplish hip. Grazing value fair for livestock and deer in late summer and fall; declining to none in winter.

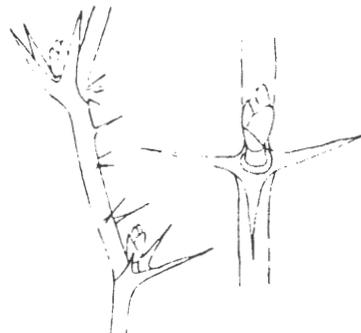
ROSA GYMNOCARPA, Baldhip Rose. Medium, slender, lax, armed shrub of shady woods west of the Continental Divide. Deciduous; buds alternate, sessile; bud scales greenish with red backs; leaf scars narrow, encircling more than $\frac{1}{2}$ the stem; young stems bright green, glaucous; older stems brown or purplish; pith cream-colored, round, $\frac{1}{2}$ stem diameter; spines straight to slightly recurved with shieldlike base; infrastipular spines similar to internodal spines and usually present, internodal spines abundant to nearly absent; inflorescence solitary; fruit a persistent red to red-orange hip with deciduous sepals. Grazing value fair for cattle and deer.

ROSA NUTKANA, Nootka Rose, (*R. spaldingii*). Medium-armed shrub of streamsides and forested slopes of western Montana. Deciduous; buds alternate, sessile; bud scales imbricate, glabrous; leaf scar narrow, crescent-shaped, bundle traces 3; young stems reddish to brownish, glabrous; older stems grayish; armed with yellowish spines with a shieldlike base, infrastipular spines (those arising just below the leaf scar) usually 2, larger and distinct from the internodal spines, internodal spines few or absent; inflorescence solitary or sometimes 2-3-flowered; fruit a purplish hip with persistent sepals. Grazing value fair for livestock and deer.

ROSA WOODSII, Woods Rose, (*R. fendleri*, *R. ultramontana*). An armed (but not prickly) medium shrub of foothills, plains, and lower elevations in the mountains. Deciduous; buds alternate, sessile, small; bud scales valvate, dark red, shiny; leaf scars very narrow, inconspicuous, bundle scars 3; young stems dark red, glaucous, smooth; older stems purplish-gray often with dark blotching; pith white, round, $\frac{1}{4}$ to $\frac{1}{3}$ stem diameter; spines with shieldlike base, infrastipular spines stouter than internodal spines, generally present, usually 2; internodal spines generally sparse or absent; inflorescence a few-flowered cyme; fruit a red hip with persistent sepals. Grazing value fair for cattle and deer.



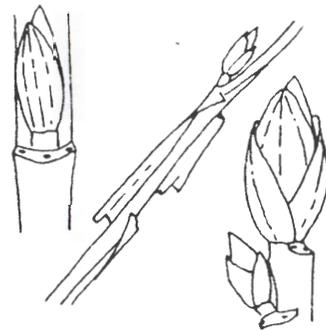
Ribes lacustre



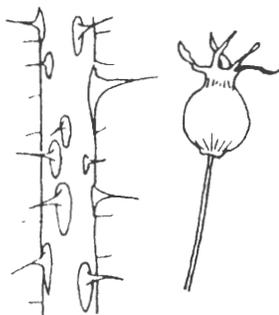
R. montigenum



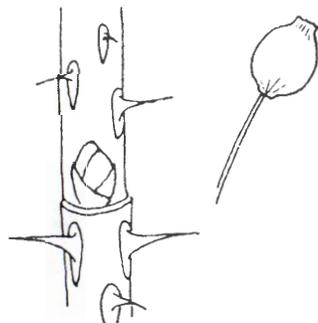
Ribes setosum



R. viscosissimum



Rosa acicularis



R. gymnocarpa

RUBUS IDAEUS, Red Raspberry, (*R. strigosus*). Small, weakly armed, somewhat rambling shrubs of rock slides and open to partially shaded slopes in the Douglas-fir and spruce-fir zones. Deciduous; buds alternate, sessile in cupping leaf base, basal or lateral auxiliary buds may be present; bud scales imbricate, dark brown, glabrous (terminal ones dense, pubescent); leaf base often persistent, varnished cinnamon-brown, and obscuring the leaf scar; leaf scar raised semicircular to crescent-shaped, bundle traces 3; stipules semipersistent, narrow, membranous, easily broken; young stems cinnamon-brown, glabrous, smooth, varnished; older stems brown to grayish, shreddy, pith tan, large (stems short-lived, leafing the first year, fruiting and dying the second year); spines without shieldlike base, weak straight, abundant to sparse; inflorescence axillary raceme, occasionally persistent; fruit red, deciduous. Grazing value low for livestock and big game; valuable for other wildlife.

RUBUS PARVIFLORUS, Thimbleberry. Low shrubs of open to moist locations in coniferous forests of Montana. Deciduous; buds alternate, sessile, moderately large, loose-scaled; bud scales imbricate, thin, outer brown, inner white, very hairy; leaf base persistent, large, brown, dull; bundle traces 3, indistinct or occasionally absent; young stems light brown, glandular pubescent; pith brown, more than $\frac{1}{2}$ stem diameter; older stem gray-brown, shreddy or flaky; inflorescence a raceme, old flowers occasionally persistent with large sepals and receptacle; fruit raspberry-like, red, deciduous. Grazing value low for livestock and big game; fruit valuable for forest wildlife.

SALIX spp., Willows. This is an extremely difficult group to identify to species. Easily keyed to genus on the basis of single bud scale. Low to tall shrubs of a wide variety of sites from alpine meadows and upland slopes to valley bottoms and streambanks, widely distributed throughout the State. Deciduous; buds alternate, flower buds plump or larger; bud scale 1, the edges meeting behind the bud on the face next to the stem, variously colored; leaf scars generally narrow, crescent-shaped, bundle traces 3; stems variously colored, ranging from yellow or red to gray or green, glabrous or glaucous to pubescent, angled to round; pith off-white, less than $\frac{1}{2}$ stem diameter. Grazing value very high for wildlife. Scattered stands on upland sites heavily used by deer and elk. Valley-bottom stands important for moose within its range and heavily used by livestock in late summer, particularly in heavily stocked pastures. Buds are important to some species of upland game birds.

