

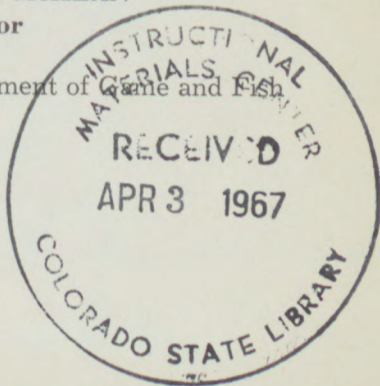


**WINTER GUIDE**  
to  
**NATIVE SHRUBS**  
of the  
**CENTRAL ROCKY MOUNTAINS**  
with **Summer Key**

Prepared and published under the provisions of  
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**WILLIAM T. McKEAN**  
Editor

State of Colorado, Department of Game and Fish



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A cooperative contribution of the Colorado Game and Fish Department and the Division of Range and Wildlife Management of the United States Forest Service, Region II, Denver, Colo.

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## PREFACE

THE responsibility for properly administering the grazing of range plants on public lands by livestock and wildlife falls to a great extent upon the personnel of the United States Forest Service, the United States Bureau of Land Management (Public Domain), and the various state game and fish departments.

In their work, the fieldmen of these agencies must be capable of identifying rapidly and accurately range plants in both summer and winter. They must, furthermore, recognize these plants after varying degrees of use, or abuse, by browsing animals. They must quickly recognize the signs of the times; that is, the signs of range conditions as expressed in the vigor and growth (or lack of it) of woody plants as well as grasses.

Similarly, the livestock men whose herds are privileged to graze upon the nation's public lands should be able to identify the plants upon which their animals feed; and should be able, honestly and accurately, to measure the extent to which the plants have been grazed each season.

Finally, the sportsman, whose license dollars support the game and fish departments, can better



appreciate and evaluate the work of their departments if they can recognize plants and range conditions when they go afield.

A considerable part of range inspection work must be done in winter, particularly that done in reference to big game use. The critical factor determining management of many big game species in many localities is the condition of winter range. Measurement of winter range use must be done before summer foliage appears, and identification must therefore be based on winter characteristics.

Today the public lands of the central Rocky Mountain region need the most intelligent and purposeful care possible by everyone concerned if they are to continue, without further serious deterioration, to furnish food and recreation for the growing human population. This illustrated book has been produced to partially meet this need. Personnel of the United States Forest Service, Rocky Mountain Region, and the Federal Aid Division of the Colorado Game and Fish Department have cooperated in writing this book. Specifically, it is designed to assist range and wildlife managers, livestock men, sportsmen, and the general public in the identification of the more important, native woody range plants, including a few deciduous trees, in winter. The plants included in the book are known to occur in Colorado, Wyoming east of the Continental Divide, the Black Hills of South Dakota, and the forested parts of western Nebraska. Also included are a few plants which occur near the outer bounds of this area and

which could logically be found within it in the future.

A few excellent books and bulletins have been written on the subject of winter botany. Most of them, however, are very general in character, covering the entire United States. None has been produced to cover the central Rocky Mountain region except Preston's *Rocky Mountain Trees*, which describes a number of the larger shrubs. The more general books have included in their keys and descriptions many species of shrubs which do not occur in this region. They have not, therefore, been very practical for field use by the forester, range manager, or wildlife manager.

Emphasis is placed in this book on woody plants that have, or may appear to have, value as food or cover for wildlife and livestock. Many, but not all by any means, of the half-woody, half-herbaceous shrubs are included here. Several of the tiny alpine shrubs are included even though they are largely not available for food in winter. Only fifteen deciduous trees and no conifers are included.

Concise descriptions of 107 plant species (75 genera) are given. Complementing these are 407 illustrations of which 395 are photographs and 12 are pen and ink sketches. Of the photographs, 131 are original and 264 were copied from drawings owned by the United States Forest Service and generously made available by them for publication. Some of the originals were taken from specimens kindly loaned by Dr. William A. Weber, curator

of the Herbarium of the University of Colorado.

Three keys are presented. The first is a key to the genera based on winter characters. This key should be the most valuable to the user.

The second is a series of very short keys to the species of some of the more important genera. These will be found introducing the descriptive material for each appropriate genus.

The third is a key to genera using leaf and stem characters as they appear in summer or fall, which follows the section on plant descriptions. Though not as complete as the winter key, it is believed that this simple key, and the leaf illustrations, will help the fieldman make correct associations between the winter and summer appearances of plants without having to wade through much technical terminology.

Some technical terms have been found necessary. An explanation of their meaning has been placed in the glossary near the end of this book.

The descriptions of plants are either original or are secured from the sources listed under the selected bibliography, particularly Harrington (1954) and Trelease (1918) for which grateful acknowledgment is here made. These descriptions include many facts not commonly known concerning botanical characters of twigs and buds which should be of value to the fieldman in making identifications in wintertime. In addition, there are notations on taste, odor, and the more outstanding wood characters. Rather general observations are made concerning the range and abundance of each



plant within the central Rocky Mountain area. Completing each description are statements concerning the palatability of the plants to big game and livestock, as well as observations on other uses made of them by wildlife and livestock.

Persons who have generously assisted with these descriptions, illustrations, and keys are:

United States Forest Service personnel: Ralph R. Hill, Ralph K. Gierisch, Herbert E. Schwan, Clark A. Anderson, Howard F. Harlan. Colorado Game and Fish Department personnel: Lawrence E. Riordan, Carwin D. Tolman, Paul F. Gilbert, Robert R. Elliott, Ferd C. Kleinschnitz and Don F. Bogart. Frank Gregg and Lyndle Dunn of the staff of *Colorado Outdoors* Magazine, directed the preparation of the manuscript and illustrations for printing.

Dr. H. D. Harrington, Professor of Botany, Colorado A. and M. College, assisted in early planning stages of the book. Dr. William A. Weber, Assistant Professor of Botany, University of Colorado, kindly made a helpful review of the manuscript.

The extended quotation in the introduction was taken from *Twig Key to the Deciduous Woody Plants of Eastern North America* by William M. Harlow, Professor of Wood Technology, College of Forestry, State University of New York, Syracuse, New York, permission for which is gratefully acknowledged.

Likewise, to Dr. R. J. Preston, Dean of the School of Forestry, North Carolina State College, go acknowledgments for use of the leaf pattern il-



illustrations and explanations in his book, *Rocky Mountain Trees*.

Nomenclature for both scientific and common names was adopted from Standardized Plant Names (2nd Edition, 1942), J. Horace McFarland Company, Harrisburg, Pennsylvania. Where plants appear to be more readily identified locally by some other common name, this name is also included in second place in the title of the appropriate descriptive page.

William T. McKean,  
*Editor*

Date: November 1, 1956

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# INTRODUCTION<sup>1</sup>

**EDITOR'S NOTE:** With the exception of parenthetical notes by the editor, the introduction which follows is quoted in its entirety from an earlier study on plant identification by Dr. William M. Harlow, Ph.D. Since such a practice is most unusual, a word of explanation is in order. The quotation is used because it would be extremely difficult and uselessly repetitive to attempt to construct as lucid and comprehensive a treatment of the subject at hand as that worked out by Dr. Harlow. Also, the purposes and scope of his publication and this one appear to be very similar. Of course, the quotation is made with Dr. Harlow's permission.

To most otherwise "forest-minded" folk, the approach to autumn, with its showers of many-colored leaves, spells the end of the season's activities in the identification of deciduous trees and shrubs. Without leaves, the members of the forest community, unless they be relatively large, seem to lose much of their summer's identity and may even descend to the level of "brush." This is in reality not the case, as may be easily discovered by examining any

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<sup>1</sup>From *Twig Key to the Deciduous Woody Plants of Eastern North America* (1941) by William M. Harlow, Ph.D., Professor of Wood Technology, State University of New York, College of Forestry, Syracuse, New York.

leafless twig with a 10X pocket lens, or even with the naked eye. A casual glance at some of the enlarged photographs in this bulletin will also serve to show that woody plants in winter are anything but featureless.

The first section in this bulletin comprises a description of some prominent twig characters of value in identification. At this point it should perhaps be mentioned that these so-called "winter features" are safe guides for a much longer period, and that twig and bud characters are in fact usable over the entire year except for three to four months in late spring and early summer when most of the growth for the current year takes place. In this connection, the winter buds of most deciduous trees and shrubs are already sufficiently formed for purposes of identification by July or early August. (This is also true of the few evergreens included in this bulletin.)

### **The Structural Features of Buds and Twigs**

#### **BUDS**

These structures which are plainly visible on most twigs are indicative of a resting stage brought on presumably by climatic conditions unfavorable to continued growth. A bud is in reality an embryonic branch and as such bears a number of miniature leaves or flowers which in many cases are clearly recognizable when the bud is carefully dissected. The buds of most woody plants are provided with scales, but in a few forms the buds are



unprotected except for the first pair of leaves which curl inward and shield those beneath (Buffalo-berry, Nos. 91 & 92). Buds of this sort are said to be *naked* in contrast to the more common *scaly* type which exhibits one or more scales (Cottonwood, No. 67). Certain woody plants seem to lack buds; in such instances, however, they are usually embedded in the twig or hidden beneath persistent leaf bases and emerge when growth begins in the spring (Bitterbrush, No. 75).

A marked difference in the size and form of individual buds is often observable on the same twig; the larger ones frequently prove to be *flower buds*, since they contain the rudiments of flowers, while the smaller and usually more numerous buds enclose only embryonic leaves — *leaf buds*: (Dogwood, No. 32). In some species, mixed buds containing both flowers and leaves are found.

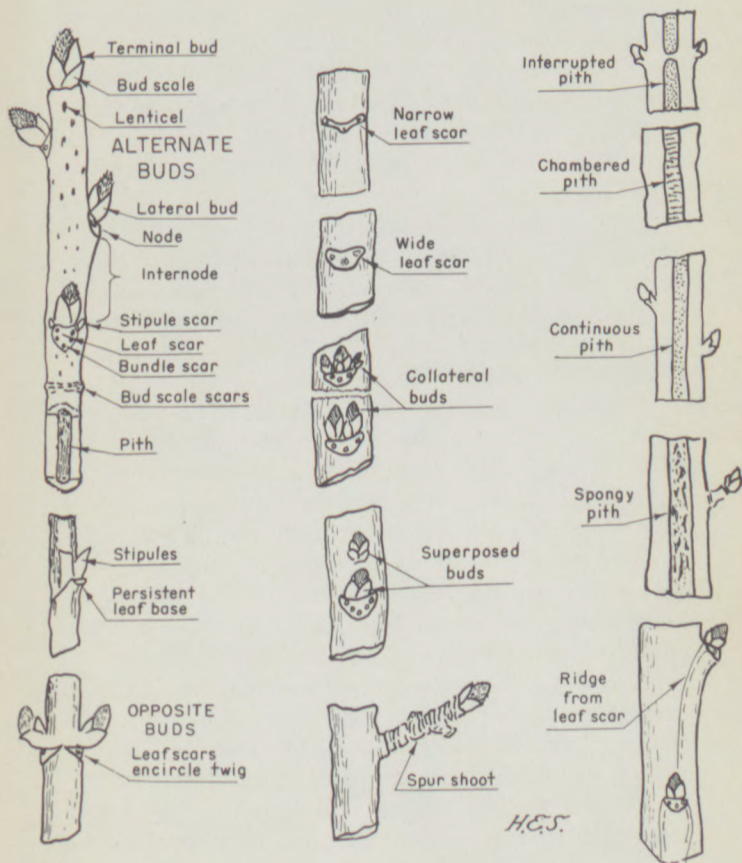
The normal position for buds is either in the axil or upper angle between leaf and stem, or at the apex (tip) of a twig. Those occurring in the leaf axils are called *lateral* or *axillary* buds, while the word *terminal* is reserved for the apical bud which is usually larger. This, as the term implies, is always borne directly on the end of the twig, and when once formed limits any further growth in length for the season. The twigs of some species lack a true terminal bud, and the growing point continues to advance until it exhausts the readily available food supply or is affected adversely by some other factor. The tender growing shoot then wilts and dies back to the last well formed lateral,

which meanwhile assumes a more or less terminal position (even though it often slants); this lateral bud is called a false or *pseudo-terminal* bud. A portion of the dead branch tip may persist for some time (Elder, No. 89) or the withered shoot may slough off, leaving a *branch scar* (Willow, No. 88). This never shows bundle scars, but rather three concentric rings of bark, wood, and pith respectively; it should not be confused with the leaf scar (see under leaf and bundle scars), which occurs on the opposite side of the twig directly below the pseudo-terminal bud. It is often very important to determine whether a twig has the one or the other type of end bud: A true terminal bud is usually larger than the laterals; and the twig never shows a branch scar at the base of the bud.

Three types of arrangement of lateral buds are found on twigs, viz: (1) *whorled* — in threes (or more), all at about the same height on the twigs (Jointfir, No. 40); (2) *opposite* — in pairs, opposite to each other (Fig. 1); and (3) *alternate* — in more or less evident spirals, with one bud at each node. In all three of these arrangements each bud is inserted directly above a leaf scar (Fig. 1). In some woody plants there is more than one axillary bud at the node, and the "extra" bud or buds are then designated as *accessory*. Two kinds of accessory buds are recognized, viz: (1) those which occur on either side of the normal lateral bud, the *collaterals* (Fig. 1), and (2) those inserted above the lateral bud, which are said to be *superposed* (Fig. 1).

A few woody plants are featured by buds with a

FIGURE 1. BUD AND TWIG CHARACTERISTICS OF SHRUBS IN WINTER.





single cap-like cover scale which usually splits along the side next to the twig when the bud opens (Willow, No. 88). This condition is relatively rare, however, and most buds are covered with from two to many scales, the number being practically constant for a given species or group of species. If the scales meet exactly without any overlapping (Whortleberry, Nos. 102-103), they are said to be *valvate*, while the term *imbricate* indicates the more usual condition in which the scales do overlap (Fig. 1).

Twigs may generally be divided into two groups: those which are angled at the nodes (Raspberry, Nos. 85-87), and those which are not angled (Mountain Maple, No. 1). There are many intermediate forms.

#### **LEAF SCARS AND BUNDLE SCARS**

Sometime prior to leaf fall, definite preparations are made by the tree to cast off its leaves which would soon lose their usefulness with the approach of frosty weather. At the base of the leaf stem (petiole) a protective abscission layer is developed consisting of cells which are more or less corky next to the twig, and thin walled and somewhat loosely organized toward the leaf. Slowly, the communication between leaf and twig lessens until finally the petiole becomes so weakened at the abscission layer that the leaf snaps off and only the corky place of attachment (now the *leaf scar* — Fig. 1) is left to mark its previous position.

On the surface of the leaf scar may be found from one to many small dots or lines, the *bundle*



scars, which indicate where the channels of sap conduction entered or passed from the leaf to the stem (Fig. 1). They present a variety of patterns and although often difficult to see without a lens, are of considerable diagnostic value. Occasionally, the bundle scars may be indistinct or they may be obscured by a portion of the leaf base which persists on the twig. In such instances a better view may often be obtained by carefully slicing off the surface layer of the leaf scar with a razor blade.

#### **STIPULE SCARS**

Stipules are small leaf-like organs occurring in pairs on the twig, one at each side of the petiole. They generally fall during the summer (rarely persistent), and usually leave on the twig small narrow scars (Fig. 1) which in some species completely encircle it. *Stipule scars* are not found in certain groups and, therefore, their presence or absence is often of value in identification.

#### **BUD SCALE SCARS**

These are narrow scars left by the scales of the terminal bud of the previous season, and appear as short, closely spaced transverse lines (Fig. 1). *Bud scale scars* are useful in determining the age of a twig since they persist for a number of years until obliterated as the bark thickens. Each group of scars indicates the end of a season's growth. (The serviceberry twig illustrated opposite description No. 4 made very slow growth during its last season.)

### **FRUIT SCARS**

These are similar in appearance to branch scars, but are often found in a terminal position. In twigs which normally have true terminal buds, their presence may be misleading unless a non-fruiting twig can be found.

### **THORNS, SPINES, AND PRICKLES**

These structures appear as sharp outgrowths of the twig, but presumably have different origins. Thorns are modified branches and as such usually bear leaf scars (Spiny Hopsage, No. 50) or are themselves branched and contain vascular tissue. Spines are considered to be modified persistent stipules (Gooseberry, No. 82) or modified leaf blades; or they may arise from the cortical tissues beneath the epidermis. They do not pull off with the bark (epidermis). Prickles emerge from the bark and readily pull off with it (Rose, No. 84).

### **SPUR SHOOTS**

In some species, certain twigs grow very slowly but at the same time maintain a more or less normal number of leaves. This results in short, usually stocky spurs with crowded leaf scars, termed spur shoots. Apple, cherry, birch and Juneberry are among those characterized by dwarfed branchlets of this type (Fig. 1).

### **LENTICELS**

Lenticels are small, often wart-like dots or patches distributed over the surface of the twig, and serve to admit air into the tissues beneath (Fig. 1).

## TWIG SURFACES, AND SHAPES IN CROSS SECTION

Twigs may be smooth (glabrous), hairy (pubescent), or covered with a bloom (glaucous). They may appear polished or dull. In cross section, twigs are circular (terete), oval, or from three to five angled.

## COMPOSITION AND SHAPE OF THE PITH

As seen in a lengthwise section, pith is commonly *continuous* and *homogeneous*, i.e., appears to be of uniform structure throughout (Fig. 1). However, in some species the whitish pith context is interrupted at intervals by narrow bars of darker tissue, and since these appear as cross partitions, the pith is said to be *diaphragmed*. Pith is sometimes *spongy*, i.e., filled with minute irregular cavities and occasionally chambered, i.e., hollow except for transverse partitions. Rarely it is partially or entirely excavated, or lacking.

The shape of the pith in transverse section is often characteristic; it may be terete (Mockorange, No. 62), oval, triangular, 5-angled or star-shaped. If available, a drop of phloroglucin reagent, or even dilute fountain pen ink will bring out the outline of the pith.

— From *Twig Key to the Deciduous Woody Plants of Eastern North America*,  
by William M. Harlow, Ph.D.



## How To Use The Keys

IN THE PAGES immediately following there appears an important tool to assist in recognizing the woody plants in winter. This tool is called a key. It is written as simply as possible, but if words appear in it that are new, they can quickly be found explained in the introduction just ahead of this page or in the glossary near the end of the bulletin.

This key will help distinguish one plant, or group of plants, from another by setting up questions or choices in pairs which must be answered. An example might help show how the key is used.

First, observe the stem in question and decide whether it has buds on it which are opposite to one another or whether they occur on alternate sides.

If the buds are alternate, you will note that by following the dotted line to the right-hand margin, you will be directed to the number 26, which refers to that number in the left-hand margin.

Here you must decide whether the stem is from a shrub or a vine. Assuming it is a shrub, you will be referred back to number 29 in the left-hand margin, and so on.

After a half dozen conclusions of this sort, if



you have not made a mistake, you arrive at a common plant name with a number in bold type before it and the scientific name in bold type beneath it. The number refers to the plant description number in the section of this book which follows this key; *it is not* a page number. You may check the accuracy of your decisions by turning to the numbered descriptions, with the illustrations on the opposite page.

Not all woody plants are to be identified by this key; there are always the exceptions to the rule. It is hoped, however, that these will not occur too often and that, with continued use, this key and the others in this book, will become a great source of satisfaction to anyone using them.

# WINTER KEY

## KEY TO THE GENERA OF THE MORE COMMON SHRUBS OF THE CENTRAL ROCKY MOUNTAIN REGION, USING WINTER CHARACTERISTICS

1. Buds (and leaf scars) alternate (1 at a node usually) ..... 26  
Buds (and leaf scars) opposite or whorled (2 or more at a node)..... 2
2. Buds (or leaves or leaf scars) 2 at each node (opposite) ..... 4  
Buds (or leaves or leaf scars) 3 at each node..... 3
3. Shrub .....40.\* — Ephedra  
Ephedra  
Vine .....30. — Western Virginsbower  
Clematis

### Opposites

4. Leaves represented by small persistent scales .....40. — Ephedra  
Ephedra  
Leaves normal (not scale-like), or petioles, or their scars present..... 5

\*Numbers in this position refer to the numbered descriptions of individual plants found on the following pages.

5. Climbing (vines) . . . . .	30. — Western Virginsbower	
	<b>Clematis</b>	
Not climbing (shrubs) . . . . .		6
6. Twigs covered with shield-shaped		
(peltate) scales . . . . .	91.-92. — Buffaloberry	
	<b>Shepherdia</b>	
Twig not covered with shield-shaped		
(peltate) scales . . . . .		7
7. Buds 2 to several at a leaf scar, small,		
superposed (one above		
another) . . . . .	45. — New Mexican Forestiera	
	<b>Forestiera</b>	
Buds not superposed . . . . .		8
8. With spines, thorns, or prickles . . . . .		9
Without spines or prickles . . . . .		10
9. Buds and leaf scars and bundle		
scars prominent . . . . .	78. — Buckthorn	
	<b>Rhamnus</b>	
Buds small; leaf scars inconspicuous		
(base of petiole and stipules		
persistent) . . . . .	31. — Blackbrush	
	<b>Coleogyne</b>	
10. Evergreen . . . . .		11
Deciduous . . . . .		13
11. Leaves gray-green, margins entire . . . . .		12
Leaves green, smooth, margins finely		
serrate . . . . .	59. — Boxleaf Myrtle	
	<b>Pachistima</b>	
12. Leaves scurfy . . . . .	14.-16. — Saltbush	
	<b>Atriplex</b>	
Leaves hairy (with appressed		
hairs) . . . . .	31. — Blackbrush	
	<b>Coleogyne</b>	
13. Leaf scars wide . . . . .		14
Leaf scars narrow or V-shaped . . . . .		18



14. Buds very large, over  $\frac{1}{4}$  inch in diameter, stalked ..... 89. — Elder  
**Sambucus**  
 Buds medium or small, not stalked..... 15
15. Bundle scars 3 or less; twigs not ribbed..... 16  
 Bundle scars more than 3; twigs with longitudinal ribs; buds blunt....47.-48. — Ash  
**Fraxinus**
16. Bundle scar 1, often indistinct or raggedly broken petiole .....95. — Snowberry  
**Symphoricarpos**  
 Bundle scars 3 ..... 17
17. Pith 6 angled, often hollow-centered on current twig growth.....54. — Honeysuckle  
**Lonicera**  
 Pith round, solid .....78. — Buckthorn  
**Rhamnus**
18. Lateral buds hidden or nearly so (rarely present at the lowest (first) node of **Jamesia**)..... 19  
 Lateral buds wholly visible..... 21
19. Terminal bud nearly always present, conspicuous, white-haired .....52. — Cliff **Jamesia**  
**Jamesia**  
 Terminal bud nearly always absent..... 20
20. Capsule opens at capsule partition; sepals fused to capsule for  $\frac{1}{3}$  their length, twigs gray and striated .....44. — Cliff Fendlerbush  
**Fendlera**  
 Capsule opens between capsule partitions; sepals fused to capsule  $\frac{1}{2}$  their length, twigs not gray or striated; exfoliating outer brown cortex ..... 62. — Mockorange  
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21. Leaf scars raised, often torn or indistinct .....95. — Snowberry  
**Symphoricarpos**

Leaf scars not prominently raised.....	22
22. Terminal buds long, taper-pointed, often swollen near base .....	24
Terminal buds not long, taper-pointed.....	23
23. Pith large, over $\frac{1}{2}$ the twig diameter. 89. — Elder <b>Sambucus</b>	
Pith small, less than $\frac{1}{2}$ the twig diameter .....	1.-2. — Maple <b>Acer</b>
24. Twigs glaucous (dull); bundle scars depressed .....	104.-106. — Cranberry <b>Viburnum</b>
Twigs shiny; bundle scars raised.....	25
25. Twigs hairy .....	32. — Redosier Dogwood <b>Cornus</b>
Twigs not hairy .....	1.-2. — Maple <b>Acer</b>

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26. Shrubs or trees .....	29
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27. Tendrils lacking .....	25. — Bittersweet <b>Celastrus</b>
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28. Pith interrupted at node; buds wooly (under the outer bud scales) .....	107. — Frost Grape <b>Vitis</b>
Pith continuous through node; buds not wooly .....	60. — Virginia Creeper <b>Parthenocissus</b>
29. Spines, thorns, or prickles present .....	30
Spines, thorns, and prickles lacking .....	47
30. Prickles present on the internodes .....	31
Prickles not present on the internodes .....	33
31. Pith with large cavities (spongy) .....	82. — Currant & Gooseberry <b>Ribes</b>

	Pith solid .....	32
32.	Pith over half the diameter of twig; base of prickle not greatly enlarged .....85.-87. — Raspberry	
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	<b>Rosa</b>	
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	<b>Mahonia</b>	
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	<b>Ribes</b>	
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	<b>Ribes</b>	
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 not sticky .....75. — Antelope Bitterbrush  
**Purshia**
53. Twigs very hairy .....42. — Common Winterfat  
**Eurotia**  
 Twigs not hairy or only sparsely so ..... 54
54. Leaf margins tightly  
 rolled back .....27.-28. — Mahogany  
**Cercocarpus**  
 Leaf margins not tightly rolled back  
 (may be rolled in) ..... 55
55. Leaves very shiny on top surface, leaf margins  
 serrulate with black dots..22.-24. — Ceanothus  
**Ceanothus**  
 Leaves not as above ..... 56
56. Leaves green, not scurfy .....9.-10. — Bearberry  
**Arctostaphylos**  
 Leaves gray, scurfy .....Saltbush  
**Atriplex**





not unpleasant . . . . .	83.	— New Mexican Locust	
		<b>Robinia</b>	
Leaf scars small, round; wood has unpleasant odor . . . . .	81.	— Skunkbush Sumac	
		<b>Rhus</b>	
68. Bud scales one . . . . .	88.	— Willow	
		<b>Salix</b>	
Buds scales more than one . . . . .			69
69. Bud scales 2, valvate . . . . .	102-103.	— Whortleberry	
		<b>Vaccinium</b>	
Bud scales more than 2 (or at least not valvate) . . . . .			70
70. Twigs hairy, wooly, scurfy or scaly . . . . .			71
Twigs glabrous, glaucous, or with gummy excretions . . . . .			93
71. Twigs ridged downward from ends of leaf scars at least full length of internode . . . . .			72
Twigs not ridged downward from ends of leaf scars full length of internode . . . . .			80
72. Bundle scars 5 or more . . . . .			73
Bundle scars 3 . . . . .			75
73. Pith star-shaped . . . . .	76.-77.	— Oak	
		<b>Quercus</b>	
Pith round or angled but not star-shaped . . . . .			74
74. Stipules or stipule scars present . . . . .	64.	— Mallow Ninebark	
		<b>Physocarpus</b>	
Stipules or stipule scars not present . . . . .	100.	— Poison Ivy	
		<b>Toxicodendron</b>	
75. Buds hairy . . . . .			76
Buds not hairy . . . . .	70.-73.	— Plum & Cherry	
		<b>Prunus</b>	
76. Spur shoots present . . . . .			77
Spur shoots absent . . . . .			78
77. Twigs red-brown, somewhat angled			

- at nodes .....27.-28. — Mahogany  
**Cercocarpus**
- Twigs light brown to tan color, not angled  
 at nodes .....51. — Bush Rockspirea  
**Holodiscus**
78. Twigs green, gray or  
 white color .....29. — Rabbitbrush  
**Chrysothamnus**
- Twigs brown or tan color ..... 79
79. Pith chambered .....26. — Hackberry  
**Celtis**
- Pith not  
 chambered...5.-7. — Leadplant or Indigobush  
**Amorpha**
80. Buds scurfy or scaly ..... 81  
 Buds hairy or wooly but not scurfy or scaly .... 82
81. Buds scurfy, gray .....14.-16. — Saltbush  
**Atriplex**
- Buds with scaly covering,  
 copper colored .....38.-39. — Silverberry  
**Elaeagnus**
82. Buds white .....97.-98. — Horsebrush  
**Tetradymia**
- Buds not white (may be gray) ..... 83
83. Leaf scar elevated to height  
 of bud .....14.-16. — Saltbush  
**Atriplex**
- Leaf scar not elevated to height of bud ..... 84
84. Bundle scars 7 or more in ellipse..76.-77. — Oak  
**Quercus**
- Bundle scars 5 or less ..... 85
85. Bundle scars 5 ..... 86  
 Bundle scars 3 or less ..... 87
86. Pith triangular, green  
 or brown .....3. — Thinleaf Alder  
**Alnus**

- Pith not triangular, white . . . . 100. — Poison Ivy  
**Toxicodendron**
87. Bundle scars 3 . . . . . 89  
 Bundle scars 1 . . . . . 88
88. Bud scales hairy at  
 margin only . . . . . 78. — Buckthorn  
**Rhamnus**
- Bud scales hairy over  
 the back . . . . . 22.-24. — Ceanothus  
**Ceanothus**
89. Leaf scars narrow . . . . . 92  
 Leaf scars wide . . . . . 90
90. Pith chambered . . . . . 26. — Hackberry  
**Celtis**
- Pith not chambered . . . . . 91
91. Buds stalked; pith  
 triangular . . . . . 3. — Thinleaf Alder  
**Alnus**
- Buds not stalked; pith round or angled, but not  
 triangular . . . . . 70.-73. — Plum & Cherry  
**Prunus**
92. Pith spongy or somewhat porous, wood  
 faintly marked with tangential white  
 bands . . . . . 82. — Currant & Gooseberry  
**Ribes**
- Pith continuous, not porous; wood not  
 tangentially banded . . . . . 93
93. Tips of buds obscured by hairs; tubular  
 receptacle often  
 persistent . . . . . 27.-28. — Mahogany  
**Cercocarpus**
- Tips of buds not obscured by hairs; bark of  
 current twig growth with numerous  
 longitudinal splits . . . . . 61. — Squawapple  
**Peraphyllum**
94. Twigs ridged downward from ends of leaf scars . . . . . 95



	Twigs not ridged downward from ends of leaf scars .....	101
95.	Buds waxy or gummy .....93. — Greene's Mountainash <b>Sorbus</b>	
	Buds not waxy or gummy .....	96
96.	Buds green .....29. — Rabbitbrush <b>Chrysothamnus</b>	
	Buds not green .....	97
97.	Bundle scars 7 or more in an ellipse .....76.-77. — Oak <b>Quercus</b>	
	Bundle scars less than 7 .....	98
98.	Bundle scar single, crescent-shaped or circular .....25. — Bittersweet <b>Celastrus</b>	
	Bundle scars more than one .....	99
99.	Bundle scars 3 .....	100
	Bundle scars 5 .....64. — Mallow Ninebark <b>Physocarpus</b>	
100.	Buds not hairy, leaf scars broad .....70.-73. — Plum & Cherry <b>Prunus</b>	
	Buds usually hairy at scale margins, leaf scars narrow .....4. — Serviceberry <b>Amelanchier</b>	
101.	Buds hairy or scurfy .....	102
	Buds not hairy or scurfy .....	109
102.	Buds scurfy .....14.-16. — Saltbush <b>Atriplex</b>	
	Buds hairy or wooly .....	103
103.	Leaf scar broad, nearly encircling the bud .....80. — Smooth Sumac <b>Rhus</b>	
	Leaf scar broad or narrow, but not encircling the bud .....	104

104. Leaf scars narrow .....4. — Serviceberry  
**Amelanchier**  
 Leaf scars broad ..... 105
105. Twigs or buds with gummy excretions ..... 106  
 Twigs or buds without gummy excretions ..... 107
106. Buds stalked .....3. — Thinleaf Alder  
**Alnus**  
 Buds not stalked .....19.-21. — Birch  
**Betula**
107. Leaf scars 2-ranked .....33. — Hazel  
**Corylus**  
 Leaf scars more than 2-ranked ..... 108
108. Bundle scars 7 or more .....76.-77. — Oak  
**Quercus**  
 Bundle scars single or joined  
 in a crescent .....78. — Buckthorn  
**Rhamnus**
109. Twigs with gummy globules ..... 110  
 Twigs without gummy globules ..... 111
110. Pith 3-pointed, solid; leaf scars broad;  
 elongated flower buds usually  
 present .....19.-21. — Birch  
**Betula**  
 Pith round, with cavities; leaf scars narrow;  
 elongated flower buds  
 lacking .....82. — Currant & Gooseberry  
**Ribes**
111. Bundle scars single, or not apparent ..... 112  
 Bundle scars more than one ..... 115
112. Bundle scar not visible on scale-like leaf base;  
 pith small, off center...96. — French Tamarisk  
**Tamarix**  
 Bundle scar one; pith central ..... 113
113. Twigs angled at the nodes, spur shoots  
 absent .....94. — Shingleleaf Spirea  
**Spiraea**

- Twigs not angled at the nodes,  
 spur shoots present ..... 114
114. Buds short, divergent .....25. — Bittersweet  
**Celastrus**  
 Buds not short, divergent.....78. — Buckthorn  
**Rhamnus**
115. Bundle scars 7 or more in an ellipse  
 or crescent .....76.-77. — Oak  
**Quercus**  
 Bundle scars 3 in a line (or arc) ..... 116
116. Leaf scars narrow .....117  
 Leaf scars broad .....70.-73. — Plum & Cherry  
**Prunus**
117. Buds rounded ..... 118  
 Buds pointed ...57. — American Hophornbeam  
**Ostrya**
118. Stipule scars present .....36. — Hawthorn  
**Crataegus**  
 Stipule scars  
 absent .....82. — Currant & Gooseberry  
**Ribes**

## Descriptions and Photos

THE PAGES to follow combine simple words and many pictures in the proper proportion to bring about a clear and, we hope, a lasting impression of many of the woody range plants of the central Rocky Mountain Region.

With this book in hand it is believed the woodsman or student may acquire a better understanding and appreciation for this subject, which may have at first appeared to be somewhat obscure and difficult.

No claim is made to completeness in the descriptions. A publication of this sort is never perfect. This work, however, is believed to cover the subject adequately for all practical purposes. It is designed for use in the field, and anyone with a little persistence can go a long way toward knowing his shrubs.

Needless to say, the winter and summer keys are in many cases necessary to positive identification. The reader is urged to use them.



ROCKY MOUNTAIN MAPLE



Winter  
twig, x 2



Branch with  
persistent fruit  
stalks, x  $\frac{2}{3}$



Enlarged twig  
and bud, x 5



Leaf, x  $\frac{1}{2}$



Fruit, x  $\frac{2}{3}$

## Key to the More Common Species of *Acer*

Buds glabrous, outer scales usually valvate. .1. *A. glabrum*

Buds hairy, outer scales opened at top. . . . .2. *A. negundo*

### 1. *Acer glabrum*

#### Rocky Mountain Maple

1. Usually a shrub, but occasionally reaching tree size.
2. Deciduous.
3. Old bark — smooth, gray (often silvery).
4. Twigs — slender, smooth, dark red, straight or slightly curved, nodes slightly swollen.
5. Lenticels — small, inconspicuous, light colored.
6. Pith — round, continuous, cream colored.
7. Buds — opposite, red, smooth,  $\frac{1}{4}$ " long or less, plump, ovate, somewhat flattened against the stem; bud scales paired, valvate.
8. Leaf scars — crescent or V-shaped.
9. Bundle scars — 3.
10. No stipule scars.
11. Fruit — 2 nut-like carpels, each with a thin wing, the wings diverging at an acute angle, the carpel and its wing an inch or more in length. The clusters of fruits often persist well into the winter.
12. Throughout Central Rocky Mountain area at lower and medium elevations. Not very palatable; browsed heavily only on over-stocked ranges.

BOXELDER



Winter, twig, x  $\frac{2}{3}$

Leaf and  
fruit, x  $\frac{1}{2}$



## 2. *Acer negundo*

### Boxelder

1. **Small to medium sized tree**, sometimes shrubby.
2. **Deciduous**.
3. **Old bark** — gray to light brown, furrowed, hard.
4. **Twigs** — green to purplish, usually velvety pubescent, not angled at nodes.
5. **Lenticels** — raised, gray to buff, often obscured by pubescence, more prominent on older twigs.
6. **Pith** — round, cream colored, continuous.
7. **Buds** — opposite, plump, short-stalked, reddish with gray pubescence, bud scales opposite in pairs, one to two pairs showing, outer pair joined at base, two lateral buds closely superposed by a terminal bud.
8. **Leaf scars** — opposite, narrow, V-shaped, transverse connecting ridge present, often with a bract at the point.
9. **Bundle scars** — 3, conspicuous, sometimes protruding.
10. **Stipule scars** — not evident.
11. **Fruit** — double-winged samaras (key fruits) in drooping racemes. This species dioecious.
12. **Stream banks and valley bottoms** at lower elevations throughout Rocky Mountain Region. Rather scarce except locally. Important as a shade tree. Fruits probably taken by birds and squirrels. Not especially palatable to livestock or game.



THINLEAF ALDER



Winter twigs, x  $\frac{2}{3}$



Winter twig with  
male catkins, x  $\frac{1}{2}$



Leaf and fruit or  
female catkin, x  $\frac{1}{2}$



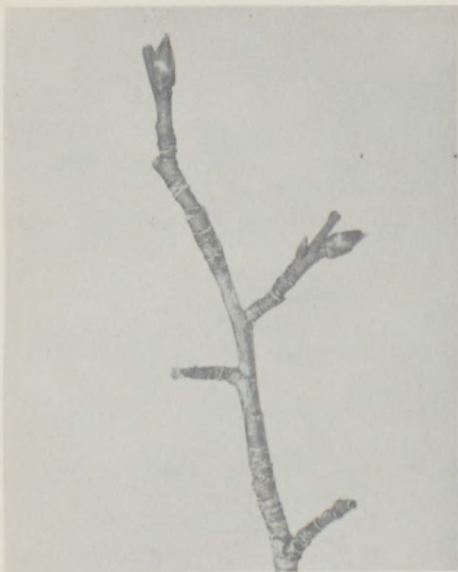
Enlarged seed and  
cone scale, x  $3\frac{1}{2}$

### 3. *Alnus tenuifolia*

#### Thinleaf Alder

1. **Shrubs** or small trees 6'-20' tall, often several stemmed from the base.
2. **Deciduous.**
3. **Old bark** — smoky or grayish brown, smooth or fissured, in rather large scaly areas.
4. **Twigs** — usually somewhat 3-sided, gray to brown, usually with short rusty hairs, sometimes angled at nodes.
5. **Lenticels** — small, 3-sided, continuous, greenish in small twigs, brown in older stems.
7. **Buds** — alternate, rather large, usually stalked, with 2 or 3 often subvalvate scales, dark, lop-sided or oval, heavily coated with gum.
8. **Leaf scars** — alternate, half round or reniform, somewhat raised.
9. **Bundle scars** — 3, the lowest sometimes compound.
10. **Stipule scars** — narrow.
11. **Fruit** — a persistent small ( $\frac{1}{3}$ " to  $\frac{3}{4}$ ") oval, cone-like catkin.
12. **Staminate and pistillate catkins** both present; 2-4 clustered at ends of twigs; the staminate about 1" long, the pistillate less than  $\frac{1}{4}$ " long.
13. **Throughout Central Rocky Mountain area**, except Black Hills, along streams and in moist places from foothills to spruce zone. Not abundant and not generally palatable to livestock or game. Important stream-bank cover.

SERVICEBERRY



Winter  
twig,  
x 1½



Fruit, x 2



Twig and fruit, x ⅔



Leaf, x ⅔

Key to the More Common Species of <b>Amelanchier</b>	
Twigs completely glabrous .....	<b>A. pumila</b>
Twigs pubescent on younger parts .....	<b>A. alnifolia</b>
Twigs permanently pubescent all over .....	<b>A. utahensis</b>

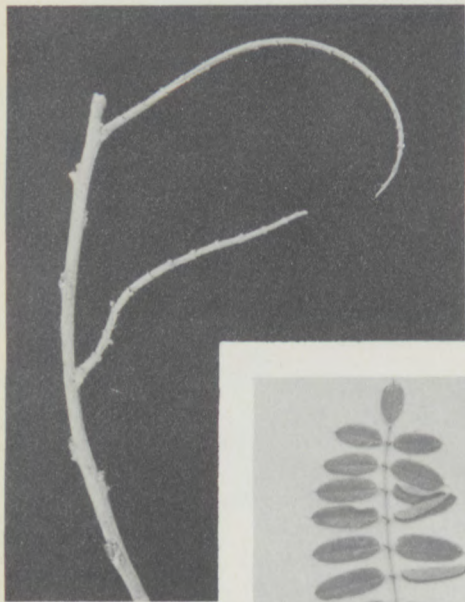
#### 4. **Amelanchier** spp.

Serviceberry, Juneberry, *et al.*

1. **Medium sized shrubs.**
2. **Deciduous.**
3. **Old bark** — only slightly rough, often purplish or pinkish gray, silvery.
4. **Twigs** — slender to medium, rigid, somewhat angled at nodes, terete, smooth to hairy, reddish brown or purplish; spur shoots usually present.
5. **Lenticels** — small, rounded, buff to gray.
6. **Pith** — round or somewhat 5-sided, continuous, light colored, spongy.
7. **Buds** — alternate, medium sized, elongate, usually hairy fringed from under bud scales, dark red brown to blackish. Frequently open partially in fall and winter.
8. **Leaf scars** — alternate, slightly elevated, narrowly crescent shaped.
9. **Bundle scars**—3.
10. **No stipule scars.**
11. **Fruit** — a pome — sometimes persisting in dried state, brown to very dark, often modified into galls. Eaten by birds, bear, and other wildlife.
12. **Has odor and taste** of bitter almond but not as strong as chokecherry.
13. **Streams, foothills and forests** throughout central Rocky Mountain area. Abundant and important browse in mountains for both game and livestock.



LEADPLANT AMORPHA



Winter twig, x 1



Leaves, x 1

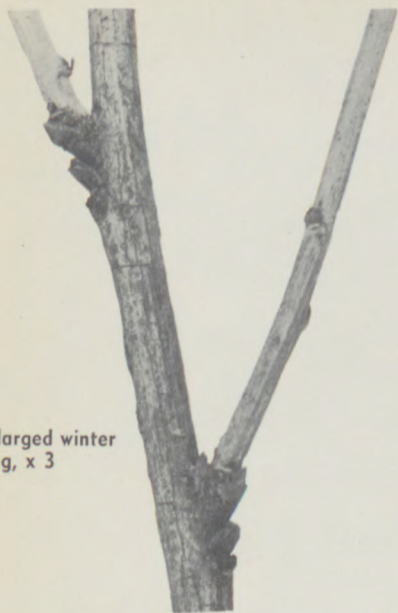
- Key to the More Common Species of **Amorpha**  
Knee-high, dry land shrubs .....5. Leadplant  
**A. canescens**  
Shoulder-high, wet land shrubs .....6. Indigo bush  
**A. fruticosa**

### 5. **Amorpha canescens**

#### Leadplant

1. **Shrub** — 1'-3' tall, hoary pubescent.
2. **Deciduous** — leaves gray hairy.
3. **Twigs** — very hairy, light gray with 8 longitudinal ridges, not conspicuously angled at nodes; no spur shoots.
4. **Lenticels** — inconspicuous.
5. **Pith** — round, continuous.
6. **Buds** — alternate, small rounded; bud scales several, hairy, brown.
7. **Leaf scars** — alternate, medium width.
8. **Bundle scars** — 2.
9. **No stipule scars.**
10. **Fruit** — a 1 or 2 seeded, villous canescent pod. Flower clusters several to many.
11. **Dry foothills** of Nebraska, Black Hills and eastern Colorado. An important winter food of cottontail rabbits in Nebraska; low palatability for deer and livestock; suspected of having poisonous qualities.

INDIGOBUSH



Enlarged winter  
twig, x 3



Winter bud, x 1½



Leaves and fruits, x ¼



Enlarged  
fruits, x 2

## 6. *Amorpha fruticosa*

### Indigobush

1. **Shrub** — sometimes tall and tree-like (6'-12'). In winter, dense stands have appearance of willow.
2. **Deciduous.**
3. **Twigs** — smooth, sometimes pubescent, brown, slightly angled at nodes, bark ridged.
4. **Lenticels** — inconspicuous.
5. **Pith** — round, continuous.
6. **Buds** — alternate, several scaled, brown, pointed, usually superposed — 2 at a node.
7. **Leaf scars** — alternate, medium width.
8. **Bundle scars** — 3.
9. **Stipule scars** — small, inconspicuous, stipules sometimes persisting.
10. **Fruit** — a 2 seeded pod,  $\frac{1}{4}$ "- $\frac{1}{2}$ " long, rather curved, glabrous but with resin dots.
11. **Along streams** in the plains area.