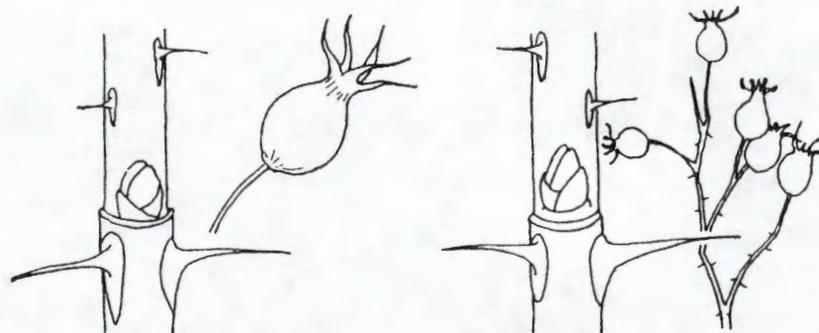
SAMBUCUS CERULEA, Blue Elderberry. A tall, many-stemmed shrub of streams, roadsides, and openings in the ponderosa pine and Douglas-fir zones. Deciduous; buds opposite, large; auxiliary buds when present immediately below the main bud; bud scales paired, brownish, somewhat thin; leaf scars large, broad V- or crescent-shaped, bundle traces 5 or 7, very distinct; young stems brown, glossy, glabrous to glaucous, pith white, more than $\frac{3}{4}$ stem diameter; older stems gray, furrowed; pith tan; inflorescence flat-topped; fruit berrylike, blue, glaucous. Grazing value fair for big game; heavily browsed on occasion.

SAMBUCUS RACEMOSA, Black Elderberry, (*S. melanocarpa*). Erect, medium shrub of moist places and along watercourses in the Douglas-fir to the subalpine zones. Deciduous; buds opposite, stout-stalked, rounded, large; auxiliary buds when present lateral; bud scales paired, brownish, somewhat thin; leaf scar large, broad V-shaped, bundle traces 3 or 5, very distinct; young stems gray-brown not glossy; pith reddish-brown, $\frac{1}{2}$ to $\frac{3}{4}$ stem diameter; older stems gray brown, furrowed; inflorescence pyramidal or round-topped; fruit berrylike, black. Grazing value fair for big game; fruit valuable to birds.

SARCOBATUS VERMICULATUS, Black Greasewood. An erect, spiny, medium shrub of saline bottoms and gumbo soils in open valleys and plains of central and eastern Montana. Deciduous; buds alternate, partially sunken, emerging below the persistent side branchlets and through the leaf scar, naked, tight cluster of rudimentary, densely felty leaves; leaf scar U- to V-shaped, split into 3 segments by bud; young stems tawny, smooth, pith white, star-shaped, $\frac{1}{4}$ to $\frac{1}{2}$ stem diameter; older stems grayish to black, roughened to furrowed or stringy, pith white, small, wood yellowish-green; branchlets rigid, pointed; fruit top-shaped with a circular wavy ring around its middle, dry semi-persistent. Grazing value good for deer and antelope in southeastern Montana; browsed by livestock in winter, considered poisonous for sheep.

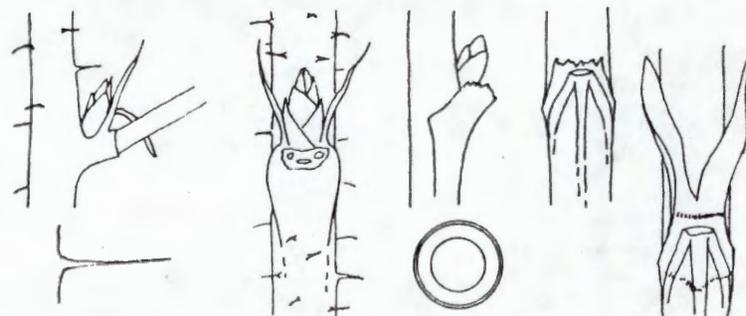
SHEPHERDIA ARGENTEA, Buffaloberry, (*Elaeagnus utilis*, *Lepargyrea argentea*). Thorny, tall shrubs to small trees of draws and bottom lands in plains. Deciduous; buds opposite, naked, small, densely covered with overlapping silvery scurfy scales; leaf buds valvate to paired rudimentary leaves, sessile to apparently stalked, somewhat flattened and blunt-pointed, parallel to the stem; flower buds stalked, globular, lateral, divergent to the stem; leaf scar small, semicircular, brown, bundle trace 1; young stems silvery-gray, overlapping scurfy scales, pith dark brown, less than $\frac{1}{2}$ stem diameter; older stems, dark gray with black flecks, rough, pith dark-brown, round, less than $\frac{1}{5}$ stem diameter; wood yellow; armed with sharp-pointed, rigid stem tips; inflorescence crowded racemes; fruit berrylike, bright red, acid, semi-persistent. Grazing value good for deer; fruit valuable for birds. Valuable cover plant for sharptail grouse and other birds.

SHEPHERDIA CANADENSIS, Russet Buffaloberry, Nannyberry, (*Elaeagnus canadensis*, *Lepargyrea canadensis*). A medium, upland, understory shrub of coniferous forest at medium elevations, widespread. Deciduous; buds opposite, naked, densely covered with overlapping brownish scurfy scales; leaf buds valvate with a pair of rudimentary leaves, stalked, lance-shaped, flattened; keeled, oriented edgewise to the stem; flower buds stalked, very small, globular, lateral; leaf scar small, semicircular, dark-brown, bundle trace 1; young stems light brown to orange-brown, with overlapping scurfy scales with a brown central dot; older stems gray, scurfy, bark where free of scurfy scales dark reddish-brown; pith dark-brown, round less than $\frac{1}{4}$ stem diameter; wood white; inflorescence crowded racemes; fruit berrylike, red, bitter. Grazing value medium to low for deer and elk; fruit valuable for grouse and songbirds.



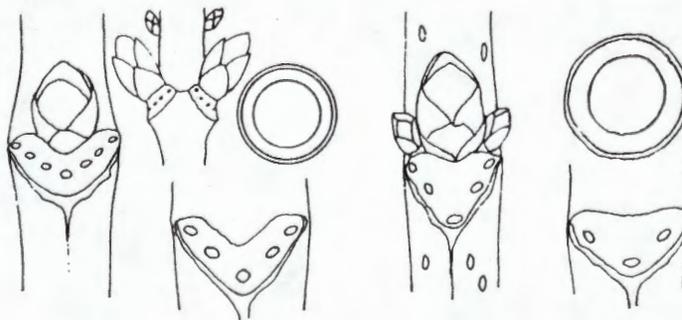
Rosa nutkana

R. woodsii



Rubus idaeus

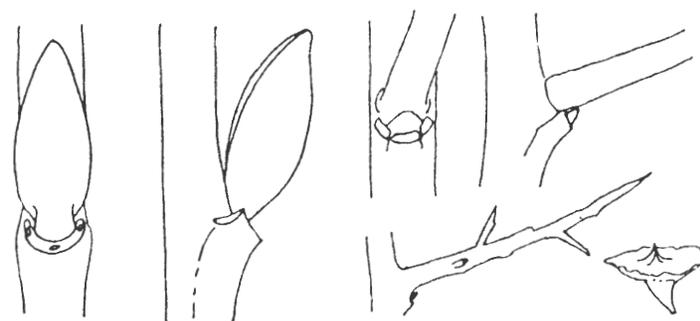
R. parviflorus



Sambucus cerulea

S. racemosa

SORBUS SCOPULINA, Mountain Ash. Medium to tall shrub of moist sites in the Douglas-fir zone. Deciduous; buds alternate, large, few scales, gummy; bud scales imbricate, large, dark reddish-brown, scattered white hairs on margin and tip; leaf scar raised, bordered by a dark band, crescent-shaped, bundle traces 5; stipules falling before flowering; young stems greenish to reddish-brown, hairy immediately above the buds, lenticels white, elongated, scattered, pith white, round, about $\frac{1}{2}$ stem diameter; older stems greenish-gray to reddish-brown, smooth, lenticels nearly round, pith dark; inflorescence a rounded corymb; fruit berrylike, orange to red, shiny. Grazing value little or none for livestock or big game; fruit valuable to birds and other wildlife.