DWARFINDIGO



Branch with leaves and flowers (summer), x  $\frac{1}{2}$

## 7. *Amorpha nana*

### Dwarfindigo

1. **Very low**, erect shrub, 1'-3' tall.
2. **Deciduous** — leaves green, nearly glabrous.
3. **Twigs** — nearly glabrous.
4. **Lenticels** — small but visible.
5. **Pith** — rounded.
6. **Buds** — cone-shaped, dorsally flattened, glaucous.
7. **Leaf scars** — elliptical.
8. **Bundle scars** — single and raised.
9. **Stipule scars** — small.
10. **Fruit** — a 1 or 2 seeded pod  $\frac{1}{3}$ " long, straight dorsally, with a short erect or slightly oblique beak, densely punctate dotted; flower clusters single.
11. **Very rare** but reported to be along the Platte River to the mountains and northward into Manitoba.

GREENLEAF MANZANITA



Twig with  
leaves, x 1½

Winter bud, x 1½



Key to the More Common Species of  
**Arctostaphylos**

- Erect shrub, usually over 3' tall; leaves ovate  
with apiculate tip .....8. Greenleaf Manzanita  
**A. patula**
- Low, trailing plant, rarely over 12" high; leaves  
obovate, spatulate, rounded tip .....9. Bearberry  
**A. uva-ursi**

**8. Arctostaphylos patula**  
Greenleaf Manzanita

1. **Erect shrub**, 3'-6' tall.
2. **Evergreen**—the leaves elliptical, nearly round, often pointed at tip, thick, leathery, alternately arranged.
3. **Old bark**—scales off easily.
4. **Twigs**—hairy, reddish brown, scurfy and scaly, not conspicuously angled at nodes, spur shoots present.
5. **Lenticels**—inconspicuous.
6. **Pith**—round, sometimes irregular shaped, continuous, hard.
7. **Buds**—alternate, several scaled, brown or grayish-brown, rounded.
8. **Leaf scars**—half round.
9. **Stipule scars**—none.
10. **Fruit**—berrylike, reddish brown to black.
11. **Stipule scars**—none.
12. **Western Colorado**—more commonly in southwestern parts. Usually of very low palatability for deer and livestock but fruits and leaves probably taken to a limited extent by several wildlife species.



BEARBERRY



Winter twig  
with leaves, x  $\frac{2}{3}$

Leaves, x 1



## 9. *Arctostaphylos uva-ursi*

Bearberry, Kinnikinnick

1. **Low, creeping shrub** (prostrate or trailing) 3" to 12" high.
2. **Evergreen**, the leaves simple, alternate, with one principal vein, leathery, spatulate, margin entire, medium green, rather small ( $\frac{1}{2}$ "-1" long).
3. **Old bark** — thin shredding, reddish-brown.
4. **Twigs** — slender, flexible, somewhat 3 or 5 sided, gray pubescent outer bark, smooth reddish-brown beneath; not conspicuously angled at nodes; new twigs yellowish-green to reddish; finely pubescent.
5. **Lenticels** — inconspicuous.
6. **Pith** — small round to slightly angled, continuous, brown.
7. **Buds** — alternate, sessile, ovoid, several scaled, yellowish-green.
8. **Leaf scars** — alternate, somewhat elevated, small, crescent-shaped.
9. **Bundle scars** — 1 or 2, difficult to distinguish.
10. **Stipule scars** — lacking.
11. **Fruit** — persistent, red, berry-like with 5 nutlets sometimes fused together.
12. **Taste** — leaves have bitter taste.
13. **Distinguishable** from boxleaf myrtle by alternate, entire leaves.
14. **Throughout central Rocky Mountain area** in ponderosa pine, Douglas fir, and lodgepole pine zones. Very common in many types. A major item of food for deer and elk in the Black Hills, and important elsewhere. Berries important for bird food.

SILVER SAGEBRUSH



Branch with leaves  
and flower heads, x 1/4

## Key to the More Common Species of *Artemisia*

1. Deciduous .....13. Sand Sagebrush  
*A. filifolia*  
Evergreen ..... 2
2. Leaves linear, entire .....10. Silver Sagebrush  
*A. cana*  
Leaves not linear, 3-lobed  
or toothed .....11. Big Sagebrush  
*A. tridentata*  
*A. nova*  
*A. arbuscula*

### 10. *Artemisia cana*

#### Silver Sagebrush

1. Low shrub 1'-3' tall.
2. Evergreen — the leaves long and narrow, entire.
3. Twigs — densely gray-white canescent, not angled at nodes.
4. Lenticels — not apparent.
5. Pith — round, white, continuous.
6. Buds — alternate leafy — no true winter buds.
7. Leaf scars — alternate; narrow, V-shaped.
8. Bundle scars — 1.
9. No stipule scars.
10. Fruit — a small achene — dried inflorescence persistent.
11. Typical sagebrush odor and bitter taste.
12. In moist soils of plains and mountain valleys throughout the Central Rocky Mountain Region up to 10,000' or more. Relatively unpalatable but browsed by elk under pressure in winter. Heavily hedged by elk on one winter range in Bighorn mountains.



BIG SAGEBRUSH  
(*Artemisia tridentata*)



Winter twig with leaves, x  $\frac{2}{3}$



Winter twigs with leaves  
and persistent flowers, x  $1\frac{1}{2}$

## 11. *Artemisia tridentata*

### Big Sagebrush

(Including *A. arbuscula*, Low Sagebrush and  
*A. nova*, Black Sagebrush, illustrated on  
pages 50 and 51, respectively)

1. **Low to tall shrubs.**
2. **Evergreen**—leaves alternate, soft, silvery gray, very hairy (appressed hairs), with strong sage odor; 3 toothed at apex.
3. **Old bark**—gray brown to nearly black and shreddy.
4. **Twigs**—round, covered with closely matted gray hairs, not angled at nodes.
5. **Lenticels**—not evident.
6. **Pith**—round, continuous.
7. **Buds**—alternate, white, hairy, ovoid, obtuse, no true winter buds.
8. **Leaf scars**—small, difficult to distinguish.
9. **Bundle scars**—inconspicuous or lacking.
10. **No stipule scars.**
11. **Fruit**—small achenes; dried inflorescence persistent; panicle of yellow chaffy involucre.
12. **Wood light brown**, separating readily at annual rings—parenchyma rays very distinct in split or separate sections.
13. **Typical sage odor**; taste bitter.
14. **Occurs throughout central Rocky Mountain area**; low foothills and open mountain ridges and benches up to 10,000 ft. Important winter feed for big game in some areas and for sage grouse year-long.

LOW SAGEBRUSH  
(*Artemisia arbuscula*)  
(See page 49 for description)

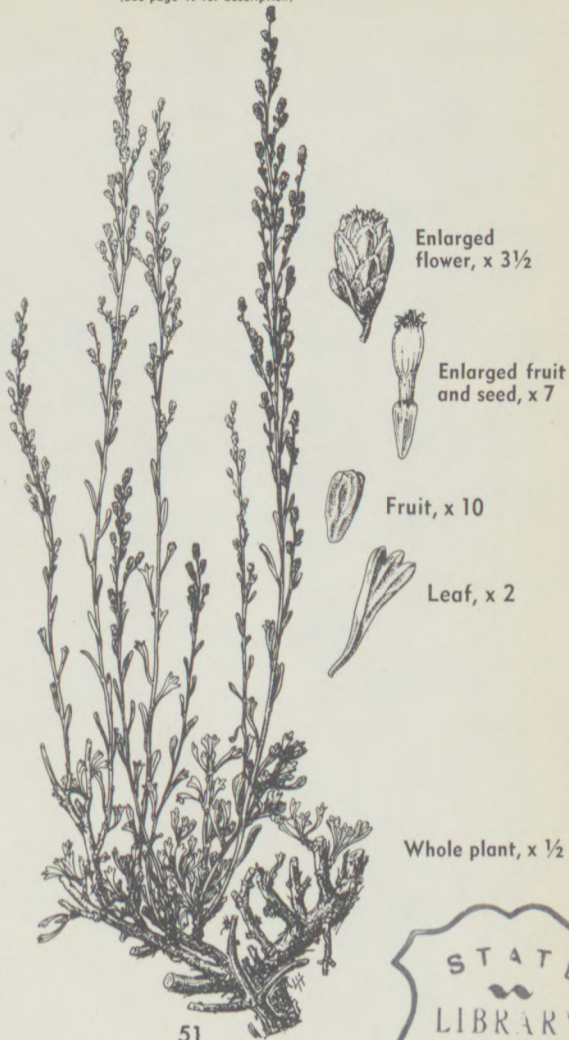


Whole plant, x  $\frac{1}{4}$  (approx.)

BLACK SAGEBRUSH

(*Artemisia nova*)

(See page 49 for description)





THREETIP SAGEBRUSH



Summer twigs, leaves, flower heads, x  $\frac{1}{4}$  (approximately)

## 12. *Artemisia tripartita*

### Threetip Sagebrush

1. **Very low shrub** — mostly less than 6" tall exclusive of flower stalks.
2. **Evergreen** — leaf tips divide into 3 long, narrow lobes, the lobes  $\frac{1}{3}$  to  $\frac{1}{2}$  the entire leaf length; leaves alternate but very closely spaced.
3. **Old bark** — shreddy, medium to dark brown.
4. **Twigs** — small, short, with silvery-gray pubescence.
5. **Lenticels** — not evident.
6. **Pith** — very small, dark brown.
7. **Buds** — true winter buds not present.
8. **Leaf scars** — small, narrow, raised.
9. **Bundle scars** — 1.
10. **No stipule scars.**
11. **Fruit** — small dry achene; dried inflorescence persistent.
12. **Wood light brown**; breaks into shreddy layers.
13. **Typical odor and bitter taste** of sagebrush.
14. **Dry wind-swept hills and plains** of southern Wyoming and northern Colorado, 8,000-9,000' elevation.

SAND SAGEBRUSH



Upper portions of two twigs showing persistent  
leaves and flowers, x  $\frac{1}{2}$

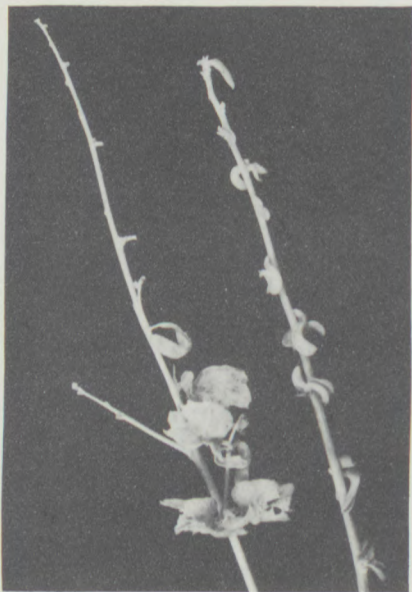
### 13. *Artemisia filifolia*

#### Sand Sagebrush

1. **Low, erect shrub** 1'-2' tall.
2. **Deciduous** — some leaves persistent.
3. **Leaves** — simple or deeply cleft into 3 linear lobes,  $\frac{1}{2}$ "-2" long, less than  $\frac{1}{16}$ " wide, filiform and entire, often fascicled, canescent or minutely tomentulose.
4. **Twigs** — freely branching, erect, slender, tan-colored to canescent.
5. **Pith** — small — indistinct.
6. **Buds** — not true winter buds, alternate, minute, hairy, white.
7. **Leaf scars** — not evident.
8. **No stipule scars.**
9. **Fruit** — a small achene. The numerous dried inflorescences persistent.
10. **Dry plains and sandy areas**, southern Black Hills, Nebraska, eastern Wyoming and eastern Colorado. Relatively unpalatable to game or livestock; provides cover for prairie chickens and sharp-tailed grouse.



FOURWING SALTBUCH



Winter twig with leaves and fruits, x 1



Spike of staminate  
flowers, x  $\frac{2}{3}$



Four-winged  
fruit, x 1



Leaves, x  $1\frac{1}{2}$

## Key to the More Common Species of *Atriplex*

1. Spine-tipped branches .....15. Shadscale Saltbush  
*A. confertifolia*
- Branches not spine-tipped ..... 2
2. Low, diffusely-branched shrubs, rarely more  
than 3' high .....16. Gardner Saltbush  
*A. gardneri*
- Stout, rigidly-branched shrubs, usually  
3'-5' high .....14. Fourwing Saltbush  
*A. canescens*

### 14. *Atriplex canescens*

#### Fourwing Saltbush

1. Rather rigid freely branched shrub 2'-5' tall.
2. Most leaves deciduous, but some partly developed leaves persisting through the winter; leaves linear, often involute.
3. Twigs — slender, tan to gray-scurfy, rigid, slightly spinescent, not angled at nodes.
4. Lenticels — not apparent.
5. Pith — small, indistinct.
6. Buds — lumpy, small, scurfy-wooly, bud scales absent.
7. Leaf scars — alternate, crescent-shaped.
8. Bundle scars — 3.
9. No stipule scars.
10. Fruit — a dry seed with 4 distinct, broadly dilated but variable wings.
11. Leaves and young twigs mildly salty to taste.
12. Plains and foothills, usually in deep heavy soils at lower elevations throughout central Rocky Mountain area but not abundant. Palatable to antelope and deer as well as sheep and cattle.

SHADSCALE SALTBUCH



Branch with  
leaves and  
spines, x  $\frac{1}{2}$

Winter twig with leaves, x  $\frac{2}{3}$

Staminate flowers  
in terminal spikes,  
x  $\frac{2}{3}$ ; 2-winged fruit, x 1

## 15. *Atriplex confertifolia*

### Shadscale Saltbush

1. **Diffusely branched shrub**, erect, rigid, somewhat spinescent, 1'-3' tall.
2. **Evergreen** — the leaves gray-green, scurfy, thick, ovate.
3. **Twigs** — silvery gray or tan, scurfy, often spine-tipped, ridged, sometimes angled at nodes.
4. **Lenticels** — not apparent.
5. **Pith** — lacking or not apparent.
6. **Buds** — alternate, no true winter buds.
7. **Leaf scars** — half round.
8. **Bundle scars** — lacking or very minute.
9. **No stipule scars.**
10. **Fruit** — a 2-winged seed, the wings broad, short and parallel.
11. **Salty taste.**
12. **Plains and valleys** with alkaline soils at lower elevations; Colorado and Wyoming. Makes up a large share of the intermountain desert winter range, especially for sheep.





16. *Atriplex gardneri*  
(*A. nuttallii gardneri*)  
Gardner Saltbush

1. Low shrub.
2. Evergreen — the leaves thick, gray-green, scurfy, long-ovate.
3. Twigs — scurfy, gray, not angled, usually short and curved.
4. Lenticels — not apparent.
5. Pith — lacking or indistinct.
6. Buds — scurfy, silver-green, no true winter buds.
7. Leaf scars — half round.
8. Bundle scars — inconspicuous.
9. No stipule scars.
10. Wood green in twigs.
11. Salty taste.
12. Found on definitely saline soils in Idaho, Wyoming and north central Colorado. Highly palatable to sheep and antelope.

GARDNER SALT BUSH

- A. Branch with twigs, leaves and male flowers, x  $\frac{1}{2}$
- B. Twig with male flowers, x 1
- C. Branch with female flowers, x  $\frac{1}{2}$
- D. Twig with female flowers, x 1
- E. Much enlarged fruits (flowering bracts), x  $3\frac{1}{2}$

BACCHARIS



Winter twig, x  $\frac{1}{2}$



Summer twigs, leaves, flowers, x  $\frac{2}{3}$

### 17. *Baccharis* spp.

#### Baccharis, Groundsel Tree

1. **Shrubs or half shrubs**—1' to 10' tall. Woody only at the base.
2. **Tardily deciduous.** Leaves quite variable in appearance among the different species. Usually willow-like, simple, entire or toothed.
3. **Twigs**—slender, leafy, several-ridged, green for long time, glabrous or puberulent.
4. **Lenticels**—inconspicuous.
5. **Pith**—crenulate, continuous, light colored.
6. **Buds**—quite small, several scaled, sessile; some species resinous.
7. **Leaf scars**—alternate, small, angularly crescent-shaped, decurrent in ridges from the angles.
8. **No stipule scars.**
9. **Fruit**—achenes partially persistent, or involucre at least.
10. **Southern and southwestern Colorado** at 3,500' to 5,500'. Palatability to all kinds of stock and game probably very low.



COLORADO BARBERRY



Twig with leaves and spines, x 2

**18. Berberis fendleri**  
Colorado Barberry

1. **Erect shrub** 1'-3' tall, spiny.
2. **Deciduous.**
3. **Twigs** — smooth and shiny as if varnished (except for spines), red-brown, not angled at nodes.
4. **Lenticels** — inconspicuous.
5. **Pith** — round, continuous large.
6. **Buds** — alternate, several scaled, brown.
7. **Leaf scars** — typically 2 (sometimes 3) at a node with stipule, or stipule scars outside the leaf scars.
8. **Bundle scars** — 3. Stipules or stipule scars — present.
9. **Fruit** — berry-like, red, oval, seeds look like wood ticks — berries taken by birds.
10. **Older stems** have bright yellow inner bark and wood.
11. **Southern Colorado** in ponderosa pine zone.

WATER BIRCH



Winter twig with male catkin near tip and persistent central stalk of female catkins near base, x  $\frac{2}{3}$



Glandular excretions on twig, x 7



Leaves, x 1



Winged seed and lobed, ciliate scale, x  $5\frac{1}{2}$

## Key to the More Common Species of *Betula*

1. Low (2'-4') shrubs of bogs; twigs conspicuously gray-glandular .....20. Bog Birch  
**B. glandulosa**  
Tall shrubs or trees of stream banks or slopes;  
glandular excretions not conspicuously different in color from bark ..... 2
2. Stream bank shrubs with older bark brown to reddish .....19. Water Birch  
**B. fontinalis**  
Small trees with older bark white and papery .....21. Paper Birch  
**B. papyrifera**

### 19. *Betula fontinalis*

#### Water Birch, River Birch

1. **A large shrub** or small tree, usually with several slender and freely branched stems.
2. **Deciduous.**
3. **Bark** — smooth, dark, reddish; lenticels conspicuous.
4. **Twigs** — dark reddish brown, often gray with large and prominent glandular excretions, angled at the nodes, spur shoots often present.
5. **Lenticels** — white, present on twigs but often obscured by glandular excretions.
6. **Pith** — small round, continuous, darker than the light colored wood.
7. **Buds** — alternate, brown, several scaled, waxy, pointed.
8. **Leaf scars** — alternate, small, elliptical.
9. **Bundle scars** — 3.
10. **Fruit** — a cylindrical catkin averaging about 1" long and breaking up after maturity, but stems persisting.
11. **Male catkins**  $\frac{1}{8}$ " by  $\frac{3}{8}$ "- $\frac{3}{4}$ " present in winter.
12. **Along streams** in the mountains at lower elevations in Colorado, Wyoming and the Black Hills. Used by beavers; important shade and cover on trout streams.



BOG BIRCH



Winter twig with male catkin and persistent stalk of female catkin, x  $\frac{2}{3}$



Twig sections showing resiniferous excretions, x 7



Leaf and twig, x  $\frac{2}{3}$

## 20. *Betula glandulosa*

### Bog Birch

1. A low to medium sized shrub usually 3'-6' tall.
2. Deciduous.
3. Twigs — grayish brown, densely glandular-resiniferous, not angled at the nodes.
4. Lenticels — obscured on twigs by glandular excretions but enlarging and conspicuous on older stems.
5. Pith — very small, apparently pointed, continuous.
6. Buds — alternate, several scaled, waxy or resinous, dark brown.
7. Leaf scars — alternate, small.
8. Bundle scars — 3.
9. Stipule scars — difficult to see.
10. Fruit — a cylindrical catkin usually not over  $\frac{1}{2}$ " long, breaking up after maturity, the stem persisting.
11. Twigs often with wintergreen flavor.
12. In wet areas and bogs, often with willow, at high elevations — alpine and subalpine, Colorado and Wyoming; ponderosa pine and white spruce zones in Black Hills. Unpalatable to livestock and big game. Buds eaten by grouse and ptarmigan in winter.

PAPER BIRCH



Winter twig  
with male  
catkins, x 1

Female catkin (x  $\frac{2}{3}$ )  
with scales (x  $\frac{2}{3}$ )  
and nutlet (x 3)

Twig portion showing  
lenticels and  
glandular excres-  
cences, x 7



Winter twig with  
persistent stalks of  
female catkins, x  $\frac{2}{3}$



Leaf, x 1

21. *Betula papyrifera*  
Paper Birch

1. **Small to medium-sized tree**, sometimes shrubby.
2. **Deciduous**.
3. **Old bark** — chalky white, peeling into thin layers, with horizontally elongated lenticels.
4. **Twigs** — slender to medium, smooth or somewhat hairy, reddish-brown to gray with resinous excretions, some angled at the nodes, spur shoots often present with leaf scars on them and a terminal bud.
5. **Lenticels** — pale, orange-colored dots becoming horizontally elongated, large and conspicuous on old bark.
6. **Pith** — round or irregularly 3 angled, continuous.
7. **Buds** — alternate, medium-sized, long, ovate, pointed, divergent, brown, resinous; bud scales downy on margins.
8. **Leaf scars** — alternate, 2-ranked.
9. **Bundle scars** — 3.
10. **Stipule scars** — narrow, inconspicuous.
11. **Fruit** — a cylindrical catkin 1"-2" long, breaking up at maturity.
12. **Along streams, valley bottoms and some moist areas on slopes in the Black Hills**. Eaten by mountain goats in Black Hills, but unpalatable to deer in winter.