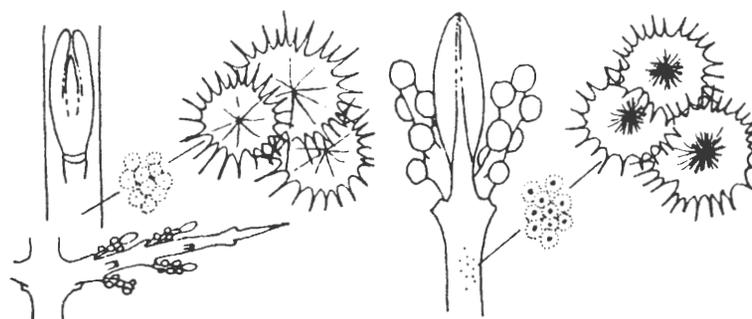


Salix

Sarcobatus vermiculatus

SORBUS SITCHENSIS, Pacific Mountain Ash. A medium shrub of forests of northwestern Montana; more commonly at higher elevations in the mountains. Deciduous; buds alternate, large, few scales, not gummy; bud scales imbricate, dense, rusty to yellowish hairy; leaf scar similar to *S. scopulina*; stipules persistent or late falling, membranous, reddish pubescent; young stems reddish-purple, densely rusty hairy; older stems reddish-gray, glabrous; other stem characteristics and inflorescence similar to *S. scopulina*; fruit berrylike, red, glaucous. Grazing value probably the same as for *S. scopulina*.

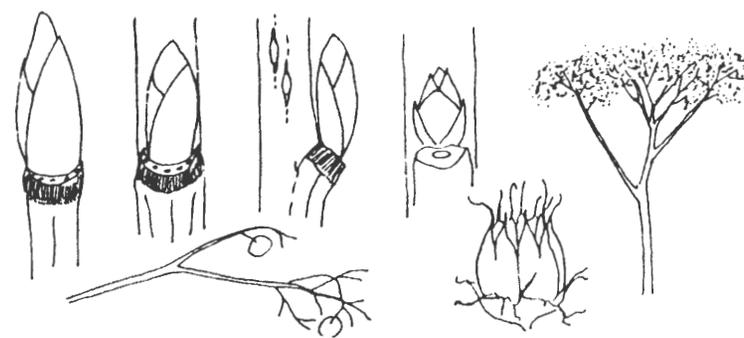
SPIRAEA BETULIFOLIA, White Spiraea, (*S. lucida*). Low erect, clonal shrub of the ponderosa pine and Douglas-fir zones at low to medium elevations; common. Deciduous; buds alternate, sessile, small, somewhat divergent; bud scales imbricate, brown, glabrous, small, thin; leaf scar small, triangular, raised bundle trace 1; young stems reddish-brown, glabrous, slightly ridged near buds; pith white, over $\frac{1}{2}$ stem diameter; older stems dark gray, exfoliating in irregular sheets; inflorescence terminal, flat-topped, long persistent; fruit a very small 5-chambered follicle. Grazing value low for livestock, probably also for big game.



Shepherdia argentea

S. canadensis

SPIRAEA DOUGLASII, Douglas Spiraea. Low shrub of moist coniferous forests at higher elevations in the mountains of northwestern Montana. Deciduous; buds alternate, sessile, small; bud scales imbricate, brown, densely white felty to woolly, pointed; leaf scar small, crescent-shaped, slightly raised, bundle trace 1; stipules semipersistent; young stems dark orange-brown, pubescent towards the tip, pith brown; older stems brown to grayish brown, shreddy to slightly furrowed; pith brown, slightly angled, less than $\frac{1}{2}$ stem diameter, wood green, annual rings distinct; inflorescence pyramidal to conical (vertically elongated); fruit a very small 5-chambered follicle with sepals and stamens persistent. Grazing value for livestock or big game, low or none.



Sorbus scopulina

Spiraea betulifolia

SYMPHORICARPOS ALBUS, Snowberry, (*S. racemosus*, *S. rivularis*). Low to medium, erect, clonal shrub of open forest and adjacent grasslands in the ponderosa pine and Douglas-fir zones; most common snowberry in western Montana. Deciduous; buds opposite, sessile to stalked, small; bud scales paired, light brown very small, pointed; leaf scars torn, semicircular to triangular, raised; bundle trace 1, indistinct

due to irregular fragmenting of leaf stalk base; paired leaf scars connected by a continuous ridge; young stems light brown, glabrous; older stems grayish, stringy to shreddy; pith brown, round, hollow, $\frac{1}{3}$ stem diameter; fruit berrylike, white, globular. Grazing value fair for deer and elk, low for cattle; heavily used on overstocked ranges.

SYMPHORICARPOS OCCIDENTALIS, Western Snowberry. Low clonal shrubs of plains and valley bottoms, most common in eastern Montana. Nearly identical to *S. albus* in most winter characteristics but can be distinguished by its sparse, short, white, pubescent stems. Grazing value somewhat higher than for *S. albus*.

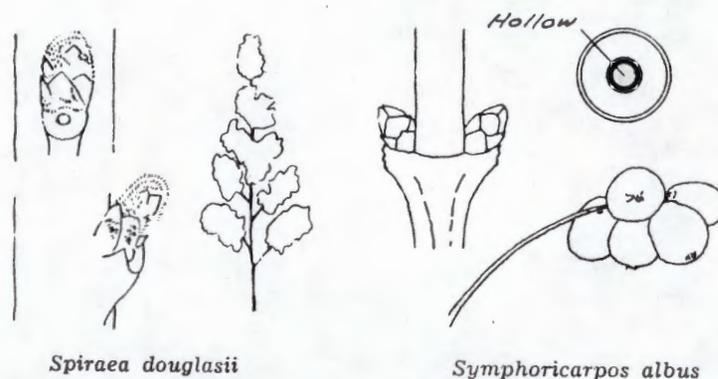
SYMPHORICARPOS ORBICULATUS, Coralberry. Low to medium shrub of open woods and thickets, sparsely and widely scattered across the State at lower elevations. Very similar to *S. albus* in nearly all winter characteristics; distinguished from it by a solid pith and the fruit, when present, red rather than white. Grazing value unknown but probably similar to *S. albus*.