FENDLER CEANOTHUS



Enlarged twig with leaf, buds and spines, x 4

Key to the More Common Species of *Ceanothus*

1. Evergreen .....24. Snowbrush *Ceanothus*  
*C. velutinus*  
Deciduous ..... 2  
2. Twigs greenish, spiny.....22. Fendler *Ceanothus*  
*C. fendleri*  
Twigs reddish, not spiny .....23. Inland *Ceanothus*  
*C. ovatus*

22. *Ceanothus fendleri*

Fendler *Ceanothus*

1. A low, bushy shrub, spinose (thorny), rarely unarmed, ½' to 2½' tall.
2. Deciduous.
3. Twigs — hairy to glaucous, grayish-green, spiney, not angled at nodes, spur shoots present.
4. Lenticels — inconspicuous.
5. Pith — round, small, continuous, tan or brown.
6. Buds — alternate, several scaled, 3 at a node, light yellow, wooly, pointed, many occurring on spines.
7. Leaf scars — crescent shaped.
8. Bundle scars — 1.
9. No stipule scars.
10. Fruit — a dry, 3 celled capsule, base of dry receptacle persistent.
11. Present but not usually abundant, on open slopes and sparsely timbered areas at low to medium elevations (ponderosa pine zone), of Black Hills, southern Wyoming and Colorado. Palatable to deer and elk.

INLAND CEANOTHUS



Enlarged winter  
twig, x 4



Winter twig with  
persisting base  
of capsule, x 2



Enlarged bud, x 3½



Leaves (two surfaces), x 1½

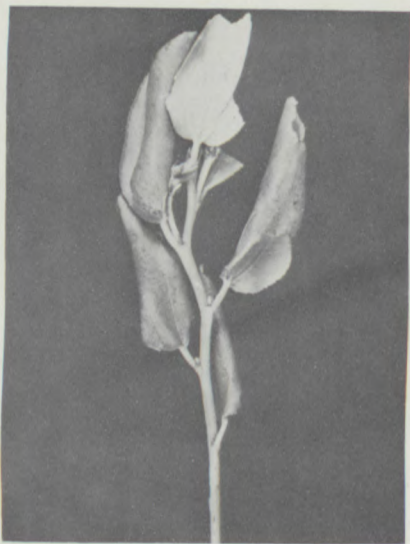
### 23. *Ceanothus ovatus*

#### Inland Ceanothus

1. **Shrub.**
2. **Deciduous.**
3. **Older twigs** — have thin tissue-like bark that peels off easily.
4. **Twigs** — reddish-brown with short fine gray hair, not angled at nodes.
5. **Lenticels** — inconspicuous.
6. **Pith** — round, very small, continuous.
7. **Buds** — alternate, several scaled, dark brown, rounded, wooly at tip.
8. **Leaf scars** — oval, small.
9. **Bundle scars** — 1 or sometimes broken into 3, indistinct.
10. **Stipule scars** — present but small and difficult to see.
11. **Fruit** — 3-celled capsule, bases persisting in saucer-like clusters.
12. **No catkins.**
13. **Once common** in Nebraska sandhills; infrequent in foothills of Colorado and Black Hills. Very palatable to deer and livestock.



SNOWBRUSH CEANOTHUS



Winter twig with leaves, x  $\frac{2}{3}$



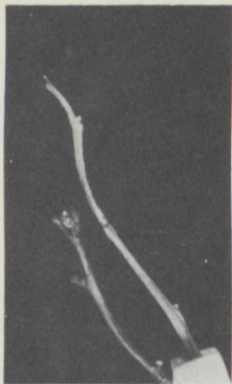
Leaf, x  $\frac{2}{3}$

## 24. *Ceanothus velutinus*

### Snowbrush Ceanothus, Mountain Balm

1. **Shrub 2'-6' tall** with stems reclining; usually in dense clumps or patches.
2. **Evergreen** — leaves alternate, simple, leathery, with 3 principal veins, ovate, large (2"-3" long), shiny dark green on top, margins finely serrulate with black dots.
3. **Twigs** — green, hairy, angled at nodes.
4. **Lenticels** — inconspicuous.
5. **Pith** — round, continuous.
6. **Buds** — alternate, several scaled, hairy, green.
7. **Leaf scars** — alternate, oval.
8. **Bundle scars** — 3.
9. **Stipule scars** — present — stipules sometimes persistent.
10. **Fruit** — clusters of 3-celled capsules — bases of which persist.
11. **No catkins.**
12. **Characteristic sweet penetrating odor.**
13. **Mountain sides and ridges** at medium and high elevations — Colorado, Wyoming, Black Hills. Very good fall and early winter deer food.

AMERICAN BITTERSWEET



Winter twigs with spur shoots, x  $\frac{2}{3}$



Enlarged stem and bud, x 2



Leaves and  
fruits, x  $\frac{2}{3}$

## 25. *Celastrus scandens*

### American Bittersweet

1. **Vine without tendrils.** Sometimes appearing like a short single-stemmed shrub where support for climbing is absent.
2. **Deciduous.**
3. **Twigs** — smooth, light gray to brown, not angled at nodes, spur shoots present.
4. **Lenticels** — inconspicuous.
5. **Pith** — round, large, white, continuous.
6. **Buds** — alternate, several-scaled, tan, blunt cone-shaped, at right angle to twigs.
7. **Leaf scars** — half round to triangular.
8. **Bundle scars** — 1.
9. **No stipule scars.**
10. **Fruit** — a bright orange-red, globular, dehiscent capsule; persistent, ornamental.
11. **No catkins.**
12. **Black Hills and Nebraska** along streams and adjacent hillsides, not abundant. Palatable to deer and birds.



HACKBERRY



Enlarged bud and  
leaf scar, x 7



Fruits, x  $\frac{2}{3}$



Winter twig, x  $\frac{2}{3}$



Leaves and fruit, x  $\frac{1}{4}$



Twig section showing  
chambered pith, x 7

26. *Celtis occidentalis*  
Hackberry

1. **Large shrub** or small tree.
2. **Deciduous.**
3. **Old bark**—with narrow, steep-sided, layered ridges; roughened by irregular, wartlike excrescences.
4. **Twigs**—slender, olive to medium brown, sparingly pubescent, not angled.
5. **Lenticels**—small, white, elongate.
6. **Pith**—white, round, interrupted with partitions with or without cavities (fast growing twigs may show all continuous pith).
7. **Buds**—alternate, light brown, plump, short, hairy on two sides; tips appressed; no terminal bud.
8. **Leaf scars**—alternate, small, elliptical.
9. **Bundle scars**—3.
10. **Stipule scars**—present.
11. **Fruit**—globular, berry-like in appearance, but with a relatively large hard stone, on a long pedicle, red to dark purple. Eaten by birds.
12. **No catkins.**
13. **Scarce**—usually on dry south slopes at lower elevations, Colorado, Wyoming, and Nebraska. Hackberry groves are most important nesting trees for blue herons in Nebraska sandhills. Relatively unpalatable to game and livestock.

CURLEAF MOUNTAIN MAHOGANY



Twig with leaves  
and fruit, x  $\frac{1}{2}$

Key to the More Common Species of *Cercocarpus*  
Evergreen, leaves firm,  
revolute, entire.....27. Curlleaf Mountain Mahogany

*C. ledifolius*

Deciduous, leaves not firm, not revolute, toothed  
at least at apex.....28. True Mountain Mahogany

*C. montanus*

### 27. *Cercocarpus ledifolius*

#### Curlleaf Mountain Mahogany

1. **Shrub up to 15' tall** (sometimes reaching size of small tree).
2. **Evergreen**—the leaves simple, lanceolate to elliptical, 1" to 2" long, revolute and entire, rather rigid, thick, leathery, shiny dark green above, whitish below (sometimes hairy).
3. **Old bark**—grayish to brownish, thin and scaly.
4. **Twigs**—round, rather slender, commonly forming spur shoots, covered with deciduous long hairs, red brown, not angled at nodes.
5. **Lenticels**—inconspicuous.
6. **Pith**—very small, rounded, continuous.
7. **Buds**—alternate, sessile, round.
8. **Leaf scars**—alternate, small and narrow, on older twigs crowded and elevated.
9. **Bundle scars**—3.
10. **Stipules**—an inconspicuous narrow line, or missing.
11. **Fruit**—sometimes persistent in the cylindrical receptacle—a tan colored achene with a long (1½"-3") villous tail.
12. **Foothills** in western section of Colorado and in Wyoming; important big game browse where abundant. Another species, *C. intricatus*, occurs less commonly in extreme western Colorado. It is a shrub with linear leaves which are strongly revolute.



TRUE MOUNTAIN MAHOGANY



Enlarged twig, x 4



Winter twig, x 2

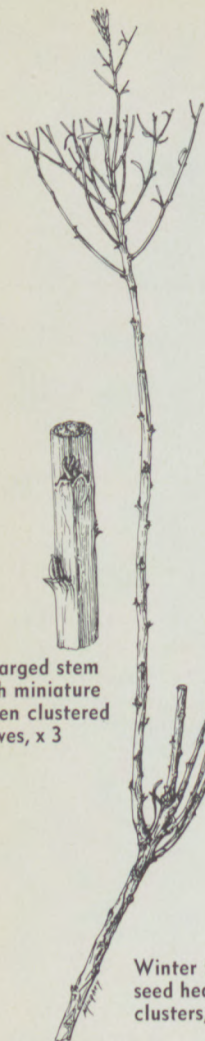


Branch with leaves,  
x 1/2

28. *Cercocarpus montanus*  
True Mountain Mahogany

1. **Shrub** 4'-7' tall.
2. **Deciduous**.
3. **Old bark** — grayish-brown to blackish marked by longitudinal fissures.
4. **Twigs** — hairy, medium-brown, not angled at nodes, spur shoots usually present.
5. **Lenticels** — conspicuous on second year twigs, somewhat obscured on new twigs.
6. **Pith** — 5-pointed, continuous.
7. **Buds** — alternate, several-scaled, fuzzy at tip, red-brown.
8. **Leaf scars** — crescent shaped.
9. **Bundle scars** — 3.
10. **Stipule scars** — small, obscured by hairs.
11. **Fruit** — an achene with long (2"-3") villous tail; sometimes persistent in the cylindrical receptacle.
12. **Very important browse plant** for game and livestock. Occurs commonly throughout Central Rocky Mountain area in pinon-juniper, ponderosa pine and Douglas fir zones.

RABBITBRUSH



Enlarged stem  
with miniature  
green clustered  
leaves, x 3

Enlarged flower,  
x  $3\frac{1}{2}$



Summer twig with  
leaves, x  $\frac{2}{3}$



Enlarged flower  
head bracts with  
blunt, glandular  
tips, and in  
four vertical rows,  
x  $3\frac{1}{2}$

Winter twig with branched  
seed head and flat-topped  
clusters, x  $\frac{2}{3}$

29. *Chrysothamnus* spp.  
Rabbitbrush

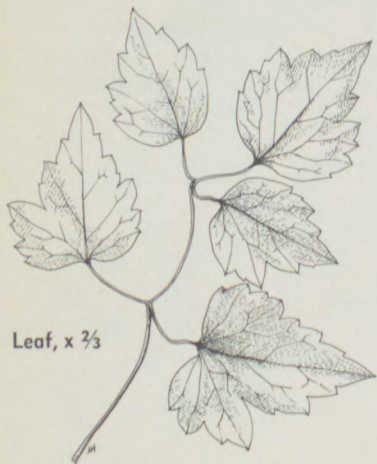
1. Shrubs 1' to 6' tall.
2. Deciduous.
3. Twigs — round, not angled at nodes, often ridged, glabrous or very hairy, white to greenish.
4. Lenticels — not apparent.
5. Pith — continuous.
6. Buds — small, hidden, alternate, green.
7. Leaf scars — alternate.
8. Bundle scars — 3.
9. No stipule scars.
10. Fruit — achenes small and with a pappus of capillary bristles: dried inflorescences persistent.
11. Odor — has a strong characteristic odor.
12. Occurrence — throughout Central Rocky Mountain area, in valley bottoms and foothills, often on alkaline soils. Important food of cottontail rabbits. Palatable to deer, elk and livestock.



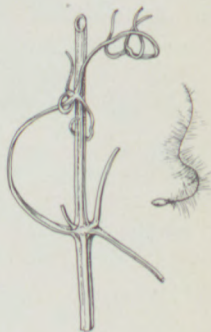
WESTERN VIRGINSBOWER



Stem and bud, x 1½



Leaf, x 2/3



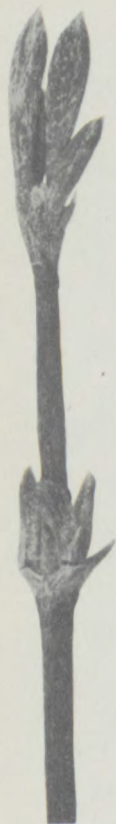
Stem with tendrils,  
fruit, x 1

### 30. *Clematis ligusticifolia*

#### Western Virginsbower

1. **Vine** — the stems trailing or climbing extensively.
2. **Leaves** — opposite, compound; the leaflet deciduous but the petioles and petiolules persistent and tendril-like, aiding the plant to climb. Strong transverse connecting ridge present, nodes enlarged.
3. **Canes**, slender, flexible, light brown to cream-colored, striate or ribbed longitudinally with 6 ridges.
4. **Lenticels** — not evident.
5. **Pith** — 6-pointed, white, satiny, continuous.
6. **Buds** — wide and short, light brown, white hairy, the hairs much thicker toward the tip of the bud. Bud scales opposite, in pairs.
7. **No stipule scars.**
8. **Fruit** — achenes in clusters, with long hairy tails.
9. **Along creeks and canyons** at lower elevations throughout Central Rocky Mountain region. Furnishes cover for birds.

BLACKBRUSH



Enlarged winter  
twig and buds, x 4



Twig with leaves (fall), x 2

31. *Coleogyne ramosissima*  
Blackbrush

1. Diffusely branched, somewhat spinescent desert shrub, up to 6' tall.
2. Deciduous.
3. Twigs — short, rigid, hairy towards tip (hairs attached by middle); tan-colored, older bark gray; not angled at nodes; spur shoots present.
4. Lenticels — inconspicuous.
5. Pith — round continuous, very small, darker than wood.
6. Buds — opposite, small, green, hairy.
7. Leaf scars — opposite.
8. Bundle scars — indistinct.
9. Stipules — persistent, conspicuous, opposite; united into a sheath-like, hairy, elevated cover over the leaf bases.
10. Fruit — an achene, somewhat compressed, the obtuse apex incurved.
11. Generally scarce in southwestern Colorado (abundant on Dolores River); sandy, desert soils; taken by sheep on winter range.



REDOSIER DOGWOOD

Enlarged twig and buds, x 4



Winter twig,  
x  $\frac{2}{3}$



Leaves, x  $\frac{2}{3}$



Stolon or trailing shoot with roots at node, x  $\frac{2}{3}$

### 32. *Cornus stolonifera*

Redosier Dogwood, Kinnikinnick

1. **Low to medium-sized shrub** 3'-6' tall.
2. **Deciduous.**
3. **Twigs** — slender to medium, usually dark red to purplish red — rarely yellow, sparsely to moderately hairy, not angled at nodes, often ridged.
4. **Lenticels** — usually conspicuous, rounded, raised, gray, enlarging on older bark.
5. **Pith** — round, white, satiny, continuous.
6. **Buds** — opposite, bud scales one pair, long-taper-pointed, red gray — hairy, stalked, flower buds swollen near base; petiole bases usually persistent about the terminal bud.
7. **Leaf scars** — opposite, comparatively large, narrow, constricted between the large bundle scars; transverse connecting ridge usually present.
8. **Bundle scars** — 3, prominent.
9. **No stipule scars.**
10. **Fruit** — clusters of white or gray berry-like drupes — taken by birds and bear.
11. **Taste** — bitter.
12. **Along streams and canyon bottoms** throughout Rocky Mountain Region. Palatable to deer, elk and to a lesser extent livestock.

FILBERT or HAZEL



Winter twig, x 1



Enlarged terminal bud, x 3½



Leaves, x ½



Leaf and nut with involucre, x ½



Enlarged twig with bud and male catkins, x 4

### 33. *Corylus cornuta*

Filbert (Hazel)

1. **Low to medium-sized shrubs** 2'-10' tall.
2. **Deciduous.**
3. **Twigs**—light brown, regularly checkered, often angled at nodes.
4. **Lenticels**—not evident.
5. **Pith**—small, round, continuous, darker than wood.
7. **Buds**—alternate, several scaled, hairy at scale margins, dark brown except light-colored tip.
8. **Leaf scars**—alternate, somewhat raised, half round.
9. **Bundle scars**—3 or multiplied and finally obscured.
10. **Stipule scars**—prominent, sometimes wider than leaf scars.
11. **Fruit**—a nut with an involucre—typical filbert or hazel nut, edible.
12. **Male catkins present**, laterally along twigs.
13. **Moist areas in valley bottoms** and on slopes, scarce along front range in Colorado and abundant locally in the Black Hills. Unpalatable as a browse in winter but fruits taken by deer and birds.



CREOSOTE BUSH



Branch with leaves and fruits, x  $\frac{2}{3}$



Leaf, x  $1\frac{1}{2}$



Twig section with  
2-scaled bud and  
large, persistent  
stipules, x  $1\frac{1}{2}$

### 34. *Covillea tridentata*

(*Larrea divaricata*)

Creosotebush

1. **Diffusely branching shrubs**, 3'-11' tall.
2. **Evergreen** — the compound leaves with two, thick, resinous, short-petioled leaflets each of which is loosely folded and oblong.
3. **Twigs** — 4-angled, becoming round in age with short internodes; small to medium sized in cross section.
4. **Pith** — 4-sided, continuous.
5. **Lenticels** — inconspicuous.
6. **Buds** — small, ovoid, with 2 scales, sessile, usually imbedded in balsam.
7. **Leaf scars** — opposite, somewhat raised, minute, round.
8. **Bundle scars** — 1, usually concealed by balsam.
9. **Stipules** — persistent, large, brown.
10. **Fruit** — long-hairy, 5-seeded, indehiscent capsules.
11. **Odor** — strong, resembling creosote.
12. **A dominant species of the southwestern dry mesas** from New Mexico to California; may occur in south or southwestern part of Colorado. Palatability — very low for either livestock or big game.

STANSBURY CLIFFROSE



Enlarged twig showing leaves, buds, stipules, x 4

### 35. *Cowania stansburiana*

#### Stansbury Cliffrose

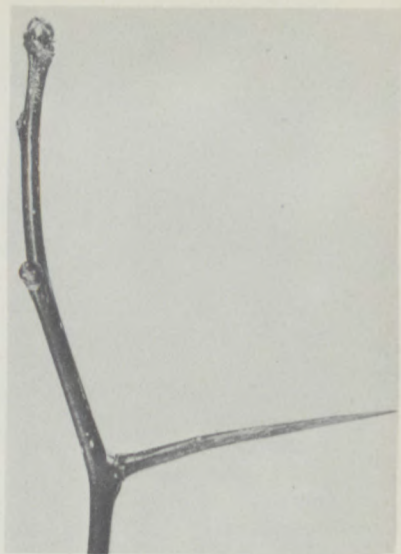
1. **Low to medium-sized**, much-branched shrub 2'-4' tall.
2. **Evergreen** — the leaves small, usually 5-lobed, glandular-dotted.
3. **Old bark** — shreddy, light-colored.
4. **Twigs** — sticky, glandular, hairy at nodes, red-brown, not angled at nodes, spur shoots present.
5. **Lenticels** — inconspicuous.
6. **Pith** — 5-pointed, dark colored, hollow spongy.
7. **Buds** — true winter buds not present.
8. **Leaf scars** — alternate.
9. **Stipules** — persistent, encircling twig.
10. **Fruit** — one seeded carpels, usually in fives, with long hairy tail.
11. **Characteristic pungent odor** and bitter taste. Stickiness distinguishes it from bitterbrush.
12. **Found rarely in low hills and canyons**, southwestern Colorado. A good deer food where it occurs.



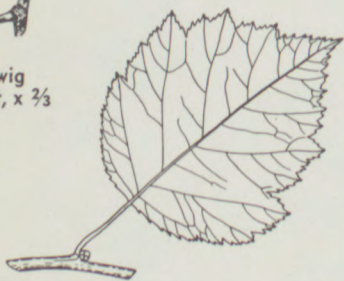
HAWTHORN



Winter twig  
with fruit, x  $\frac{2}{3}$



Winter twig with thorn, x  $1\frac{1}{2}$



Leaf, x  $1\frac{1}{2}$



Enlarged stem  
and buds, x 2

### 36. *Crataegus* spp.

#### Hawthorn

1. **Medium to large shrub**, sometimes tree-like.
2. **Deciduous** — leaves alternate (thorns in the axils of the leaves).
3. **Old bark** — dark, scaly.
4. **Twigs** — smooth reddish brown to grayish, rigid, often with long shiny, reddish thorns, angled at nodes.
5. **Lenticels** — prominent, white, oval.
6. **Pith** — round, white, continuous.
7. **Buds** — short, plump, rounded, shiny, red except for gray scale margins, several bud scales.
8. **Leaf scars** — alternate, relatively narrow, crescent-shaped.
9. **Bundle scars** — 3, not conspicuous.
10. **Stipule scars** — not evident.
11. **Fruit** — a small pome, persisting in winter. Eaten by birds.
12. **Along creeks and valley bottoms** throughout Rocky Mountain region. Not very palatable, and usually not heavily browsed under proper range use, but important for bird food.

DRYAD, ALPINE AVENS



Whole plant in summer condition, x 1

### 37. *Dryas octopetala*

Dryad, Alpine Avens

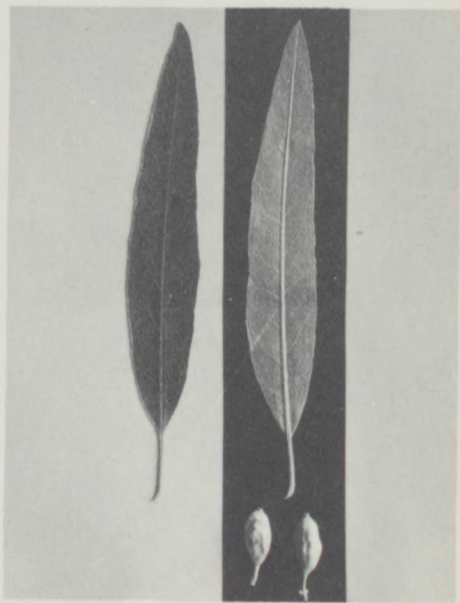
1. **Alpine shrub** — low, depressed and matted.
2. **Deciduous.**
3. **Leaves** —  $\frac{1}{4}$ "-1" long, oblong to elliptic-oblong, obtuse at apex, rounded or subcordate at base, glabrate and dull above, white-tomentose beneath, veins coarsely conspicuous, impressed above, margins coarsely crenate and somewhat revolute. Petioles nearly as long as blades, sheath-like at base, the sheath persistent also many old leaves in mat.
4. **Twigs** — very short or decumbent, outer bark peeling, brown.
5. **Pith** — small, brown, continuous.
6. **No true winter buds.**
7. **No leaf scars, bundle scars, or stipule scars.**
8. **Inflorescence** — persistent with long scape, dry receptacle, and elongated plumose style.
9. **High mountains** — 11,000'-14,000'. Presumably palatable to limited extent to big game.



RUSSIAN OLIVE



Winter twig, x 1



Leaves (two surfaces) and fruits, x 1

## Key to the More Common Species of *Elaeagnus*

Twigs glabrous or silvery, scurfy, scaly;

buds yellow-green .....38. Russian Olive  
**E. angustifolia**

Twigs with copper colored peltate scales;

buds copper colored .....39. Silverberry  
**E. commutata**

### 38. *Elaeagnus angustifolia*

#### Russian Olive

1. **Small tree** — often shrubby.
2. **Deciduous.**
3. **Twigs** — scurfy gray or shiny red-brown, often spiny, sometimes angled at nodes.
4. **Lenticels** — inconspicuous.
5. **Pith** — irregular, continuous.
6. **Buds** — alternate, several scaled, wooly, tan, rounded, single or in pairs.
7. **Leaf scars** — oval, raised.
8. **Bundle scars** — 1.
9. **No stipule scars.**
10. **Fruit** — drupe-like, similar to silverberry, but the stone rounded at the ends. Eaten by birds. Fruit stems persist on twig. Seed covered by sweet mealy flesh.
11. **Introduced** — used as an ornamental or windbreak; useful in erosion control and as food and shelter for small game and birds at lower elevations. Fairly palatable to deer and elk.

SILVERBERRY



Enlarged twig  
and bud, x 4



Winter twig, x 2



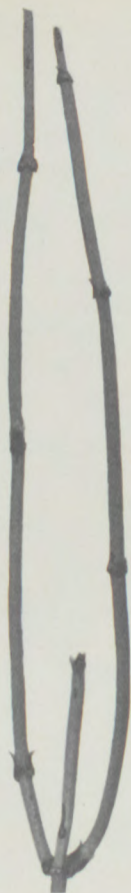
Leaves (two surfaces), x 1½

39. *Elaeagnus commutata*  
Silverberry .

1. **Medium to tall stoloniferous shrub**, 3'-12' tall.
2. **Deciduous**.
3. **Twigs**—with thorns at the ends, or with spur-like branches ending in thorns, with or without lateral thorns; young twigs brownish or silvery with scurfy scales, becoming silvery.
4. **Lenticels**—not evident.
5. **Pith**—irregular, continuous, light brown, darker than greenish wood.
6. **Buds**—silvery gray, naked—without true winter scales.
7. **Leaf scars**—alternate, half round or crescent-shaped.
8. **Bundle scars**—1.
9. **Stipule scars**—none.
10. **Fruit**—drupe-like with an 8-striate, football-shaped stone tapered at ends. Eaten by birds. Quite dry and pithy or mealy to the taste.
11. **Moist sandy swales and banks** at lower elevations; scarce except in northern Wyoming. May be valuable for gully erosion control. Fruits and young stems occasionally taken by deer.



EPHEDRA



Enlarged twig with leaves  
and one terminal bud, x 2

#### 40. *Ephedra* spp.

##### *Ephedra*, Jointfir, Mormon Tea

1. Scraggly shrubs with numerous "equisetum-like" branches.
2. Technically evergreen; brown scale-like leaves are persistent, opposite or in whorls of 3.
3. Old bark — gray to brown.
4. Twigs — yellow-green, finely striate and usually granular, elongated, straight and slender.
5. Lenticels — none.
6. Pith — round to scalloped, red-brown, resinous, continuous except for firm, pale diaphragms at the nodes.
7. Buds — two or three at a node, sessile, ovoid, small, white. Flower buds collaterally multiple.
8. Fruit — thin scaled "cones" (nut-like in appearance).
9. Taste — like strong tea — bitter.
10. Occurrence — foothills up into ponderosa pine zone on the western slope in Colorado and in southwestern Wyoming. Palatability — browsed by deer on heavily used winter ranges.

ERIOGONUM



Twigs, leaves, fruit and flower  
(*E. heracleoides*), x  $\frac{2}{3}$ . Enlarged  
flower, x 7

Twigs, leaves, flower  
(*E. microthecum*), x  $\frac{2}{3}$ .  
Enlarged flower, x 7

41. **Eriogonum spp.**

Eriogonum, Buckwheatbrush

1. **Low shrubs.**
2. **Deciduous**, some (perhaps the half-shrubs) are evergreen.
3. **Twigs**, wooly, brown, not angled at nodes.
4. **Lenticels** — inconspicuous.
5. **Pith** — 5 pointed, dark brown, continuous.
6. **Buds** — alternate, hidden behind persistent leaf bases.
7. **Leaf scars** — much raised.
8. **No stipule scars.**
9. **Common**, but not generally abundant, throughout Rocky Mountain region at low and medium elevations.



COMMON WINTERFAT



Winter twig with  
persistent leaves, x 1



Enlarged twig tip  
with leaves, x 2

42. *Eurotia lanata*  
Common Winterfat

1. Usually a low shrub but occasionally up to 3' tall.
2. Evergreen.
3. Twigs — slender, very hairy, gray to white, not angled at nodes.
4. Lenticels — not evident.
5. Pith — irregular, bright green, continuous.
6. Buds — alternate — not true winter buds.
7. Leaf scars — oval, raised.
8. Bundle scars — 1.
9. No stipule scars.
10. Fruit — a small plump seed covered by long silvery-white hairs.
11. Taste — dry but slightly sweet.
12. Most common in low plains and valleys. It is a palatable, nutritious species, increasing in early stages of heavy livestock grazing — later becoming scarce if grazing pressure continues.

APACHE PLUME



Branch with twigs, leaves,  
flowers, fruits, x  $\frac{1}{4}$

43. **Fallugia paradoxa**  
Apache Plume

1. **Low to medium-sized shrub**, much branched.
2. **Deciduous to semi-evergreen**. Partly formed leaves often present at the growing points during winter.
3. **Bark** — whitish or pale-gray.
4. **Twigs** — slender, white, sparsely hairy.
5. **Lenticels** — inconspicuous.
6. **Pith** — round, continuous.
7. **Buds** — sessile, alternate, several-scaled, hairy, gray.
8. **Fruits** — dry one-seeded carpels with long villous tail; receptacles persistent.
9. **Very sparse occurrence** in southern Colorado; moderate to fair palatability for sheep and goats.



CLIFF FENDLERBUSH



Winter twig with persistent  
fruit capsules, x 1



Twig segment  
with leaves, x 1

#### 44. *Fendlera rupicola*

##### Cliff Fendlerbush

1. **Erect** intricately branched shrubs.
2. **Deciduous**.
3. **Twigs** — round, striate, hairy, gray to tan, not angled at nodes, spur shoots present.
4. **Lenticels** — inconspicuous.
5. **Pith** — round, continuous.
6. **Buds** — small, hidden beneath enlarged persistent leaf bases.
7. **Leaf scars** — opposite.
8. **No stipule scars**.
9. **Fruit** — a persistent, dry several seeded capsule; sepals persistent, fused to the capsule for about  $\frac{1}{3}$  its length, then divergent.
10. **Southwestern Colorado**; palatable to deer and livestock.

NEW MEXICAN FORESTIERA



Winter twig, x 2



Branch with leaves and fruits, x 1½

#### 45. *Forestiera neomexicana*

New Mexican *Forestiera*, Coyotebush

1. **Shrub 3'-9'** tall.
2. **Deciduous.**
3. **Twigs** — gray-brown, rarely hairy, sometimes spiney, not angled at nodes, spur shoots present, branches minutely warty.
4. **Lenticels** — conspicuous.
5. **Pith** — light green to white, continuous.
6. **Buds** — opposite, imbricated — scaly, often superposed, 4 ranked, light tan.
7. **Leaf scars** — reniform.
8. **Bundle scars** — not evident.
9. **No stipule scars.**
10. **Fruit** — clusters of small dark blue or purplish drupes on short stems; bitter.
11. **Southwest Colorado**; probably unpalatable to both game and livestock.



SPINY GREASEBUSH



Winter twig, x  $\frac{2}{3}$



Enlarged leaf, x 2



Branch with twigs, leaves  
and spines, x  $\frac{1}{4}$

46. *Forsellesia spinescens*  
Spiny Greasebush

1. **Small shrub.**
2. **Deciduous**, leaves glaucous.
3. **Older bark** — yellowish gray, peeling into flakes, loose at ends, attached in middle.
4. **Twigs** — gray-green, sometimes with blunt spines, flat-ridged below leaf scars.
5. **Pith** — small, round, white, continuous.
6. **Buds** — alternate, 2-3 scaled, small.
7. **Leaf scars** — alternate, narrowly triangular to crescent-shaped, petioles at first persisting and covering buds.
8. **Stipules absent.**
9. **Fruit** — a follicle.
10. **Uncommon in southern and western Colorado.** Another species, *F. meionandra* occurs in west central and southwestern Colorado. This plant has stipules and leaves are pubescent; otherwise very similar to *F. spinescens*.

SINGLELEAF ASH



Winter twig, x 1½



Leaf and fruit, x 1½

47. **Fraxinus anomala**  
Singleleaf Ash

1. Shrub or small tree 3'-15' tall.
2. Deciduous.
3. Old bark — dark brown slightly tinged with red,  $\frac{1}{4}$ " thick and divided by shallow fissures into narrow ridges separating into small, thin, appressed scales.
4. Twigs — smooth, light brown, not angled at nodes, spur shoots present.
5. Lenticels — pale, inconspicuous.
6. Pith — 4-angled, continuous.
7. Buds — opposite, covered by orange tomentum, dark brown or black, usually rough and dry, several-scaled, in opposite pairs.
8. Leaf scars — circular to horseshoe-shaped.
9. Bundle scars — numerous in an arc-shaped row.
10. No stipule scars.
11. Fruit — a simple samara.
12. Southwestern Colorado at lower elevations, either in the neighborhood of streams or on dry hillsides.



GREEN ASH



Winter twig, x 1



Leaf and fruits, x ¼

48. *Fraxinus pennsylvanica* var. *lanceolata*

Green Ash

1. Usually a small to medium-sized tree.
2. Deciduous.
3. Old bark — gray, furrowed.
4. Twigs — medium to coarse, light brown, swollen at nodes.
5. Lenticels — prominent, white.
6. Pith — round, white, continuous.
7. Buds — wide, short, blunt, chocolate or rusty brown, rough, one pair of outer valvate scales showing.
8. Leaf scars — alternate, half-round.
9. Bundle scars — in an arc-shaped row.
10. No stipule scars.
11. Fruit — a simple samara.
12. Along rivers and creeks at low elevations (below mountains) in Wyoming, Black Hills, and Nebraska. Not especially palatable.

WESTERN WINTERGREEN



Whole plant with fruits, x 1

#### 49. *Gaultheria humifusa*

##### Western Wintergreen

1. **Low, procumbent shrubs** forming loose mats.
2. **Evergreen.**
3. **Leaves**—oval to round,  $\frac{1}{4}$ "- $\frac{3}{4}$ " long, short-stemmed, margins nearly entire, glabrous to slightly pilose.
4. **Twigs**—fine, delicate and round, beset with small scale-like ciliated, undeveloped leaves— not to be confused with true leaves or with persistent bud scales.
5. **Pith**—half of the diameter of the twig, continuous, spongy.
6. **Buds**—alternate, sessile, ovoid, with about 5 ciliate scales.
7. **Leaf scars**—minute, crescent-shaped, difficult to find.
8. **Bundle scars** and stipule scars lacking.
9. **Fruit**—a globose, berry-like capsule enclosed in a scarlet, fleshy calyx.
10. **Fairly common** in central and north central Colorado and Wyoming at 10,000' to 11,500'. Palatable to big game and the fruits to grouse and ptarmigan.



SPINY HOPSAGE



Winter twig, x 1  
Enlarged naked bud, x 8

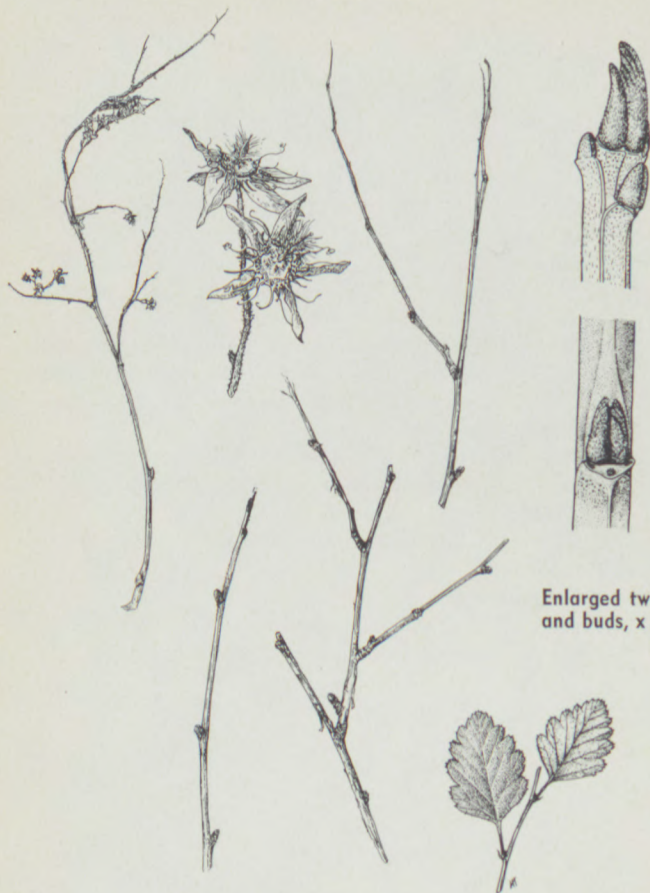


Twig with leaves, x 1  
Enlarged fruit, x 2

50. *Grayia spinosa*  
Spiny Hopsage

1. Shrub 1'-3' tall.
2. Deciduous.
3. Bark — gray to reddish-brown; older bark forming linear white striations.
4. Twigs — slightly scurfy or mealy, frequently spinescent, light gray, not angled at nodes, with many spur shoots; branches forking at about 30 degrees.
5. Lenticels — inconspicuous.
6. Pith — with many (7+) points, white, continuous.
7. Buds — alternate, cauliflower-like, glaucous, white, rounded.
8. Leaf scars — alternate, small, raised.
9. Bundle scars — 1.
10. No stipule scars.
11. Scarce; alkaline soils at lower elevations, western Colorado; palatable to livestock, and probably deer.

BUSH ROCKSPIREA



Winter twigs, x 1.  
Enlarged, persistent,  
flower, x 7

Enlarged twig  
and buds, x 3½

Leaves, x 2/3

51. **Holodiscus dumosus**

Bush Rockspirea

1. Shrub 2'-5' tall.
2. Deciduous.
3. Older bark — splitting longitudinally, shreddy, gray.
4. Twigs — very slender, prominently ridged between nodes, light brown, very hairy towards tips, not angled at nodes.
5. Lenticels — inconspicuous.
6. Pith — 5-pointed, continuous, salmon-colored in old stems.
7. Buds — alternate, several scaled, very hairy, gray.
8. Leaf scars — narrow, crescent-shaped.
9. Bundle scars — 3.
10. No stipule scars.
11. Fruits — small, dry, 1-seeded, hairy carpels; dried inflorescences persisting.
12. Rocky ridges and slopes in lower and medium elevations in Colorado; unpalatable.



CLIFF JAMESIA



Twig with leaves and fruits, x 1½



Enlarged winter twig, x 2

52. *Jamesia americana*  
Cliff Jamesia, Cliffbush

1. Shrubs 3'-6' tall.
2. Deciduous.
3. Inner bark — split into white longitudinal bands; outer bark reddish brown.
4. Twigs — rounded or slightly 4 angled, hairy, with quickly exfoliating bark, not angled at nodes; twigs typically curved with laterals often exceeding terminal in length.
5. Lenticels — inconspicuous.
6. Pith — moderate, rounded to 6-pointed, pale brown or orange-streaked, continuous.
7. Buds — opposite, sessile with 1 pair of white-hairy scales; the terminal rather large, the lateral small or suppressed.
8. Leaf scars — opposite, narrowly U-shaped, white-ciliate, meeting around twig.
9. Bundle scars — 3, small.
10. Stipule scars — none.
11. Dried capsules persisting.
12. Occurrence — especially on steep, rocky slopes in pinon-juniper, ponderosa pine, and open Douglas fir types in Colorado and Wyoming — probably east of Continental Divide; not palatable to big game or livestock.

BOG KALMIA



Leaves, x 1½

Whole plant with stems,  
leaves and fruits, x ½

53. *Kalmia polifolia* (var. *microphylla*)

Bog *Kalmia*

1. Diffusely branching shrubs, not over 1' high.
2. Evergreen.
3. Leaves —  $\frac{1}{4}$ "- $\frac{3}{4}$ " long, opposite, sessile, oblong or linear-oblong, the edges strongly revolute, entire, glaucous white beneath, dark green above.
4. Twigs — very slender, not angled.
5. Lenticels — inconspicuous.
6. Pith — small, round, continuous.
7. Buds — minute, opposite, 2-scaled, sessile.
8. Leaf scars — somewhat clustered toward anterior end of season's growth, opposite, crescent-shaped, usually raised, pairs almost connecting transversely.
9. Bundle scars — thin transverse line or indistinguishable.
10. Stipule scars — lacking.
11. Fruit — a 5-celled sub-globose capsule, persistent in winter.
12. Uncommon throughout alpine areas of north central Colorado and Wyoming at 9,000'-11,500' in moist places. Poisonous to livestock, especially sheep. Fruit may be palatable to grouse, ptarmigan, and small mammals.



BEARBERRY HONEYSUCKLE



Winter twig with  
fruits persisting,  
x  $\frac{2}{3}$



Enlarged buds, x  $3\frac{1}{2}$



Fruit, bracts and bractlets, x  $\frac{2}{3}$



Leaves, x  $\frac{1}{2}$

#### 54. *Lonicera involucrata*

##### Bearberry Honeysuckle

1. Erect to spreading shrub usually 2'-5' tall.
2. Deciduous.
3. Older bark — shredding longitudinally.
4. Twigs — medium sized, cream-colored or tan, somewhat flattened or ridged, not angled at nodes, transverse connecting ridge present.
5. Lenticels — inconspicuous.
6. Pith — 6 angled, white, continuous to spongy.
7. Buds — opposite, several-scaled, light brown.
8. Leaf scars — opposite, medium width, raised, V-shaped.
9. Bundle scars — 3.
10. Stipule scars — present.
11. Fruit — pairs of juicy black berries, subtended by leafy bracts, rarely persisting into winter, berries eaten by birds and animals. Bitter tasting.
12. Stream banks and moist situations at medium and high elevations throughout central Rocky Mountain region. Not especially palatable.

FREMONT MAHONIA



Branch with buds, leaves and fruits, x  $\frac{1}{2}$

## Key to the Species of *Mahonia*

- Leaf scars wide, nearly circular; main stem internodes elongated; reaching 4' or more .....55. Fremont *Mahonia*  
*M. fremonti*
- Leaf scars narrow; stem growth in nature of spur shoot (short internodes) less than 1' high .....56. Creeping *Mahonia*  
*M. repens*

### 55. *Mahonia fremonti*

#### Fremont *Mahonia*

1. **An erect evergreen shrub 2'-6' tall.** Similar to *M. repens* in most respects except height.
2. **Leaves** — alternate — pinnately compound with 2-3 pairs of leaflets, the lowest pair close to the base of the petiole and spiny.
3. **Twigs** — roundish, relatively stout, older branches having stringy gray bark.
4. **Lenticels** — inconspicuous.
5. **Pith** — comparatively large, irregular, pale, continuous.
6. **Buds** — green, rather small except for the terminal one which is ovoid with about 6 scales; old bud scales persistent.
7. **Leaf scars** — oval, elevated.
8. **Bundle scars** — inconspicuous.
9. **No stipules.**
10. **Fruit** — cluster of blue or purple berries, not persistent.
11. **Wood** — bright yellow just under the bark, otherwise light yellow or cream.
12. **Occurs** in canyons and on dry slopes of southwestern Colorado.



CREeping MAHONIA



Leaves and fruits, x  $\frac{1}{4}$



Twig, x 1



Twig, buds and leaves, x  $\frac{2}{3}$

## 56. *Mahonia repens*

### Creeping Mahonia, Creeping Hollygrape, Oregon Grape

1. **Low shrubs** mostly 4"-12" tall, sparingly branched, the stems trailing or sub-erect.
2. **Evergreen** — the leaves alternate — pinnately compound with 3-7 leaflets; the leaflets firm, dark green or often red or purplish in winter, spiny-toothed as in holly.
3. **Twigs** — roundish, relatively stout, smooth, glaucous.
4. **Lenticels** — inconspicuous.
5. **Pith** — comparatively large irregular, pale, continuous.
6. **Buds** — green, rather small except for the terminal one which is ovoid with about 6 scales.
7. **Leaf scars** — narrow, low, half-encircling the stem.
8. **Bundle scars** — about 9.
9. **No stipules.**
10. **Fruit** — cluster of blue or purple berries, not persistent.
11. **Wood** — bright yellow just under bark, otherwise light yellow or cream.
12. **Occurs throughout central Rocky Mountain region** in foothills and mountains, in mountain shrub, aspen, ponderosa pine and Douglas fir types. Very palatable to deer and elk; not especially to cattle.