SYMPHORICARPOS OREOPHILUS, Whortleleaf Snowberry, (*S. vaccinioides*, *S. tetonensis*). Low shrubs of hills and plains, sparsely and widely scattered east of the Continental Divide. Very similar to *S. albus* in winter characteristics; distinguished from the other three species by the combination of solid pith and white fruit. Grazing value probably the highest of the four species.

TAXUS BREVIFOLIA, Yew. A small tree to usually a straggling shrub of cool exposures along mountain streams at medium elevations or of the cedar-hemlock zone in northwestern Montana. Evergreen; leaves (needles) alternate, spirally attached (but twisted leaf bases make them appear to lie in a flat plane on either side of the stem), linear, entire margin, mucronate tip, glabrous, green to yellow-green; young stems leafy, greenish, glabrous; older stems greenish, brownish to purplish; wood rose-red (heartwood) to pale yellow (sapwood), fine-ringed; inflorescence solitary; fruit on female plants only, a bright red, fleshy, mucilaginous cup nearly covering the pointed seed. Grazing value for livestock or big game unknown; fruit eaten by birds.

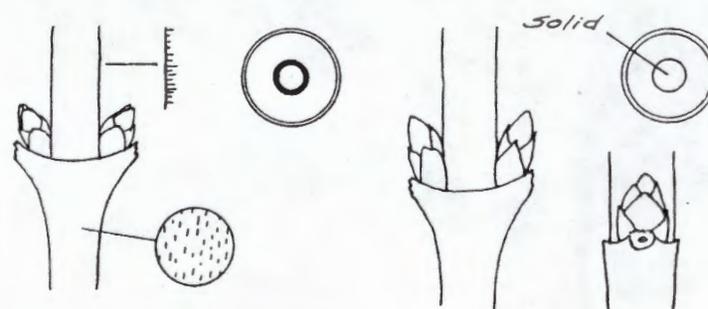
TETRADYMIA CANESCENS, Spineless Horsebrush. A low half-shrub of mountain grasslands, foothills, and plains; principally east of the Continental Divide. Deciduous; buds alternate, not apparent and obscured beneath a dense, woolly mat of hair; leaf scars small, obscure; young stems white, very densely woolly, pith brown, round, leaf base and bud give stem a "knobby" appearance; older stems gray-black, shreddy; inflorescence a head, with 4 persistent chaffy bracts. Grazing value none for livestock or big game; grazed by sheep but poisonous to them if consumed in large quantities. Increases on cattle and horse ranges with overgrazing.

VACCINIUM, Huckleberry and Whortleberry. A fairly difficult genus requiring both flower and fruit to accurately identify species. Winter characteristics are imperfectly known, and those in the key



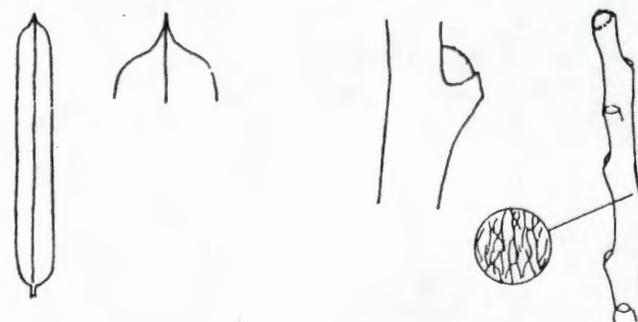
Spiraea douglasii

Symphoricarpos albus



Symphoricarpos occidentalis

S. oreophilus



Taxus brevifolia

Tetradymia canescens

are only tentative. All members of this genus can be recognized at once in winter condition by the very short projection of the stem tip beyond the apparent "terminal" or last bud (true terminal buds are lacking), and all but one uncommon species have valvate buds. As a general rule, the taller (thinleafed) species of *Vaccinium* are considered fair browse for elk and caribou, less so for deer. Grazing value for livestock, particularly cattle, is low or none. The fruit of *Vaccinium* is an important food for Blue and Franklin grouse in summer and early fall and also for songbirds, small mammals, and bears.

VACCINIUM CAESPITOSUM, Dwarf Huckleberry. A low (8 inches or less), tufted, sometimes mat-forming shrub of the moister coniferous forest at medium elevations in the mountains. Deciduous; buds alternate, sessile; bud scales valvate, red to yellowish-green; leaf scar crescent-shaped, dark brown, bundle trace 1, indistinct; young stems round to slightly angled, red to yellowish-green, moderately white felt; older stems reddish, brownish or greenish to grayish, slightly pubescent to glabrous; pith light, about $\frac{1}{4}$ stem diameter, indistinct, wood white; inflorescence solitary in axils; fruit a blue, glaucous, sweet, berry. Grazing value low for big game; fruit valuable for birds.

VACCINIUM GLOBULARE, Blue Huckleberry. A low to medium shrub of moist woods of the Douglas-fir and cedar-hemlock zones. Very similar in all respects to *V. membranaceum*. Variation of winter characteristics between these two apparently overlapping so that no distinguishing characteristic exists for specific identification. Grazing value for livestock or big game probably similar to that of *V. membranaceum*.

VACCINIUM MEMBRANACEUM, Thinleaved Huckleberry. Low to usually medium shrubs of coniferous forests in open to shady sites at medium elevations in the mountains. Deciduous; buds alternate, sessile; bud scales valvate, red to pale green, glabrous; leaf scar small, triangular, raised, bundle trace 1; young stem angled, reddish (often yellowish-green in shaded sites), glabrous; older stems reddish to brown, gray, slightly shreddy or checking, pith light brown, small; inflorescence solitary in axils; fruit a sweet blue-black berry. Grazing value fair for deer as summer forage; fruit valuable for bear and birds.

VACCINIUM MYRTILLOIDES, Velvetleaf Huckleberry. Low shrubs of moist woods, meadows, and boggy ground at high elevations in the spruce-fir zone; believed to be uncommon in the State. Deciduous; buds alternate, sessile; bud scales imbricate (paired); young stems round, greenish, densely pubescent; older stems brownish, glabrous; inflorescence crowded racemes from the first 2 or 3 buds terminating the 2-year-old stems; fruit a glaucous, sour blue berry. Grazing value for livestock and big game unknown; fruit valuable for birds.

VACCINIUM MYRTILLUS, Myrtle Whortleberry. Low, erect shrubs of subalpine forests. Very similar in many characteristics to *V. scoparium*, but may be distinguished, with some difficulty, by the following characteristics: plants not so erect, more robust; branches not

so erect, more open (not broomlike), thicker and stouter; grooves between angles of the stem sparsely to indistinctly pubescent; leaves (occasionally present) larger and more distinctly toothed; fruit dark red to bluish. Grazing value similar to *V. scoparium*.