AMERICAN HOPHORNBEAM



Winter twig with buds and  
staminate catkins, x  $\frac{2}{3}$



Leaves, x  $\frac{2}{3}$

## 57. *Ostrya virginiana*

American hophornbeam, Ironwood

1. **Small tree** in central Rocky Mountain area.
2. **Deciduous** — dead leaves often persisting into the winter.
3. **Old bark** — thin, flaky, grayish-brown, broken into flattish pieces, loose at the ends.
4. **Twigs** — rather slender, pubescent, reddish brown to light brown.
5. **Lenticels** — scattered, pale.
6. **Pith** — small continuous.
7. **Buds** — small, narrowly ovate, pointed, light reddish brown, usually pubescent, divergent; scales several — often striate.
8. **Leaf scars** — alternate, 2 ranked, small, elliptical.
9. **Bundle scars** — 3 or 5 inconspicuous.
10. **Stipule scars** — triangular, rather inconspicuous.
11. **Fruit** — small, seed-like nutlet in an inflated sac-like bract, the fruits in a hop-like cluster.
12. **Staminate catkins** present — these small and cylindrical.
13. **Present along canyon bottoms and moist areas** in sections of the Black Hills. Unpalatable and not important as a browse.



PRICKLY OXYTENIA



Branch with leaves and flower heads (fall), x  $\frac{1}{4}$

## 58. *Oxytenia acerosa*

### Prickly *Oxytenia*, Copperweed

1. Half shrub 3' to 7' tall. Woody at base.
2. Deciduous.
3. Leaves — alternate, either pinnately parted into 3-5 long filiform divisions, or upper leaves entire.
4. Twigs — slender, erect, finely ridged, leafy or leafless and rush-like, grayish-strigose especially above and more or less canescent.
5. Fruit — achenes.
6. On dry alkaline soils southwestern Colorado and southwestern states. Ordinarily untouched by livestock. Sheep have been poisoned by grazing the plant-tops on dry ranges.

MYRTLE PACHISTIMA



Winter twig with  
leaves, x  $\frac{1}{2}$



Leaves, x 1



Seed pod, x  $1\frac{1}{2}$

### 59. *Pachistima myrsinites*

Myrtle *Pachistima*, Mountain Lover, Boxwood

1. **Low shrub** —  $\frac{1}{2}$ ' to 3' tall.
2. **Evergreen** — the leaves opposite, leathery,  $\frac{1}{2}$ " to  $1\frac{1}{2}$ " long, subsessile, elliptic to oblong, serrate margined toward the end. (Bearberry has alternate leaves with entire margins.)
3. **Old bark** — becoming corky, thickened and transversely checked.
4. **Twigs** — slender, straight, somewhat 4-sided, dark gray or brown.
5. **Lenticels** — inconspicuous.
6. **Pith** — minute, rounded or irregular, brownish and spongy.
7. **Buds** — opposite, sessile, ovoid, appressed, very small, with about 2 pairs of exposed scales; the terminal buds larger and with more scales.
8. **Leaf scars** — opposite, minute, crescent-shaped, somewhat raised.
9. **Bundle scars** — 1, indistinct.
10. **Stipule scars** — none.
11. **Fruit** — a 2-valved capsule, whitish, egg-shaped, about  $\frac{1}{4}$ " long, 1 or 2-seeded.
13. **Occurrence** — Wyoming and mostly western slope of Colorado in shady timber types as Douglas fir, aspen, and spruce-fir. Good fall and winter food for deer, elk and bighorns.



VIRGINIA CREEPER



Cane with tendril  
and bud, x 1



Leaf, x 1/4

## 60. *Parthenocissus inserta*

### Virginia Creeper, Thicket Creeper

1. **A vine** — climbing extensively by means of tendrils.
2. **Deciduous.**
3. **Canes** — slender to medium, very flexible, light tan, smooth, somewhat angled at nodes, tendrils with adhesive terminal discs.
4. **Lenticels** — present but not prominent.
5. **Pith** — round, continuous, greenish.
6. **Buds** — alternate, 2-4 scaled, light brown, short, conical.
7. **Leaf scars** — oval to half-round, large.
8. **Bundle scars** — several in a ring.
9. **Stipule scars** — present, long and narrow.
10. **Fruit** — small grape-like berries in clusters, very sour.
11. **Occurrence** — very scarce — in canyons at low elevations, Wyoming, eastern Colorado, South Dakota, Nebraska; palatability very low for all classes of game and livestock. Fruit commonly eaten by song birds.

SQUAWAPPLE



Enlarged twig  
with bud, x 4



Fruits, x  $\frac{2}{3}$



Winter twigs (x 1) and  
enlarged bud, x  $3\frac{1}{2}$



Leaves, x  $\frac{2}{3}$



## 61. *Peraphyllum ramosissimum*

### Squawapple

1. **Low to medium-sized shrub** 3'-6' tall.
2. **Deciduous.**
3. **Older bark** — glaucous, red brown, splitting longitudinally but not shredded.
4. **Twigs** — medium sized, somewhat silky pubescent to nearly glabrous, red-brown, not angled at nodes; usually with numerous spur shoots.
5. **Lenticels** — inconspicuous.
6. **Pith** — irregularly 5-7 pointed, continuous.
7. **Buds** — alternate, several-scaled, dark-brown with gray hairs, bud scales divergent at tips; bud scale scars conspicuous for many years.
8. **Leaf scars** — narrow.
9. **Bundle scars** — inconspicuous.
10. **No stipule scars.**
11. **Fruit** — a fleshy globose pome.
12. **Taste** — almond-like, somewhat sour.
13. **Relatively scarce** except locally in western Colorado and Wyoming. Fruits eaten by birds, deer and livestock, but not extensively.



LITTLELEAF MOCKORANGE



Branch in winter, x  $\frac{2}{3}$



Winter twig  
x 1

Winter twig  
with fruit, x 1



Leaves, x  $\frac{2}{3}$



Diagrammatic stem section and buds, x  $5\frac{1}{2}$



## 62. *Philadelphus microphyllus*

### Littleleaf Mockorange

1. **Low to medium-sized shrub**, much branched.
2. **Deciduous**.
3. **Twigs** — very slender, smooth, sometimes hairy at tips, dark-red brown, not angled at nodes.
4. **Lenticels**—inconspicuous.
5. **Pith** — large, round, white, continuous.
6. **Buds** — opposite, very small, gray hairy, terminal buds lacking.
7. **Leaf scars** — opposite, small, transverse connecting ridge present.
8. **Bundle scars** — 3.
9. **Stipule scars** — absent.
10. **Fruit** — a dry, several-seeded capsule; the sepals persistent, fused with the capsule for half its length, then the sepal tips abruptly divergent.
11. **Southern Colorado**; very common locally in the Arkansas River canyon between Canon City and Salida. Not palatable.

RED MOUNTAIN HEATH



Twig with leaves  
and fruits, x  $\frac{2}{3}$



Enlarged leaves, x 2



Enlarged cross-  
section of leaf  
blade, x 10

### 63. *Phyllodoce empetrifomis*

#### Red Mountain Heath

1. **Low, densely branching shrubs** forming clumps up to 20" high and 36" in diameter.
2. **Evergreen.**
3. **Leaves** —  $\frac{1}{4}$ "- $\frac{3}{4}$ " long with strongly revolute, thickened and rough margins, crowded (like needles of a fir tree), alternate, linear, 2 grooved.
4. **Twigs** — slender, wiry, roughened by leaf scars, ridged below the leaf scars, with short glandular bristles.
5. **Lenticels** — lacking.
6. **Pith** — minute, continuous.
7. **Buds** — minute, solitary, sessile, of scarcely evident structure.
8. **Leaf scars** — minute, crescent-shaped, alternate, raised.
9. **Bundle scars** — indistinguishable.
10. **No stipule scars.**
11. **Fruit** — 4 or 5 celled, many seeded, persistent, globe-shaped pod, splitting from the top and situated on long slender glandular stalks.
12. **Extremely rare in Colorado**; probably more common in Wyoming and northward at high elevations. Of doubtful palatability to any livestock. May be poisonous when taken in large quantity. Game birds and small mammals may use the fruits when available.



NINEBARK



Winter twig with  
persistent fruit, x  $\frac{2}{3}$



Enlarged buds,  
x  $3\frac{1}{2}$



Leaves, x  $\frac{2}{3}$

## 64. *Physocarpus monogynus*

### Ninebark

1. **Shrub** 2'-5' tall.
2. **Deciduous.**
3. **Old bark** — shreddy in many layers, brown.
4. **Twigs** — terete but 5-lined from the nodes, moderately slender, somewhat zig-zag, smooth, light brown.
5. **Lenticels** — inconspicuous.
6. **Pith** — relatively large, brownish, round to 6-angled, continuous.
7. **Buds** — alternate, rather small, sessile, conical oblong, or ovoid, with about 5 rather loose brown scales; bud scales persistent.
8. **Leaf scars** — alternate, half-elliptical or somewhat 3 lobed, raised, decurrent.
9. **Bundle scars** — 5, unequal, the lower one distinctly larger.
10. **Stipule scars** — small.
11. **Fruit** — persistent as dried, clustered, small follicles.
12. **Taste** — acrid.
13. **Occurs commonly throughout central Rocky Mountain region** in mountain shrub, ponderosa pine, Douglas fir and aspen types and along creek banks, foothills to lower edge of spruce zone. Usually very low palatability to all species in this region.

NARROWLEAF COTTONWOOD



Winter twig, x 1½



Leaf, x 1

## Key to the More Common Species of *Populus*

1. Twigs brown or red-brown ..... 2  
Twigs green, gray, or buff ..... 3
2. Lateral buds very sticky, aromatic, usually more  
than  $\frac{1}{4}$  inch long ..... 66. Balsam Poplar  
*P. balsamifera*  
Lateral buds not sticky, not aromatic, usually  
less than  $\frac{1}{4}$  inch long ..... 68. Quaking Aspen  
*P. tremuloides*
3. Trees of mountain valleys; buds brown, darker  
than bark ..... 65. Narrowleaf Cottonwood  
*P. angustifolia*  
Trees of plains; buds olive green  
to gray ..... 67. Plains Cottonwood  
*P. sargentii*

### 65. *Populus angustifolia* Narrowleaf Cottonwood

1. Medium to large tree.
2. Deciduous.
3. Old bark — thick, deeply furrowed, gray.
4. Twigs — smooth, gray-green or tan.
5. Lenticels — mostly long and narrow, light colored.
6. Pith — 5 pointed, continuous.
7. Buds — alternate, 3 scaled, shiny, somewhat sticky, brown, long, pointed.
8. Leaf scars — large, triangular or 3-lobed.
9. Bundle scars — 3, prominent.
10. Stipule scars — present.
11. No winter catkins; catkins hidden inside typical winter bud scales.
12. Typical balsam odor, bitter taste.
13. Along streams in valleys throughout the central Rocky Mountain region. Particularly valuable for streambank cover and shade along streams; used by beavers.



BALSAM POPLAR



Leaves, x  $\frac{1}{2}$

Winter twig,  
x  $\frac{1}{2}$

Enlarged  
bud, x 2

## 66. *Populus balsamifera*

Balsam Poplar, Tacamahac Poplar

1. Erect trees to 100' tall.
2. Deciduous.
3. Old bark — dark gray to blackish and becoming deeply furrowed, often roughened by dark excrescences.
4. Twigs — brown, moderate to stout, smooth.
5. Buds — alternate, sticky, aromatic.
6. Leaf scars — large.
7. Bundle scars — 3.
8. Stipule scars — narrow.
9. Catkins — drooping, 4-6 inches long.
10. Taste and odor — similar to other poplars, possibly more fragrant.
11. Found infrequently along streams and canyons in Rocky Mountain region. Not important as a range plant.

PLAINS COTTONWOOD



Enlarged winter  
twig, x 2



Leaf, x  $\frac{2}{3}$

67. *Populus sargentii*  
Plains Cottonwood

1. Large tree 60'-90' high.
2. Deciduous.
3. Bark — gray and smooth on young trunks; on old trees gray, thick, deeply furrowed and broadly ridged.
4. Twigs — stout, glabrous, green, gray or buff, roughened by elevated leaf scars.
5. Buds — alternate, glabrate, olive green or gray, conical, acute, covered with nonaromatic resin.
6. Bud scales — numerous.
7. Leaf scars — oval to three-lobed, large and elevated.
8. Bundle scars — 3 to 6.
9. Stipule scars — narrow.
10. Pith — 5 angled, brown.
11. Catkins — long and drooping, appearing before the leaves.
12. Throughout plains of Colorado, Wyoming, South Dakota, and Nebraska. Browsed by livestock on heavily used pastures; eaten by beavers; fallen leaves utilized by deer.



QUAKING ASPEN



Winter twig, x 1; bud  
enlarged, x 4; leaf  
scar and bundle scars, x 3½

Winter twig, x ¾



Leaf, x ½

68. *Populus tremuloides*  
Quaking Aspen

1. Small to medium-sized tree, spreading by root suckers.
2. Deciduous.
3. Old bark — mostly smooth, powdery white with dark blotches below the branches. Often thick furrowed and dark at base of older trunks.
4. Twigs — slender, round or somewhat angled, bright reddish-brown, smooth, shining.
5. Lenticels — light reddish-orange, scattered, oblong.
6. Pith — 5 angled or irregular to star-shaped, continuous.
7. Buds — narrowly conical, sharp-pointed, generally appressed, bud scales several, smooth, reddish-brown, shining; first bud scale directly over leaf scar.
8. Leaf scars — alternate, conspicuous, half-round or reniform.
9. Bundle scars — 3, simple or compound.
10. Stipule scars — blackish, more or less conspicuous.
11. Catkins — enclosed in plump winter buds.
12. Bark has bitter taste; bark and twigs also have a characteristic odor.
13. Common from foothills to timberline throughout Rocky Mountain region. Very important browse in some areas, especially for elk; important as food for beavers and grouse. Valuable for watershed protection and from an aesthetic standpoint.

BUSH CINQUEFOIL



Leaf, x  $\frac{2}{3}$



Winter twig  
with fruit, x  $\frac{2}{3}$



Twig segment  
showing persistent  
stipules,  
x  $\frac{2}{3}$

### 69. *Potentilla fruticosa*

#### Shrubby Cinquefoil, Bush Cinquefoil

1. Shrub  $\frac{1}{2}$ ' to 4' tall, freely branching.
2. Deciduous.
3. Old bark — shreddy or flaky, brown.
4. Twigs — slender, subterete, reddish, white-hairy, with quickly exfoliating bark.
5. Lenticels — not evident.
6. Pith — small, roundish, brown, rather spongy.
7. Buds — hidden behind persistent sheathing stipules, sessile, oblong, with about 4 somewhat striate exposed scales, the inner gray-hairy when visible.
8. Leaf scars — minute, rounded or oval, much raised on a clasping 3-nerved base bearing the persistent stipules at top.
9. Bundle scars — 1.
10. Stipules — persistent after leaf fall.
11. Fruit — sometimes persistent as dried capsules; dried inflorescence often persisting also.
12. Occurs throughout Rocky Mountain region in meadows and stream bottoms from foothills to alpine zones. Usually unpalatable, but heavily grazed by livestock when other forage is scarce; seldom used by big game. Commonly invades meadows when willows are depleted by overgrazing.



## Key to the More Common Species of *Prunus*

(Descriptions of individual species are on following pages)

1. Collateral buds common ..... 2  
Collateral buds lacking ..... 3
2. Low (less than 3') shrubs, spineless; twigs not  
conspicuously angled at  
the nodes .....72. Bessey Cherry  
***P. besseyi***
3. Tall shrubs, usually spine-tipped branches; twigs  
angled at the nodes .....70. Wild Plum  
***P. americana***  
Shrubs or trees without spines; twigs not  
conspicuously angled ..... 4
4. Twigs fine, buds less than  
 $\frac{1}{8}$ " long .....71. Pin Cherry  
***P. pennsylvanica***  
Twigs stout, buds more than  $\frac{1}{8}$ " long  
(usually  $\frac{1}{4}$ " long) .....73. Chokecherry  
***P. virginiana***

AMERICAN PLUM



Enlarged twig  
and buds, x 4



Winter twig,  
x  $\frac{2}{3}$



Leaves (two surfaces),  
x  $\frac{2}{3}$

70. *Prunus americana*  
American Plum, Wild Plum

(See also key, page 169)

1. Much branched shrub, sometimes tree-like.
2. Deciduous.
3. Old bark — dark gray, rough.
4. Twigs — small, rigid, red-brown, smooth to pubescent, often spiny; spur shoots usually present; often angled at nodes.
5. Lenticels — conspicuous, white, rounded.
6. Pith — round, small, light brown, continuous.
7. Buds — alternate, small, red-brown; several-scaled, frequently 2 and sometimes 3 buds at a node.
8. Leaf scars — alternate, upper edge hairy, raised leaf scar base is much darker than leaf scar or twig.
9. Bundle scars — 3.
10. Stipule scars — present.
11. Fruit — a drupe, oval, yellow to orange or red, edible;  $\frac{1}{2}$ " or more in diameter.
12. Typical astringent odor.
13. Twigs taste of bitter almond.
14. Common but not usually abundant, along streams and canyons at lower elevations over most of Rocky Mountain region. Fruits relished by coyotes. Thickets form good game cover. Generally of only fair palatability to livestock and big game but can be overgrazed.

BESSEY CHERRY



Enlarged winter  
twig, x 4



Leaves and fruit, x 1½



71. *Prunus besseyi*  
Bessey Cherry, Sand Cherry  
(See also key, page 169)

1. **Low, bushy shrub.**
2. **Deciduous.**
3. **Twigs** — smooth, red-brown, slender not angled at nodes.
4. **Lenticels** — inconspicuous.
5. **Pith** — round, small, continuous.
6. **Buds** — small, alternate, several-scaled, brown, rounded, often 2 or 3 at a node.
7. **Leaf scars** — small, half-round.
8. **Bundle scars** — 3.
9. **Stipule scars** — very narrow, inconspicuous.
10. **Fruit** — a persistent drupe.
11. **Taste** — fruits less acrid than most *Prunus*.
12. **Sandhills of Nebraska**, northern and eastern foothills of Black Hills and northeastern Colorado. Browsed by deer. Fruits valuable to birds; relished by coyotes.

PIN CHERRY



Winter twig  
and buds, x  $\frac{2}{3}$



Branchlet with fruit and leaves, x  $\frac{1}{2}$



Enlarged bud, x 3

## 72. *Prunus pennsylvanica*

### Pin Cherry

(See also key, page 169)

1. **Low to medium-sized shrub.**
2. **Deciduous.**
3. **Old bark** — thin ( $\frac{1}{3}$ - $\frac{1}{2}$  inch); red brown, marked by orange-colored bands of lenticels; smooth or scaly.
4. **Twigs** — shiny, with deciduous silver-colored epidermis, spur shoots often present.
5. **Lenticels** — in orange-colored bands.
6. **Pith** — small, brownish, continuous.
7. **Buds** — alternate, several scaled, red-brown, usually several near tip of twig.
8. **Leaf scars** — half round.
9. **Bundle scars** — 3.
10. **Stipule scars** — not evident.
11. **Fruit** — a drupe; in clusters of 3-6, from lateral buds, corymbose or umbellate, persistent.
12. **Occurs in limited abundance** at lower elevations in the central Rocky Mountain area. Valuable for wildlife for both food and cover.

COMMON CHOKECHERRY



Enlarged twig with buds  
and leaf scars, x 4



Winter twig  
with fruit, x  $\frac{2}{3}$



Leaf, x 1



### 73. *Prunus virginiana*

#### Common Chokecherry

(See also key, page 169)

1. **Medium to large erect shrub**; sometimes tree-like.
2. **Deciduous.**
3. **Old bark** — dull grayish-brown, slightly roughened.
4. **Twigs** — smooth, shiny, reddish-brown, slender to stout.
5. **Lenticels** — conspicuous, white, rounded to elongate.
6. **Pith** — round to 5 pointed, light colored, continuous.
7. **Buds** — ovate, pointed, several scaled but scale margins light colored and of papery texture.
8. **Leaf scars** — alternate, medium width, elliptical.
9. **Bundle scars** — 3, frequently sunken.
10. **No stipule scars.**
11. **Fruit** — a drupe, round, black, edible, in raceme.
12. **Typical astringent odor.**
13. **Twigs taste** of bitter almond.
14. **Very common along streams and canyons** at low and medium elevations throughout Rocky Mountain region. Important for livestock and big game as a browse when abundant; fruit important to game birds and to bears.

BALDWIN HOPTREE

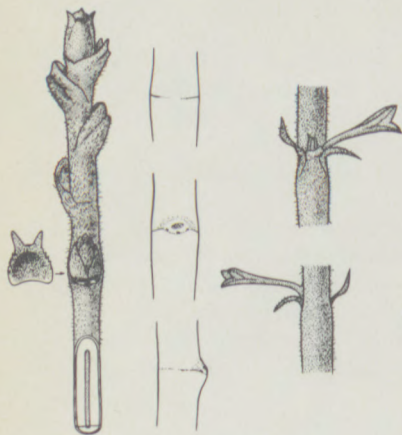


Branch with leaves and fruits, x  $\frac{2}{3}$

74. *Ptelea baldwini*  
Baldwin Hoptree

1. **Small tree or shrub** up to 20' tall.
2. **Deciduous.**
3. **Leaves** — palmately 3-foliolate, leaflets  $\frac{1}{2}$ " to  $2\frac{1}{2}$ " long, sessile or nearly so, lateral leaflets smaller and narrower than terminal, margins crenulate to entire, punctate, more or less minutely hairy.
4. **Twigs** — moderate-sized, warty and dotted, puberulent.
5. **Lenticels** — not distinct.
6. **Pith** — rather large, white, continuous, round.
7. **Buds** — alternate, moderate, sessile, depressed, not scaly, hidden beneath a tuft of dense silvery-silky hairs and almost surrounded by large leaf scars.
8. **Leaf scars** — large, elevated, horseshoe-shaped.
9. **Bundle scars** — 3, one on each side of U-shaped leaf scars.
10. **No stipules.**
11. **Fruit** — clusters of 2-celled, indehiscent samaras, each about  $\frac{1}{2}$ " long, nearly round, slightly notched at both ends, seed about  $\frac{1}{3}$  of width, the whole surface strongly reticulated, attached by rather delicate drooping pedicels  $\frac{1}{2}$ " long.
12. **Odor** — strong-scented foliage and young twigs due to granular-punctate character. Bitter taste.
13. **South half of Colorado, New Mexico,** and southward in canyons and sandy flats, mostly below 8,000'. Palatability low for all kinds of herbivorous game. Fruits may be useful food for birds.

ANTELOPE BITTERBRUSH



Enlarged twig, thick, persistent stipules, pith, leaf scars and undeveloped leaves, x 3½



Leaves, x 2/3

Enlarged bud and stipule, x 3½



Winter twig with small leaves, x 2

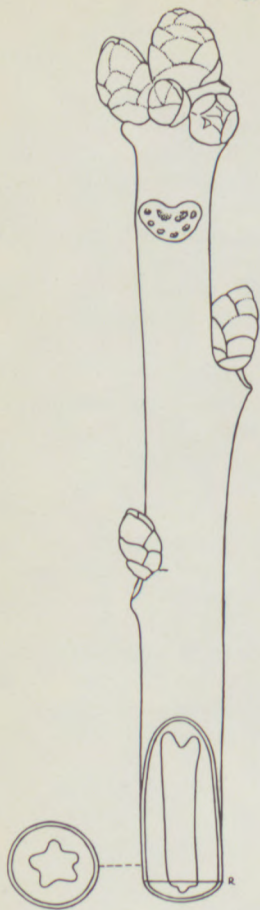


## 75. *Purshia tridentata*

### Antelope Bitterbrush

1. **Low to medium-sized shrub**; occasionally up to 5' tall, likewise occasionally somewhat prostrate.
2. **Deciduous to semi-evergreen**, small, partly-developed leaves often present in the winter.
3. **Twigs** — hairy, grayish to reddish brown, not angled at nodes, spur shoots present; twigs and leaves not sticky, as is cliffrose.
4. **Lenticels** — inconspicuous.
5. **Pith** — small, irregular, darker than wood, continuous.
6. **Definite winter buds** not formed — few embryonic leaves usually present at growing tips all winter.
7. **Leaf scars** — alternate, raised, small.
8. **Bundle scars** — 1.
9. **Stipules** — reddish-tan, usually persisting and very thick on spur shoots.
10. **Fruit** — an achene, falling when mature in summer.
11. **Very bitter** — quinine-like taste.
12. **Throughout Colorado and southern Wyoming** at low to medium elevations in pinon-juniper and ponderosa pine zone. A palatable and important browse. Usually heavily browsed on overstocked ranges.

GAMBEL OAK



Enlarged diagrammatic  
twig with buds, pith  
and leaf scar, x 7



Winter twig, x 1



Leaf, x 1/2

76. *Quercus gambeli*  
Gambel Oak, Scrub Oak

1. Shrub to small tree up to 25' tall.
2. Deciduous.
3. Old bark — gray and rough.
4. Twigs — light brown, sparingly puberulent, often furrowed and fluted, not conspicuously angled.
5. Lenticels — raised, rounded, light colored.
6. Pith — star-shaped, continuous.
7. Buds — alternate, blunt, several-scaled, light brown, puberulent, often clustered at tips of twigs.
8. Leaf scars — alternate, raised, triangular to half-round.
9. Bundle scars — several, arranged in triangular, oval, or crescent-shaped groups.
10. No stipule scars.
11. Fruit — an acorn — important as bird and animal food during good seed years.
12. A very common and abundant browse in western and southern Colorado. Under existing conditions it provides considerable browse for cattle, but is relatively unpalatable and is very lightly grazed except under overgrazed conditions. An important browse for deer in many areas, though relatively low in palatability. Acorns of most importance to turkeys and deer. Excellent watershed cover.

BUR OAK



Winter twig, x  $\frac{2}{3}$



Leaf, x  $\frac{1}{2}$



## 77. *Quercus macrocarpa*

### Bur Oak, Mossy Cup Oak

1. **Small to medium-sized tree** (sometimes shrubby).
2. **Deciduous.**
3. **Old bark** — gray to yellowish brown, flaky, deeply fissured.
4. **Twigs** — stout, yellowish brown, ridged, usually downy, some trees develop corky ridges on older twigs.
5. **Lenticels** — minute, pale, raised dots, often inconspicuous.
6. **Pith** — 5 pointed, star-shaped.
7. **Buds** — conical to broadly ovate, sharp-pointed or blunt, reddish-brown, covered with pale wool; bud scales several.
8. **Leaf scars** — triangular to half-round, raised.
9. **Bundle scars** — several, compounded in a triangular or crescent-shaped ring.
10. **Stipules** — often persisting at tips of twigs, long, downy, thread-like.
11. **Fruit** — a large ovoid acorn, half or almost wholly immersed in the cup. Bracts on margin of the cup form a conspicuous fringe.
12. **In the Black Hills** of South Dakota and in Wyoming. An important big game browse and mast for birds and squirrels.

BUCKTHORN



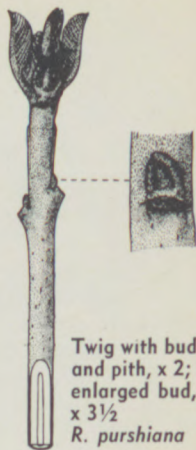
Winter twig  
with fruit, x  $\frac{2}{3}$   
*R. alnifolia*



Leaf, x  $\frac{1}{2}$   
*R. alnifolia*



Enlarged winter  
twig, x 2  
*R. smithii*



Twig with buds  
and pith, x 2;  
enlarged bud,  
x  $3\frac{1}{2}$   
*R. purshiana*



Winter twig, x  $\frac{2}{3}$   
*R. purshiana*

78. **Rhamnus spp.**  
Buckthorn

1. Shrubs, medium to tall.
2. Deciduous.
3. Twigs — smooth, red-brown to gray-brown, not angled at nodes, some tipped with a short spine; inner bark yellow.
4. Lenticels — inconspicuous.
5. Pith — round, white, continuous.
6. Buds — alternate to nearly opposite, naked, several scaled, scales thin and of papery texture.
7. Leaf scars — alternate or somewhat opposite.
8. Bundle scars — 3.
9. Stipule scars — present.
10. Fruit — berry-like, black, eaten by birds.
11. Taste — bark acrid, bitter, with drastic laxative properties.
12. Rare, one species (*R. smithii*) reported in southwestern Colorado, and one (*R. alnifolia*) in northern Wyoming in valleys and hillsides.

RHODODENDRON



Winter twig with persistent  
fruits, x  $1\frac{1}{2}$ . Enlarged  
twig with buds, x 3



Branch with flowers and  
terminal leaf clusters, x  $\frac{1}{2}$



**79. Rhododendron spp.**

Rhododendron, Azalea

1. **Shrubs** usually about 1' tall but up to 6'.
2. **Deciduous.**
3. **Leaves**—alternate, clustered toward ends of twigs, petioled, entire,  $\frac{1}{2}$ "-2" long, elliptic, ovate, oval, or obovate, beset with rusty hairs and glandular-ciliate, thin, entire or wavy-margin, paler green beneath.
4. **Twigs**—moderately stout, younger twigs covered by rusty hairs.
5. **Lenticels**—indistinguishable.
6. **Pith**—continuous, spongy, round, light colored.
7. **Buds**—solitary, sessile, clustered toward end of twigs, ovoid, 6 or more ciliate scales.
8. **Leaf scars**—prominent, alternate, half round or shield-shaped.
9. **Bundle scar**—1, round, large.
10. **Stipule scars**—lacking.
11. **Fruit**—a persistent, egg-shaped, 5 celled pod or capsule,  $\frac{1}{4}$ " long with numerous small seeds.
12. **North central Colorado, Wyoming and northward** at 9,000' to 11,000' in wet soils. Poisonous to livestock, especially sheep, if taken in any quantity. Fruits may be palatable to game birds and small mammals.

SMOOTH SUMAC



Winter twig, x 1;  
enlarged leaf scar, x 3



Winter twig and  
fruit cluster, x 2



Leaf and fruit  
in summer, x  $\frac{1}{4}$

Key to the More Common Species of **Rhus**

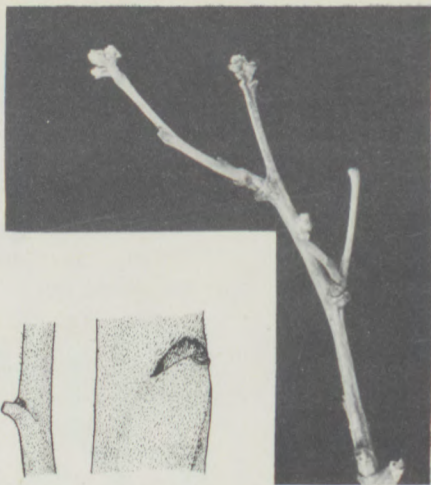
Buds visible .....80. Smooth Sumac  
**R. glabra**

Buds not visible  
(except flower buds) .....81. Skunkbush Sumac  
**R. trilobata**

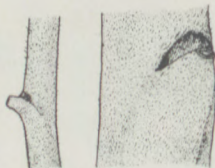
80. **Rhus glabra**  
Smooth Sumac

1. **Sparingly branched shrub**, 2'-6' tall, spreading by suckers from roots.
2. **Deciduous**.
3. **Old bark** — thin, dark brown, smooth to rough-scaly.
4. **Twigs** — very coarse, glaucous, brown, reddish-brown or bluish.
5. **Lenticels** — small, rounded.
6. **Pith** — large, continuous, same shape as twig, yellowish.
7. **Buds** — alternate, medium-sized, light colored, wooly.
8. **Leaf scars** — alternate, somewhat lobed and nearly encircling bud.
9. **Bundle scars** — 7 plus.
10. **No stipule scars**.
11. **Fruit** — of small, rounded red-orange drupes in conical clusters at tips of twigs.
12. **At lower elevations** on south slopes and valley bottoms throughout the central Rocky Mountain region but not commonly abundant. Palatable to deer, and the fruits important to birds.

SKUNKBUSH SUMAC



Winter twig,  
x 1



Lateral buds hidden  
beneath persistent  
leaf bases, x 7



Twig segments with  
male catkins above  
(x 2) and persist-  
ent fruits below, x 3



Leaves. x 1



81. **Rhus trilobata**  
Skunkbush Sumac

1. Much branched, spreading shrub, 2'-7' tall.
2. Deciduous.
3. Old bark — gray to blackish.
4. Twigs — slender, light brown, pubescent to nearly glabrous, often angled at the nodes.
5. Lenticels — small, light colored, elongate.
6. Pith — round, brown, continuous.
7. Buds — alternate, small, hidden under persistent petiole base.
8. Leaf scars — alternate, raised, round, small.
9. Bundle scars — 1.
10. No stipule scars.
11. Fruit — a small berry-like drupe, globose to ovoid, orange to red, viscid-pubescent.
12. Male catkins present, small averaging about  $\frac{1}{4}$ " long.
13. Characteristic disagreeable odor when crushed.
14. Very common on hillsides and valleys at lower elevations throughout the Rocky Mountain region. Relatively unpalatable but sometimes browsed by game and livestock on overstocked ranges.

CURRENT AND GOOSEBERRY

A.



C.

A. and B. Smooth winter twigs, x  $\frac{2}{3}$  and 1

C. and D. Prickly winter twigs, x  $\frac{2}{3}$  and 1

B.



Twig with fruit, x  $\frac{2}{3}$



Enlarged spines, leaf scar and bud, x 3



Leaf of wax currant, x 1



Leaf of gooseberry, x 1

D.

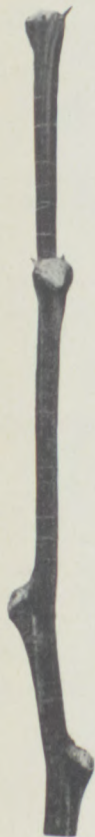


## 82. *Ribes* spp.

### Currant, Gooseberry

1. Moderate to thickly branched shrubs, 2'-5' tall.
2. Deciduous.
3. Twigs — slender to medium, light tan to brown, glabrous to finely hairy — some species glandular — with or without spines and/or prickles. Epidermis quickly shredding.
4. Lenticels — not evident.
5. Pith — round to 5-pointed, spongy.
6. Buds — medium, from light tan to dark, red-brown; about 6 loose, thin scales.
7. Leaf scars — alternate, narrow.
8. Bundle scars — 3.
9. Stipules — on some species modified into spines. Stipule scars not evident.
10. Fruit — a berry, edible, and a favorite food of birds.
11. At low to high elevations throughout the Rocky Mountain region. Important as browse in some localities but ordinarily not heavily grazed except in overgrazed areas. Gooseberries mostly unpalatable, some currant species are palatable to both livestock and big game.

NEW MEXICAN LOCUST



Winter twig, x 2



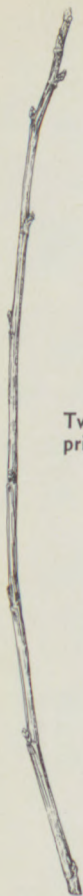
Leaf and fruit, x  $\frac{2}{3}$



83. *Robinia neomexicana*  
New Mexican Locust

1. Shrubs or small trees 20'-25' tall.
2. Deciduous.
3. Young twigs hairy and spiny, the hair deciduous, light brown.
4. Lenticels — inconspicuous.
5. Pith — 5-pointed, continuous, pinkish-white, margin often flecked with brown pores.
6. Buds — not visible; terminal absent, lateral minute, naked.
7. Leaf scars — heart shaped.
8. Bundle scars — 3.
9. Stipules — modified into persistent spines.
10. Fruit — a typical dry legume (or pod) 3" to 4" long and  $\frac{1}{3}$ " wide, hairy, several-seeded. Pods often persist through the winter.
11. Southern Colorado. Has been planted in gullies for erosion control at lower elevations in other parts of the region. Seeds probably eaten by birds and small animals.

ROSE



Smooth winter  
twig, x  $\frac{2}{3}$



Twig with buds,  
prickles and stipule, x  $1\frac{1}{2}$



Winter twig  
with prickles, x  $\frac{2}{3}$



Prickled twig  
with pith, x 3



Leaf and fruit, x 1



Enlarged leaf  
margin, x 3



Twig with fruit and  
rachis of leaf, x  $\frac{2}{3}$

## 84. *Rosa* spp.

### Wild Rose

1. Moderately branched shrub 1'-4' tall.
2. Deciduous.
3. Older bark — has thin, peeling silvery layer.
4. Twigs — medium-sized, dark red to purplish, often glaucous; with straight or recurved light tan prickles. Prickles are greatly enlarged at the base, and may be sparse to very thick.
5. Lenticels — small, rounded, not very conspicuous.
6. Pith — large round, continuous, nearly same color as wood.
7. Buds — alternate, small to medium, several-scaled, about same color as twigs.
8. Leaf scars — alternate, very narrow, extending about half way around the stem.
9. Bundle scars — 3.
10. Stipule scars — not noticeable — appear to be continuations of the leaf scar.
11. Fruit — red, pome-like. Used as extensively as food by animals and birds, persistent.
12. Throughout Rocky Mountain region at lower and medium elevations; most abundant along creeks and valley bottoms but common in many types. Important as a browse, particularly in summer, for big game and livestock.

BOULDER RASPBERRY



Winter twig,  
x  $\frac{1}{2}$

Leaves, x  $\frac{1}{2}$



Winter twig with  
buds and persistent  
stipules, x  $1\frac{1}{2}$



## Key to the More Common Species of **Rubus**

1. Outer bark cracking and peeling .....86. Western Thimbleberry  
**R. parviflorus**
- Outer bark not cracking and peeling ..... 2
2. Twigs prickly .....87. Red Raspberry  
**R. idaeus**
- Twigs not prickly .....85. Boulder Raspberry  
**R. deliciosus**

### 85. **Rubus deliciosus**

#### Boulder Raspberry

1. Moderately branched shrub 2'-5' tall, stems perennial.
2. Deciduous, some petioles often persisting into winter.
3. Second year bark scaly and peeling.
4. Twigs—stout to medium, cream-colored or tan, tomentose or puberulent, angled at nodes, usually unarmed.
5. Lenticels—inconspicuous.
6. Pith—round, large, continuous.
7. Buds—alternate, several-scaled, hairy, hidden behind persistent stipules.
8. Leaf scars—raised, rounded.
9. Bundle scar—1.
10. Stipules—persistent.
11. Fruit—typical of raspberries, but wide and flattened, dry and seedy, rarely persisting into the winter. Fruits taken by birds.
12. Wood rays—prominent.
13. Dry rocky slopes and canyons in pinon-juniper and lower ponderosa pine zones of the east slope in Colorado. Not abundant and not generally used as a browse by preference.

WESTERN THIMBLEBERRY



Twig segment  
with buds and  
stipules, x 1½



Winter twig, x ¾



Leaf, x 1

## 86. *Rubus parviflorus*

### Western Thimbleberry

1. **Shrub** 1'-3' tall, simple or sparsely branched.
2. **Deciduous**, some petioles often persisting into winter.
3. **Twigs** — stout, smooth, tan, the outer bark cracking and peeling.
4. **Lenticels** — not evident.
5. **Pith** — medium-sized, continuous, round.
6. **Buds** — rather large, reddish brown, ragged appearing.
7. **Leaf scars** — alternate, raised, nearly round.
8. **Bundle scars** — 5, in a ring.
9. **Stipules** — persistent as a sheath, clasping the base of the bud.
10. **Fruit** — red, raspberry-like, relished by birds and small animals.
11. **In moist shaded places**, usually along creeks and road banks at medium elevations in the mountains of Colorado and Wyoming and the Black Hills. Fair sheep browse, poor for cattle.

RED RASPBERRY



Enlarged winter twig  
segment with stipules  
and petiole base, x 1½

Leaves, x ¼



## 87. *Rubus idaeus*

### Red Raspberry

1. **Low shrub** 1'-3' tall, the stems biennial and simple.
2. **Deciduous** — some petioles often persisting into winter.
3. **Twigs** — (canes) stout, the epidermis smooth except for the numerous prickles, often glaucous, red-brown to purplish, short-lived and soft wooded.
4. **Lenticels** — inconspicuous.
5. **Pith** — large, continuous, satiny.
6. **Buds** — medium-sized, several scaled, the scales loose at tips, sometimes superposed.
7. **Leaf scars** — ragged, alternate, petioles often break above stem leaving round or half-round stub.
8. **Bundle scars** — not evident.
9. **Stipules** — small and appear to be part of petiole base.
10. **Fruit** — a typical raspberry, edible.
11. **Usually on exposed or rocky slopes** and road banks or other disturbed soils at low and medium elevations throughout Rocky Mountain region. Not abundant except in small local patches. Not important as a browse.

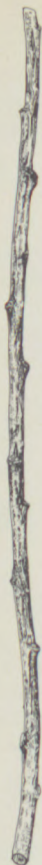
WILLOW



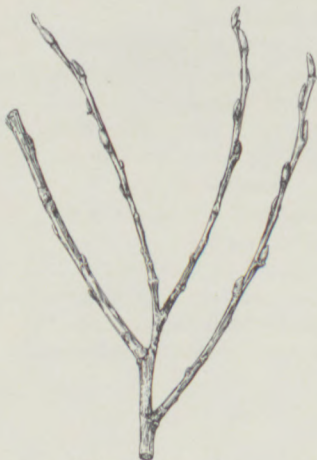
Enlarged bud seen from stem side. Scale splitting on inside, x 3½



Enlarged buds and leaf scar, x 3



Twig with branch scars, x 1



Winter twig, x 1



Leaves of two species, x ¾

## 88. *Salix* spp.

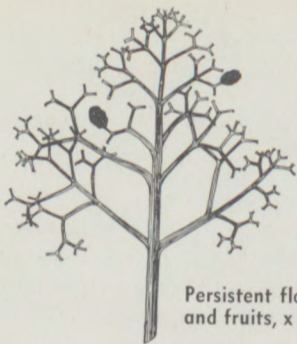
### Willows

1. **Shrubs, small trees, or low, creeping forms** (alpine) of many species.
2. **Deciduous.**
3. **Old bark** — variable in texture and color, astringent.
4. **Twigs** — round, gray, green, blue, yellow, red; smooth, glaucous, hairy; usually with a brittle zone near the base. Terminal end of twig frequently falls off early in season leaving a branch scar. Grows from axillary buds.
5. **Lenticels** — usually conspicuous.
6. **Pith** — round to irregular (5 angled), continuous.
7. **Buds** — alternate, sessile, appressed, solitary, small to medium sized, often beaked or "duck-billed," bud scales 1, this cap-like, splitting on inside. No true terminal bud in willows.
8. **Leaf scars** — narrow, U or crescent-shaped, usually elevated somewhat.
9. **Bundle scars** — 3.
10. **Stipule scars** — small.
11. **Very important as browse for domestic animals and wildlife;** streambank and watershed protection. Buds are important food for birds in winter. Willows are particularly important along trout streams in furnishing shade and cover and as a secondary beaver food.

ELDER



Withering stem tip, x 1



Persistent flower and fruits, x  $\frac{2}{3}$



Winter twig, x  $\frac{2}{3}$



Buds and leaf scars, x 1



Leaf, x  $\frac{2}{3}$



Pith x  $\frac{2}{3}$



Petiole base, x 2



## 89. *Sambucus* spp.

### Elder

1. **Shrubs**, or small trees, stems numerous coarse, erect.
2. **Deciduous**.
3. **Bark** — thin, dark brown, tinged with red, irregularly furrowed and ridged.
4. **Twigs** — coarse, sometimes glaucous, buff to brown or reddish, somewhat angled.
5. **Lenticels** — numerous, medium sized and raised.
6. **Pith** — very large, round, soft, satiny, continuous, white to light brown.
7. **Buds** — opposite, large rounded, blunt, usually greenish; terminal winter buds generally absent.
8. **Leaf scars** — opposite, large, nearly encircling twig.
9. **Bundle scars** — 3-5, prominent or sometimes inconspicuous.
10. **No stipule scars**.
11. **Fruit** — in cluster of berry-like, juicy, drupes with 3-5 one-seeded nutlets in each drupe.
12. **Some with a pronounced odor** when crushed.
13. **Along streams and under aspen and coniferous timber** from low elevations up into the spruce zone, throughout the Rocky Mountain region. Relatively palatable but not abundant. Palatable to deer and elk, and the fruits taken by birds and bears.