VACCINIUM OCCIDENTALE, Western Huckleberry. A low to medium shrub of meadows and boggy ground at high elevations; believed to be uncommon in the State. Deciduous; buds alternate, sessile, small ($\frac{1}{8}$ inch); bud scales paired (imbricate), dark reddish-brown, glabrous; leaf scars flat-triangular to crescent-shaped, prominent, raised, bundle trace 1, slightly projected; young stems round, cinnamon-brown, glabrous; older stems gray-brown to dark reddish-brown, slightly shreddy to glabrous; pith light brown, about $\frac{1}{2}$ stem diameter; wood white; inflorescence solitary to short racemes from the first 2 or 3 buds terminating the 2-year-old stems; fruit a glaucous blue berry. Grazing value unknown for livestock and big game; fruit valuable for birds.

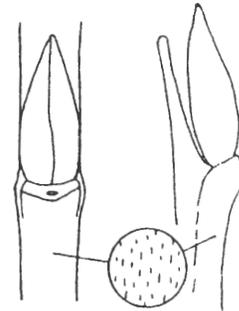
VACCINIUM OVALIFOLIUM, Ovalleaf Huckleberry, Blueberry. A medium straggling to spreading shrub of open woods at medium elevations in the mountains; believed to be scarce in northwestern Montana. Difficult to distinguish from the *V. membranaceum*-*V. globulare* complex. Deciduous; buds alternate, sessile, round-pointed; bud scales valvate, yellow-green, glabrous; leaf scars, small, crescent-shaped, bundle trace 1; young stems strongly angled, yellowish-green to reddish-green (green on angles, red in grooves) older stems grayish, shreddy; inflorescence solitary in axils; fruit a blue-black berry. Grazing value for livestock and big game unknown; fruit valuable for birds.

VACCINIUM SCOPARIUM, Grouse Whortleberry. Low, erect shrub of medium elevation coniferous to subalpine forests; particularly common as an understory shrub in lodgepole pine stands. Deciduous; buds alternate, sessile, small; bud scales valvate, green, glabrous; leaf scar very small, half round, raised, bundle trace 1; stems slender, erect, numerous, broomlike; young stems strongly angled or grooved, bright green to yellowish-green, glabrous; older stems at first angled and green (similar to young stems) then brown and round (4- to 5-year stems); pith small; wood white; inflorescence solitary in axils; fruit a bright red berry. Grazing value fair to good for mountain goats; possibly fair for deer and elk.

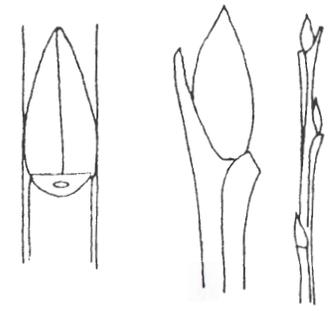
VIBURNUM EDULE, Mooseberry Viburnum, (*V. pauciflorum*). A medium, straggling shrub of moist forests and swamps in the spruce-fir zone of northwestern Montana. Deciduous; buds opposite, stalked, small; bud scales appearing valvate—their lower edges fused into a single structure, reddish-brown, glabrous, burst scales often persisting collarlike at base of last season's stem; leaf scar narrow, bundle traces 3; young stems brown, pith variably colored, about $\frac{1}{2}$ stem diameter; older stems grayish; inflorescence umbrellalike; fruit berrylike with a flattened stone (seed), red to orange, acid. Grazing value reported good in northwest Montana but low or little used in other areas; fruit valuable for birds.

VITIS RIPARIA, Wild Grape. A climbing vine on trees or shrubs in valley bottoms in southeastern Montana. Deciduous; buds alternate, sessile, short, blunt; bud scales 2-4, light brown; leaf scar hemispheric, bundle traces several; young stems reddish-brown to tan, smooth; pith brown, round, more than $\frac{1}{2}$ stem diameter; tendrils opposite the leaf scar, without adhesive or inflated disks; older stems dark brown to grayish, shreddy; inflorescence a panicle typical of grapes; fruit blue, glaucous. Grazing value none for livestock or big game, fruit valuable for birds.

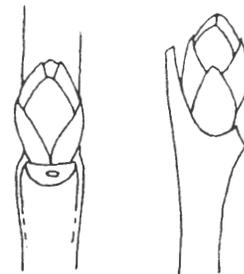
YUCCA GLAUCA, Yucca, Soapweed. A low to medium, armed shrub of foothills and plains east of the Rocky Mountains in Montana. Evergreen; leaves basal arising from a woody crown forming a clump, long, linear, flat, tapered to a sharp point, margin fibrous, long persistent; inflorescence a raceme borne on a tall (1-3 feet) central, woody stalk; fruit a 3-chambered capsule, persistent. Grazing value usually none for livestock or big game, except for flowers and seedlings which are taken during drought years.



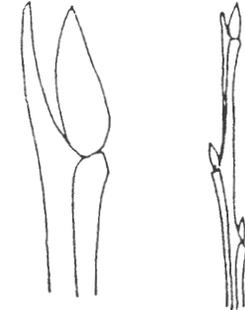
Vaccinium caespitosum



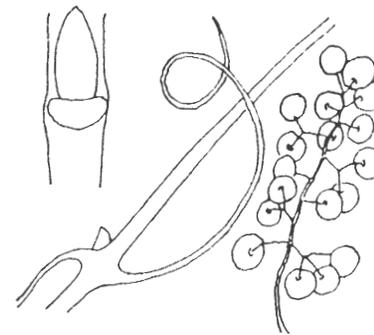
V. membranaceum



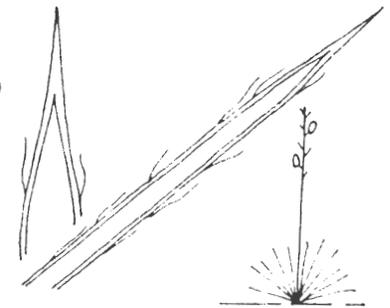
Vaccinium occidentale



V. scoparium



Vitis riparia



Yucca glauca

References

- Booth, W. E.
1950. Flora of Montana, Part I. Conifers and Monocots. Montana State College, Bozeman. 232 pp.
- Booth, W. E., and J. C. Wright.
1959. Flora of Montana, Part II. Dicotyledons. Montana State College, Bozeman. 280 pp.
- Dayton, William A.
1931. Important Western Browse Plants. U.S. Dept. Agr. Misc. Pub. 101. Washington, D.C. 214 pp.
- Dayton, William A., and thirteen associates (U.S. Forest Service)
1937. Range Plant Handbook. U.S. Dept. Agr., Washington, D.C. (looseleaf binder).
- Hayes, Doris W., and George A. Garrison.
1960. Key to Important Woody Plants of Eastern Oregon and Washington. U.S. Dept. Agr., Agricultural Handbook 148. Washington, D.C. 227 pp.
- Hitchcock, C. L., A. Cronquist, M. Ownbey, and J. W. Thompson.
Vascular Plants of the Pacific Northwest. University of Washington Press, Seattle.
1951. Part 3: Saxifragaceae to Ericaceae. 614 pp.
1959. Part 4: Ericaceae through Campanulaceae. 510 pp.
1955. Part 5: Compositae. 314 pp.
- Kelsey, Harlan P., and William A. Dayton.
1942. Standardized Plant Names. J. Horace McFarland Co., Harrisburg, Pa. 2nd ed., 673 pp.
- Kirkwood, J. E.
1930. Northern Rocky Mountain Trees and Shrubs. Stanford Univ. Press, California, 340 pp.
- Martin, Alexander C., Herbert S. Zim, and Arnold L. Nelson.
1951. American Wildlife and Plants. McGraw-Hill Book Co., Inc., New York. 500 pp.
- McKean, W. T. (Editor)
1956. Winter Guide to Native Shrubs of the Central Rocky Mountains with Summer Key. State of Colorado, Department of Game and Fish, Denver. 273 pp.
- Moss, E. H.
1959. Flora of Alberta. University of Toronto Press, Toronto. 546 pp.
- Peck, Morton E.
1961. A Manual of the Higher Plants of Oregon. Binforde and Mort, Portland. 2nd ed., 936 pp.
- Sudworth, George B.
1918. Miscellaneous Conifers of the Rocky Mountain Region. U.S. Dept. Agr. Bul. 680, Washington, D.C. 45 pp.

Glossary

- Alternate*. An arrangement of twigs, buds, or leaves not opposite or whorled; no counterpart at the same elevation on the opposite side of the stem. Characteristic of many shrubs (Fig. 1, twig).
- Appressed*. Lying against the main structure. Appressed hairs arise from the epidermis of stem or leaf and lie parallel to the surface (Fig. 2, pubescence, felty).
- Armed branchlets*. Distinct from thorns or spines, armed branchlets are characterized by buds, leaf scars, or fruit scars along branchlet (Fig. 2, armament; illus. of *Sarcobatus* and *Prunus americana*).
- Awllike*. Narrow and gradually tapering to a sharp point (illus. of *Juniperus communis*).
- Axil*. The inner, or upper, angle formed by the leaf and stem or by a side branch and the main stem.
- Bloom*. A waxy covering on leaves and fruit that gives a whitish or bluish cast.
- Bundle trace*. Figures on the surface of leaf scars formed by the ends of vascular bundles (Fig. 2, lateral bud).
- Catkin*. A bracted, usually pendulous, scaly flower or fruiting stalk (spike) bearing unisexual flowers without petals (Fig. 1, inflorescence).
- Ciliate*. Fringed with hairs on the edge or margin (illus. of *Amelanchier*).
- Crescent-shaped*. The shape of a sickle or quartering moon; used here to describe leaf scars varying from almost half-circle shaped (thick) to almost U-shaped (thin).
- Corymb*. An indeterminate inflorescence, more or less flat-topped, the outer flowers opening first (Fig. 1, inflorescence).
- Cuspidate*. Tipped with a sharp, rigid point.
- Cyme*. A determinate inflorescence, more or less flat-topped, the central (innermost) flowers blooming first.
- Deciduous*. Not persistent or evergreen; describes shrubs that lose their leaves at the end of the growing season. Plants that overwinter in a leafless state.
- Decumbent*. Describes shrubs with branches lying along the ground, but with the stem tips upturned.
- Deltoid*. Triangular-shaped.
- Divaricate*. Widely divergent; appendages or branches arranged nearly at a right angle to the place of attachment.
- Divided*. Leaf margins lobed or segmented nearly to the base (illus. of *Artemisia*).
- Entire*. Even or smooth margin of simple leaves and bud scales; without teeth or other division interrupting the edge (Fig. 2, margins).
- Erose*. Eroded or ragged-edged, irregularly toothed margins.
- Evergreen*. Leaves remaining on stem through winter in a green condition.
- Exfoliating*. Bark of either young or old stems breaking free in flakes or thin layers.
- Fibrous*. Having many woody fibers. The bark of some shrubs breaks free as long, stringy strands on the stem (illus. of *Physocarpus*).

Furrow. A depression on the upper surface of the leaf, usually due to the position of the midvein on the lower surface.

Glabrous. A smooth surface, free of hairs or scurfy material. Describes the surface of leaves, stems, or bud scales.

Glandular. Surface of leaves, bud scales, twigs or margins of leaves or bud scales having either stalked or stalkless, globular, usually minute glands (Fig. 2, pubescence).

Glaucous. Having a whitish or bluish-white covering on the stem. Usually a fine granular material (bloom) that rubs off.

Hairy. Scattered, loose epidermal hairs on stem, leaf, or bud surfaces.

Hemispherical. Used interchangeably with "half round" to describe leaf scars.

Imbricate. A shinglelike arrangement of scales or leaves, typical of shrubs with alternate branching. Describes one of the basic arrangements of bud scales (Fig. 2, bud types).

Inflorescence. Flowering branch or stem; technically, the arrangement of flowers on the stem.

Infrastipular. Refers to position of spines located immediately below the stipules or just below the leaf scar.

Internode. The part of a stem between two nodes (Fig. 1, twig).

Involucre. The scalelike green structures (bracts) that subtend flowers or inflorescences; the sepallike structures of sunflower heads.

Lance-shaped. Tapering at both ends, with the widest part below the middle.

Leaf base. That portion of the petiole (leaf stalk) remaining attached to the stem after the leaf has fallen or is broken off.

Leaf scar. The surface structure on the stem remaining after the fall of a leaf (Fig. 2, lateral bud)

Leaf segments. Parts of leaves which are lobed or divided but not compounded into leaflets.

Lenticels. Openings forming a spotted pattern on the bark of young stems. On older stems, they may form horizontal lines or figures (Fig. 2, lateral bud).

Lobes. Segments of a leaf produced by shallow indentation of leaf margin.

Mucronate. Tipped with an abrupt short, sharp point, a projection of the tip leaf or bud scale (Fig. 2, tips)

Naked. In this text, refers to buds which lack typical bud scales (Fig. 2, bud types).

Node. The portion of a stem supporting buds or branchlets. The stem is usually thicker at the node (Fig. 1, twig).

Opposite. An arrangement of buds, leaves, or branches, paired on opposite sides of stems at the same elevation.

Ovate. Egg-shaped, with the broadest part downward.

Paired. Used here to describe a form of imbricate bud with pairs of successive bud scales alternating 90 degrees (Fig. 2, bud types).

Panicle. A compound raceme (Fig. 1, inflorescence).

Pinnate. Arrangement of leaflets in a series along both sides of the leaf axis on a compound leaf (illus. *Mahonia repens*).

Pistillate. Seed-bearing cones of conifers or catkins of alder and birch, female.

Prickles. Synonymous with spines; small sharp-pointed epidermal projections (Fig. 2, armament).

Pubescence. Short, erect hairs on surface of leaves, stems, and buds (Fig. 2, pubescence).

Raceme. Inflorescence with flowers or fruit arranged on short stalks along a single axis (Fig. 1, inflorescence).

Retorse. The hairs or pubescence appressed and lying downward or backward on the surface.

Rolled. Margins of the leaf curled inward, usually toward the back of the leaf (Fig. 2, margins).

Scarious. Membranous or parchmentlike, thin and dry, not green.

Scurfy. A scaly textured surface on leaves and stems, formed by numerous, overlapping parasollike hairs or stalked scales (Fig. 2, pubescence; illus. of *Shepherdia*, *Elaeagnus*, and *Atriplex*.)

Sepals. The outermost flower segments. The sepals collectively constitute the calyx.

Spatulate. The shape of a leaf in which the tip end is rounded and wider than the basal half.

Spines. Short, thornlike, superficial structures, common in the roses and currants. As defined here, developed from surface or epidermal material, shallow-rooted, easily bent over or broken off (Fig. 2, armament).

Staminate. Stamen-bearing cones or catkins, not pistillate, male.

Stellate. Star-shaped or many-pointed.

Stems, young. Those stems developed during the last growing season; also referred to as "current annual growth."

Stems, older. Designates all stems developed before the last growing season (2 years old and older).

Stipules. Paired appendages borne at the base of the leaf stem; deciduous in most species, leaving a mark above and to one side of the leaf scar. The phrase "stipule persistent" suggests they will be found on most points of attachment, while "stipule generally deciduous" implies that most of them drop off (Fig. 2, lateral bud; illus. of *Potentilla* and *Purshia*).

Sunken. Describes a bud that appears to be partially or completely below the surface of the stem or leaf scar. The term "hidden bud" is sometimes used to describe a completely sunken bud (illus. of *Rhus glabra* for partially sunken and *Rhus trilobata* for completely sunken).

Tendrils. Slender threadlike structures by which vines attach themselves to a support.

Thorn. Large sharp-pointed abortive branch, deeply developed from a stem and containing vascular tissue (woody); cannot be easily broken or bent (Fig. 2, armament).

Toothed. The margin of leaves notched or cut to form a sawlike edge. May be finely or coarsely toothed (Fig. 2, margins).

Valvate. Paired outer bud scales with margins touching and wholly enclosing the bud (Fig. 2, bud types; illus. of *Acer* and *Vaccinium*).

Wood rays. In the stem cross section, the woody tissue alternates bands of thin cells radiating from the center (Fig. 1, stems).

Woolly. A loose covering of fine, tangled hairs (Fig. 2, pubescence).

Index

<i>Acer</i>		<i>Clematis</i>	
<i>douglasii</i>	18	<i>columbiana</i>	27
<i>glabrum</i>	18	<i>ligusticifolia</i>	27
<i>negundo</i>	18	<i>verticillaris</i>	27
<i>Actinea richardsoni</i>	32	<i>Clematis</i> , rock	27
<i>Alder</i>		<i>Coralberry</i>	58
mountain	18	<i>Cornus stolonifera</i>	27
thinleaf	18	<i>Cottonwood</i>	
<i>Alnus</i>		black	41
<i>crispa</i>	18	<i>lanceleaf</i>	39
<i>sinuata</i>	18	<i>narrowleaf</i>	39
<i>tenuifolia</i>	18	plains	41
<i>Amelanchier alnifolia</i>	18	<i>Crataegus</i>	
<i>Arctostaphylos uva-ursi</i>	20	<i>columbiana</i>	27
<i>Artemisia</i>		<i>douglasii</i>	29
<i>arbuscula</i>	20	<i>Currant</i>	
<i>arbuscula</i> var. <i>nova</i>	20	<i>alpine prickly</i>	50
<i>cana</i>	20	<i>American black</i>	46
<i>frigida</i>	20	<i>golden</i>	48
<i>michauxiana</i>	21	<i>Hudson Bay</i>	48
<i>nova</i>	20	<i>prickly</i>	50
<i>scopulorum</i>	21	<i>squaw</i>	48
<i>spinescens</i>	21	<i>sticky</i>	50
<i>tridentata</i>	21	<i>wax</i>	48
<i>tripartita</i>	21	<i>Dasiphora fruticosa</i>	41
<i>Ash, green</i>	30	<i>Devils club</i>	36
<i>Aspen, quaking</i>	41	<i>Dogwood, redosier</i>	27
<i>Atriplex</i>		<i>Dryas</i>	
<i>canescens</i>	21	<i>drummondii</i>	29
<i>confertifolia</i>	21	<i>octopetala</i>	29
<i>nuttallii</i>	23	<i>Echinopanax horridum</i>	36
<i>Bearberry</i>	20	<i>Elaeagnus</i>	
<i>Berberis repens</i>	36	<i>argentea</i>	29
<i>Betula</i>		<i>canadensis</i>	54
<i>fontinalis</i>	23	<i>canadensis</i>	29
<i>glandulosa</i>	23	<i>commutata</i>	54
<i>occidentalis</i>	23	<i>utilis</i>	54
<i>papyrifera</i>	23	<i>Elderberry</i>	
<i>Birch</i>		black	54
bog	23	blue	53
paper	23	<i>Eriogonum microthecum</i>	29
water	23	<i>Eriogonum</i> , slenderbush	29
<i>Bitterbrush</i>	43	<i>Eurotia lanata</i>	30
<i>Boxelder</i>	18	<i>Fraxinus pensylvanica</i>	30
<i>Broomweed</i>	30	<i>Gaultheria humifusa</i>	30
<i>Buckthorn</i>		<i>Gilia, granite</i>	34
<i>alderleaf</i>	45	<i>Gilia pungens</i>	34
<i>casara</i>	45	<i>Gooseberry</i>	
<i>Buffaloberry</i>	54	<i>Idaho</i>	48
<i>russet</i>	54	<i>redshoe</i>	50
<i>Cassiope</i>		<i>whitstem</i>	48
<i>mertensiana</i>	23	<i>Grape, wild</i>	62
<i>tetragona</i>	23	<i>Greasewood, black</i>	54
<i>Ceanothus</i>		<i>Gutierrezia sarothrae</i>	30
<i>evergreen</i>	25	<i>Hawthorn</i>	
<i>redstem</i>	25	<i>Columbia</i>	27
<i>snowbrush</i>	25	<i>Douglas</i>	29
<i>Ceanothus</i>		<i>Heather, white mountain</i>	23
<i>sanguineus</i>	25	<i>Hollygrape, creeping</i>	36
<i>velutinus</i>	25	<i>Holodiscus discolor</i>	30
<i>Cercocarpus ledifolius</i>	25	<i>Honeysuckle</i>	
<i>Cherry</i>		orange	34
bitter	43	<i>sweetberry</i>	34
pin	43	<i>Utah</i>	36
<i>Chimaphila umbellata</i>	25	<i>Horsebrush, spineless</i>	58
<i>Chokecherry</i>	43	<i>Huckleberry</i>	
<i>Chrysothamnus</i>		blue	60
<i>nauseosus</i>	27	<i>dwarf</i>	60
<i>viscidiflorus</i>	27	fools	36
<i>Cinquefoil, shrubby</i>	41	myrtle	60
		<i>ovalleaf</i>	61
		<i>thinleaved</i>	60
		<i>velvetleaf</i>	60
		western	61

<i>Hymenoxys richardsonii</i>	30	<i>Purshia tridentata</i>	43
<i>Juniper</i>		<i>Quercus macrocarpa</i>	45
common	32	<i>Rabbitbrush</i>	
<i>creeping</i>	32	<i>Douglas</i>	27
<i>Rocky Mountain</i>	32	<i>rubber</i>	27
<i>Juniperus</i>		<i>Raspberry, red</i>	53
<i>communis</i>	32	<i>Rhamnus</i>	
<i>horizontalis</i>	32	<i>alnifolia</i>	45
<i>scopulorum</i>	32	<i>purshiana</i>	45
<i>Kalmia polifolia</i>	32	<i>Rhododendron albiflorum</i>	45
<i>Kinnikinnick</i>	20	<i>Rhododendron, white</i>	45
<i>Labrador tea, western</i>	32	<i>Rhus</i>	
<i>Laurel, swamp</i>	32	<i>glabra</i>	46
<i>Ledum glandulosum</i>	32	<i>radicans</i>	46
<i>Lepargyrea</i>		<i>toxicodendron</i>	46
<i>argentea</i>	54	<i>trilobata</i>	46
<i>canadensis</i>	54	<i>Ribes</i>	
<i>Leptodactylon pungens</i>	34	<i>americanum</i>	46
<i>Linnaea borealis</i>	34	<i>aureum</i>	48
<i>Lonicera</i>		<i>ceruum</i>	48
<i>caerulea</i>	34	<i>hudsonianum</i>	48
<i>cauriana</i>	34	<i>inermis</i>	48
<i>ciliosa</i>	34	<i>irriguum</i>	48
<i>involuta</i>	34	<i>lacustre</i>	50
<i>utahensis</i>	36	<i>montigenum</i>	50
<i>Mahonia repens</i>	36	<i>petiolare</i>	48
<i>Maple, mountain</i>	18	<i>setosum</i>	50
<i>Menziesia</i>		<i>viscosissimum</i>	50
<i>ferruginea</i>	36	<i>Rosa</i>	
<i>glabella</i>	36	<i>acicularis</i>	50
<i>Menziesia</i>		<i>arkansana</i>	51
<i>rustyleaf</i>	36	<i>fendleri</i>	51
smooth	36	<i>gymnocarpa</i>	51
<i>Mockorange</i>	38	<i>nuttkana</i>	51
<i>Mountain ash</i>	56	<i>spaldingii</i>	51
<i>Pacific</i>	56	<i>ultramontana</i>	51
<i>Mountainheath</i>		<i>woodsii</i>	51
red	38	<i>Rose</i>	
yellow	39	<i>baldhip</i>	51
<i>Mountain lover</i>	38	<i>Nootka</i>	51
<i>Mountain mahogany, curleaf</i>	25	<i>prairie</i>	51
<i>Nannyberry</i>	54	<i>prickly</i>	50
<i>Ninebark</i>	39	<i>Woods</i>	51
<i>Oak, bur</i>	45	<i>Rubberweed, Colorado</i>	30
<i>Oceanspray</i>	30	<i>Rubus</i>	
<i>Oplopanax horridum</i>	36	<i>idaeus</i>	53
<i>Opulaster malvaceus</i>	39	<i>parviflorus</i>	53
<i>Oregon grape</i>	36	<i>strigosus</i>	53
<i>Pachistima myrsinites</i>	38	<i>Sagebrush</i>	
<i>Pachistima, myrtle</i>	38	<i>alpine</i>	21
<i>Parthenocissus quinquefolia</i>	38	<i>big</i>	21
<i>Penstemon fruticosus</i>	38	<i>black</i>	20
<i>Penstemon, shrubby</i>	38	<i>bud</i>	21
<i>Philadelphus lewisii</i>	38	<i>fringed</i>	20
<i>Phyllodoce</i>		<i>low</i>	20
<i>empetriformis</i>	38	<i>Michaux</i>	21
<i>glanduliflora</i>	39	<i>silver</i>	20
<i>Physocarpus malvaceus</i>	39	<i>threepip</i>	21
<i>Pingue</i>	30	<i>Saltic spp.</i>	53
<i>Pipsissewa</i>	25	<i>Saltbush</i>	
<i>Plum, wild</i>	41	<i>fourwing</i>	21
<i>Poison ivy</i>	46	<i>Nuttall</i>	23
<i>Poplar, balsam</i>	39	<i>shadscale</i>	21
<i>Populus</i>		<i>Sambucus</i>	
<i>acuminata</i>	39	<i>cerulea</i>	53
<i>angustifolia</i>	39	<i>melanocarpa</i>	54
<i>balsamifera</i>	39	<i>racemosa</i>	54
<i>sargentii</i>	41	<i>Sarcobatus vermiculatus</i>	54
<i>tacamahaca</i>	39	<i>Sericotheca discolor</i>	30
<i>tremuloides</i>	41	<i>Serviceberry</i>	18
<i>trichocarpa</i>	41	<i>Shepherdia</i>	
<i>Potentilla fruticosa</i>	41	<i>argentea</i>	54
<i>Princes pine</i>	25	<i>canadensis</i>	54
<i>Prunus</i>		<i>Silverberry</i>	29
<i>americana</i>	41	<i>Skunkbrush</i>	46
<i>demissa</i>	43	<i>Snakeweed</i>	30
<i>emarginata</i>	43	<i>Snowberry</i>	56
<i>melanocarpa</i>	43	<i>western</i>	58
<i>pensylvanica</i>	43	<i>whortleleaf</i>	58
<i>virginiana</i>	43		

Soapweed	62	Twinflower	34
Sorbus		Vaccinium	
occidentalis	56	caespitosum	60
sitchensis	56	globulare	60
Spiraea		membranaceum	60
betulifolia	56	myrtilloides	60
douglasii	56	myrtilus	60
lucida	56	occidentale	61
Spiraea		ovalifolia	61
Douglas	56	scoparium	61
white	56	Viburnum	
Sumac, smooth	46	edule	61
Symphoricarpos		pauciflorum	61
albus	56	Viburnum, mooseberry	61
occidentalis	58	Virginia creeper	33
obovulatus	58	Virginsbower	27
oreophilus	58	westers	27
racemosus	56	Vitis riparia	62
reticularis	56	Whortleberry	
tetoneasis	58	grouse	61
rubicinoides	53	myrtle	60
Syringa	38	Willows	53
Taxus brevifolia	58	Winterfat	30
Tetradymia canescens	58	Wintergreen	
Thimbleberry	53	alpine	30
Toxicodendron radicans	46	creeping	30
Twinberry		Yew	58
black	34	Yucca	62
red	36	Yucca glauca	62