BLACK GREASEWOOD



Winter twig, x  $\frac{2}{3}$



Twig with sunken buds, x  $1\frac{1}{2}$



Fruiting branch,  
x  $\frac{2}{3}$



Winged seed,  
x  $\frac{2}{3}$



Enlarged female (staminate)  
flower and leaves, x 3

90. *Sarcobatus vermiculatus*  
Black Greasewood

1. **Medium-sized** (1'-7' high) shrub with stiff divergent branches.
2. **Deciduous.**
3. **Twigs** — light gray to cream colored, spine-tipped, glabrous or slightly pubescent, with spur shoots; epidermis peeling on 2 year twigs.
4. **Lenticels** — inconspicuous.
5. **Pith** — very small, round, continuous.
6. **Buds** — alternate, small, sunken, with sparse white hairs in cavities.
7. **Leaf scars** — small, V-shaped.
8. **Bundle scars** — 1.
9. **No stipule scars.**
10. **Catkin-like**, staminate flowers on terminal spikes, sometimes persistent.
11. **Leaves and young twigs** salty to taste.
12. **Very common on moist, saline flats** at base of mountains and on plains throughout Rocky Mountain region but rarely within the national forests. Usually considered relatively low in palatability but an important sheep food on saline desert ranges in Intermountain Region.

SILVER BUFFALOBERRY



Leaf, x  $\frac{2}{3}$



Enlarged flower buds  
and spine, x  $3\frac{1}{2}$



Winter twig with  
leaf buds, x  $1\frac{1}{2}$



## Key to the Species of *Shepherdia*

- Twigs silvery .....91. Silver Buffaloberry  
*S. argentea*  
Twigs copper colored .....92. Russet Buffaloberry  
*S. canadensis*

### 91. *Shepherdia argentea*

#### Silver Buffaloberry

1. **Medium to tall, much branched shrub; branches stiff and divergent.**
2. **Deciduous.**
3. **Old bark — dark gray.**
4. **Twigs — scurfy, i.e., covered with numerous peltate scales, spiney, silvery to light tan.**
5. **Lenticels — not evident.**
6. **Pith — round or irregular, reddish brown, continuous.**
7. **Buds — naked, opposite, silvery to light tan, resembling twig; vegetative buds elongate, standing parallel to twig; flower buds rounded to oval in clusters and divergent.**
8. **Leaf scars — opposite, small, raised, half-round.**
9. **Bundle scars — 1.**
10. **Stipule scars — not evident.**
11. **Fruit — an ovoid scarlet or orange berry, acid and edible; fairly persistent.**
12. **Found occasionally along stream bottoms at low and medium elevations throughout the Rocky Mountain region, rarely within the national forests. Unpalatable as browse, but the fruits are taken by birds, and afford excellent cover for small game because of its habit of growing in rather dense thickets.**

RUSSET BUFFALOBERRY



Winter twig, x  $\frac{2}{3}$



Enlarged terminal leaf  
bud and flower buds, x 4



Winter twig, x  $\frac{2}{3}$



Enlarged shield-  
shaped scales, x 20



Leaves, x 1

## 92. *Shepherdia canadensis*

### Russet Buffaloberry

1. **Medium sized shrub**, much branched, many of the branches may be decumbent.
2. **Deciduous**.
3. **Twigs**—scurfy, russet or copper colored, thornless. Covered with numerous peltate scales.
4. **Lenticels**—not evident.
5. **Pith**—round or irregular, reddish brown, continuous.
6. **Buds**—naked, opposite, russet colored like branches but often darker; stalked, standing nearly vertically alongside the twigs; clusters of flower buds often present.
7. **Leaf scars**—opposite, raised, small, half-round to nearly oval.
8. **Bundle scars**—1.
9. **Stipule scars**—not evident.
10. **Fruit**—orange to red, oval, berry-like, very juicy and bitter or tart.
11. **Shaded, wooded or partly wooded slopes** in ponderosa pine, Douglas fir and lodgepole pine zones throughout Rocky Mountain region. Not palatable and hence not important as a browse, except for mountain goats in the Black Hills. Fruits are eaten by birds and animals and its game cover qualities are fair.

GREENE'S MOUNTAIN ASH

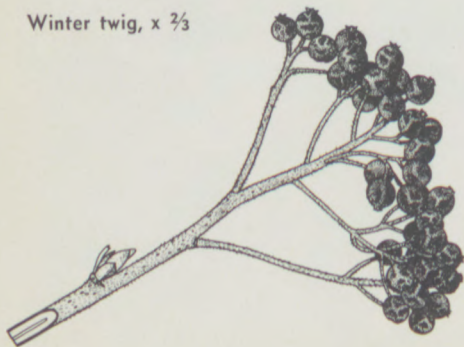


Leaf, x  $\frac{2}{3}$

Winter twig, x  $\frac{2}{3}$



Winter twig, x  $\frac{2}{3}$



Flowering branch  
with fruits, x  $\frac{2}{3}$



93. *Sorbus scopulina*  
Greene's Mountainash

1. **Medium to tall shrub.**
2. **Deciduous.**
3. **Bark** — thin ( $\frac{1}{8}$  inch); light gray, smooth or slightly roughened by scales, inner bark fragrant.
4. **Twigs** — smooth, glaucous, reddish brown to green, not angled at nodes.
5. **Lenticels** — conspicuous.
6. **Pith** — round, light brown, continuous.
7. **Buds** — alternate, large, resinous, shiny, points turning to one side, pilose (distinct hairs); inner scales with matted hairs in the bud.
8. **Leaf scars** — prominent, crescent-shaped, raised; many current leaf scars colored vinous red.
9. **Bundle scars** — 3 to 5.
10. **No stipule scars.**
11. **Fruit** — berry-like pomes in clusters, usually orange in color. Used as food for birds.
12. **Moist areas along creeks and under aspen and timber,** usually in shade throughout mountains of Colorado and Wyoming and higher elevations of Black Hills, but relatively scarce. Not important as browse.

SHINYLEAF SPIREA



Winter twig,  
x  $\frac{2}{3}$

Winter twig,  
x  $\frac{2}{3}$

Twig with dry  
flower head, x  $\frac{2}{3}$

Enlarged bud and  
leaf scar, x  $3\frac{1}{2}$



Enlarged  
flower, x  $5\frac{1}{2}$



Leaf, x  $\frac{2}{3}$

## 94. *Spiraea lucida*

### Shinyleaf Spirea

1. **Low shrub**; stems usually simple, erect, and rather delicate.
2. **Deciduous**.
3. **Twigs** — smooth, light red-brown and very shiny as if varnished, angled at nodes.
4. **Lenticels** — inconspicuous.
5. **Pith** — round, white, continuous.
6. **Buds** — alternate, several scaled, brown, rounded.
7. **Leaf scars** — very small, alternate.
8. **Bundle scars** — minute 1.
9. **Stipule scars** — none.
10. **Fruit** — small, dry, several seeded follicles. No catkins.
11. **An inconspicuous shrub** of northern Wyoming and Black Hills. Not important as a browse, although used by deer in summer.

SNOWBERRY



Leaves, x 1



Fruits, x 1



Pith, x 3



Enlarged twig with buds, stipular line, and bundle scar, x 4



Leaves, x 1/4



Leaves, x 1/4



## 95. *Symphoricarpos* spp.

### Snowberry

(Several species of variable appearance)

1. **Low to medium, much branched, upright shrub.**
2. **Deciduous.**
3. **Old bark**—gray to brown, fibrous, splitting longitudinally and peeling.
4. **Twigs**—usually slender, smooth, light brown or tan, often pubescent.
5. **Lenticels**—inconspicuous.
6. **Pith**—round, brown or blackish, continuous.
7. **Buds**—opposite, small but rather prominent and about same color as twigs, several scaled, hairy, no terminal buds.
8. **Leaf scars**—opposite, elevated, small and narrow, connected by a distinct, raised stipular line.
9. **Bundle scars**—1, inconspicuous.
10. **Stipule scars**—not evident.
11. **Fruit**—white berries, often persistent either singly or in clusters, usually turning blue in winter. No catkins.
12. **Abundant in Rocky Mountain region.** Palatability generally variable with season, i.e., the succulent fruiting tips are heavily used by deer and all classes of livestock in the fall and winter, but stems and leaves available at other seasons are lightly utilized, unless the range is in poor condition. Many species of small game use for both food and cover, especially in areas where the growth is dense and tall.

TAMARISK



Winter twig, x 1

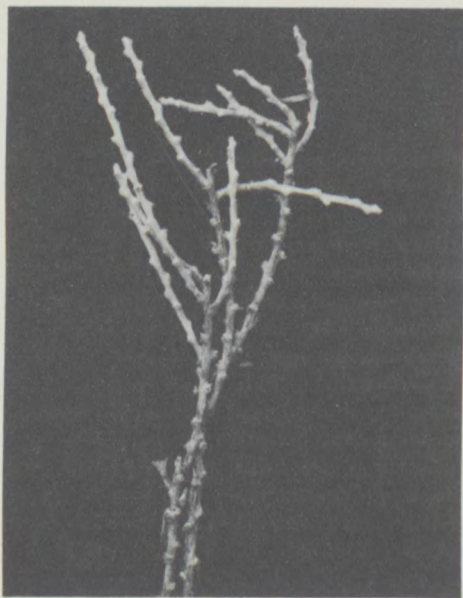


Twig with  
multiple buds, x 1½

96. **Tamarix spp.**  
Tamarisk, Salt Cedar

1. **Shrub** — erect, medium to tall.
2. **Deciduous**. Leaves alternate, scalelike, feathery, sparse, resembling those of junipers.
3. **Twigs** — red brown, glabrous, roughened by leaf or twig scars, long and slender, not angled at nodes.
4. **Lenticels** — conspicuous, round, white.
5. **Pith** — small, green-white, continuous.
6. **Buds** — alternate, very small, several scaled, light yellow to pink, rounded. Also numerous adventitious buds under the bark. Solitary or concentrically multiple.
7. **Leaf scars** — narrow.
8. **Bundle scars** — not evident.
9. **No stipule scars**.
10. **Colorado in heavy alkaline soils at lower elevations** — usually along stream channels.

GRAY HORSEBRUSH



Winter twig, x 1



Leaves, x  $\frac{2}{3}$



Key to the More Common Species of <b>Tetradymia</b>	
Twigs spiny .....	98. Cottonthorn Horsebrush <b>T. spinosa</b>
Twigs not spiny .....	97. Gray Horsebrush <b>T. canescens</b>

**97. Tetradymia canescens**  
Gray Horsebrush

1. Shrub 2'-3' tall, much branched.
2. Deciduous.
3. Twigs — gray with appressed tomentum, not angled or spined.
4. Lenticels — not evident.
5. Pith — round, continuous.
6. Buds — alternate, hidden by thick gray-white hairs.
7. Leaf scars — small, crescent shaped.
8. Bundle scars — not evident.
9. No stipule scars.
10. Fruit — achenes, dried inflorescence persisting, involucre bracts 4.
11. Colorado and southern Wyoming in sagebrush and rabbitbrush types. Common but not abundant. Said to be poisonous — causing bighead.

COTTONTHORN HORSEBRUSH



Winter twig with persistent  
flower bracts, x 1  
Twig portion with  
buds and spines, x 1½



Summer twig with  
primary leaves modi-  
fied into spines,  
flower, x 2/3

98. *Tetradymia spinosa*  
Cottonthorn Horsebrush

1. **Shrub**, rigidly branched, 2'-4' tall.
2. **Deciduous**.
3. **Twigs**—densely white tomentose even in age with rigid straight or recurved spines about  $\frac{1}{2}$ -1 inch long.
4. **Lenticels**—not evident.
5. **Pith**—round, white, continuous.
6. **Buds**—alternate, small, hidden by thick, gray-white hairs.
7. **Leaf scars**—small, crescent shaped; some leaves modified as persistent spines.
8. **Bundle scars**—not evident.
9. **No stipule scars**.
10. **Fruit**—achenes with soft hairs, woolly at base, these hairs about as long as the pappus.
11. **Desert areas of Wyoming and Colorado**—rather scarce. Considered to be palatable for antelope and sheep. Another species, *T. nuttalli*, occurs in northwestern Colorado. This is similar to the above except that the older branches become smooth.

TEXAS DESERT RUE



Summer twig with leaves  
and flowers, x 1



99. *Thamnosma texana*

Texas Desert Rue

1. A half-shrub 6"-18" high.
2. Deciduous (early).
3. Leaves — simple, linear to filiform, entire,  $\frac{1}{4}$ " to  $\frac{1}{2}$ " long, strong-scented, glandular.
4. Twigs — round, like broom straw, heavily punctate-glandular.
5. Lenticels — lacking or indistinguishable.
6. Pith — indistinct.
7. Buds — alternate, small (hardly as large as leaf scar), collateral, in pairs, threes or fours; scale a sac-like hood, very glandular.
8. Leaf scars — relatively large, raised, white tomentose, half-round to crescent-shaped.
9. Bundle scars — one.
10. No stipule scars.
11. Fruit — a leathery 2-3 celled, 2-3 lobed capsule, opening at the apex.
12. Possibly may be in southwestern Colorado, more common in New Mexico and southward. Palatability very low.

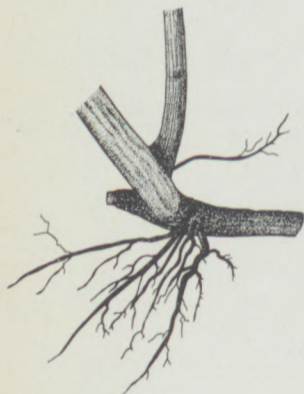
WESTERN POISON IVY



Winter twig with fruit, x 1



Enlarged bud and  
leaf scars, x 2



Stem with  
aerial rootlets, x 1



Leaf and  
flower, x 1/4

100. *Toxicodendron radicans* var. *rydbergi*

Western Poison Ivy

1. Usually a single-stemmed shrub, sometimes sparingly branched, less than 3' tall.
2. Deciduous.
3. Twigs — smooth, light tan or cream colored, glabrous or sparsely hairy, not angled at nodes, aerial rootlets present on vine-like forms.
4. Lenticels — conspicuous (dark-colored), quite numerous.
5. Pith — round, continuous.
6. Buds — alternate, several-scaled, hairy, tan colored, pointed, short-stalked.
7. Leaf scars — large, prominent crescent-shaped.
8. Bundle scars — 5.
9. No stipule scars.
10. Fruit — berry-like, globular, striate, white or cream colored. Eaten by birds and deer.
11. Usually along creeks, valley bottoms and road cuts. Widely distributed under ponderosa pine in southern Black Hills and on north exposures in Nebraska sandhills. Throughout Rocky Mountain region but common only locally. Poisonous to touch, though some persons are immune.

ELM



Leaves of Chinese elm  
(two surfaces), x  $\frac{2}{3}$



Winter twig, x  $\frac{2}{3}$



Enlarged bud (American elm), x 3



Bud and leaf scar  
(Chinese elm), x 1

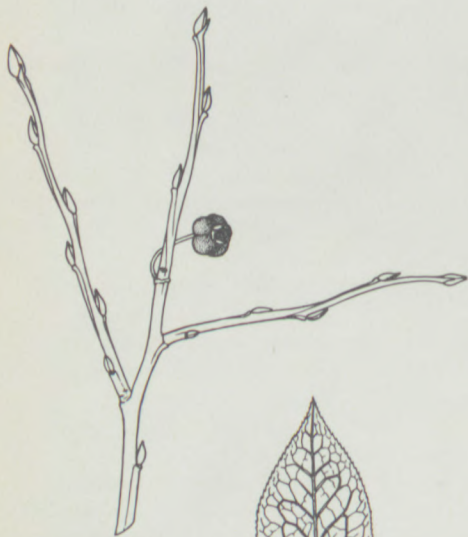


### 101. *Ulmus* spp.

#### American Elm and Chinese Elm

1. **Trees** becoming of moderate to large size.
2. **Deciduous**.
3. **Leaves** — simple, alternate, prominently pinnately-veined, margins simple or doubly serrate; unequal (lopsided) and oblique at the base.
4. **Twigs** — slender, zig-zag, round, usually pubescent, glabrous in older stems, red-brown.
5. **Lenticels** — pale, round, or elliptical, numerous.
6. **Pith** — small, round, continuous, whitish.
7. **Buds** — terminal lacking, lateral  $\frac{1}{8}$ " to  $\frac{1}{2}$ " long, 2-ranked many scaled, ovoid, acute, brown; scales (*U. americana*) tomentulose on margins, with short sparse hairs elsewhere.
8. **Leaf scars** — slightly raised, half round or shield-shaped.
9. **Bundle scars** — 3 or compounded in 3 distinct groups.
10. **Stipule scars** — distinct, pale, moderate sized, unequal — the long one under the bud.
11. **Fruits** — seldom present in winter. Ovoid winged samaras on slender drooping pedicels.
12. **Probably not native** in Rocky Mountain region but widely grown here as shade trees and in shelterbelts. American elm may enter the area from the east along rivers and creeks. It is unpalatable to livestock and game except under severe winter conditions or confinement. Chinese elm is generally more palatable.

MYRTLE WHORTLEBERRY



Winter twig with  
solitary fruit, x  $\frac{2}{3}$



Leaf, x  $1\frac{1}{2}$



Enlarged valvate buds  
and leaf scar, x 4

102. *Vaccinium myrtillus*

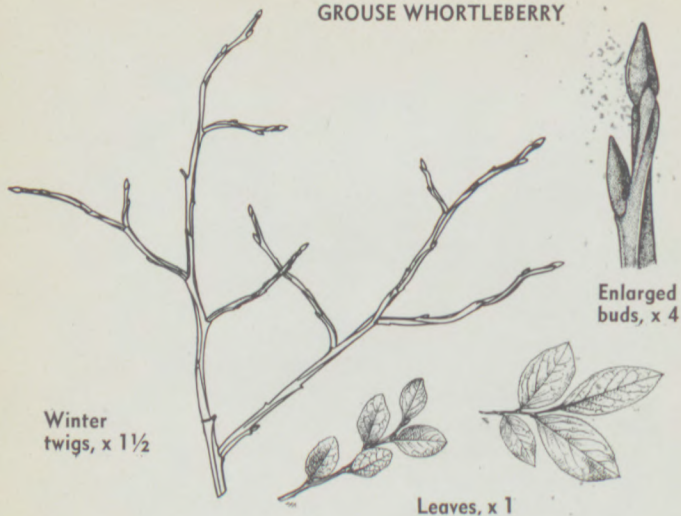
(*V. oreophilum*)

Myrtle Whortleberry,

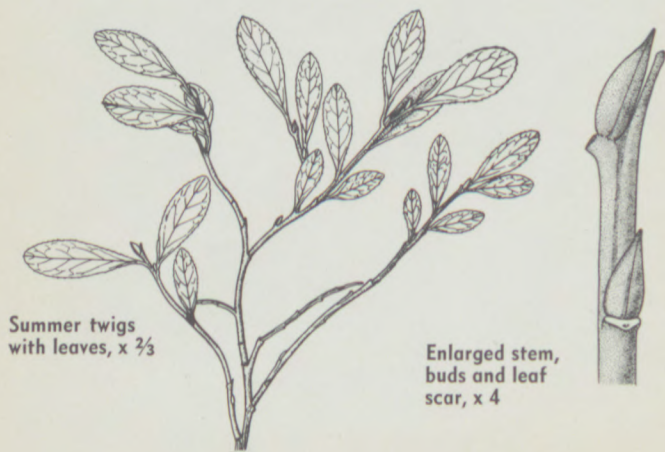
Rocky Mountain Whortleberry

1. **Low shrub** up to 1' tall.
2. **Leaves** — deciduous, larger ones up to 1" long.
3. **Twigs** — round or more or less angled in cross section; arrangement not broom-like.
4. **Lenticels** — inconspicuous.
5. **Pith** — very small, brown.
6. **Buds** — alternate, green with 2 valvate scales.
7. **Leaf scars** — small, raised, half round.
8. **Bundle scars** — 1.
9. **No stipule scars.**
10. **Fruit** — a blue-black or black berry, used as food by birds and animals.
11. **Common in higher elevations** of Colorado and Wyoming under spruce timber and aspen. Browsed by deer, moose, elk in summer and fall.

GROUSE WHORTLEBERRY



DWARF BLUEBERRY





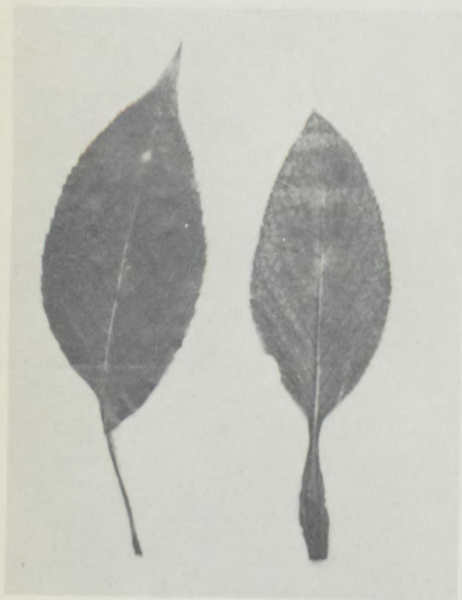
103. *Vaccinium scoparium*  
Grouse Whortleberry

1. Low shrub 6"-8" tall.
2. Leaves — deciduous, small, less than  $\frac{1}{3}$ " long.
3. Twigs — green, square or sharply angled in cross section; arrangement broom-like.
4. Lenticels — inconspicuous.
5. Pith — very small, brown.
6. Buds — alternate, green, with 2 valvate scales.
7. Leaf scars — small, raised, half round.
8. Bundle scars — 1.
9. No stipule scars.
10. Fruit — a red berry, used as food by birds and animals.
11. Very common in Rocky Mountain region under timber and aspen and on burns at medium to high elevations. Browsed by deer and elk on summer and fall ranges. *V. caespitosum* or dwarf blueberry also occurs in the mountains throughout the region at 8,500 to 12,000 feet. It has round, glabrous stems; fruit is blue with a bloom; leaves obtuse or acute (see illustration).

NANNYBERRY



Enlarged winter twig  
with valvate terminal  
flower buds, x 2



Leaves (two surfaces), x 1

## Key to the Species of *Viburnum*

Twigs scurfy or with glaucous bloom, buds elongate tapered, purplish-gray .....104. Nannyberry  
*V. lentago*

Twigs glabrous; buds ovoid globose, green or red .....  
...105 & 106. European and American Highbush Cranberry  
*V. opulus* and *V. pauciflorum*

### 104. *Viburnum lentago*

#### Nannyberry

1. **Shrub** — sometimes small tree 15'-30' tall.
2. **Deciduous.**
3. **Bark** — of trunk reddish brown and irregularly broken into small, thick plates divided on their surface into minute thin appressed scales.
4. **Twigs** — glabrous or nearly so but with a glaucous bloom, tan to brown, older twigs reddish, brown; 4-ridged.
5. **Lenticels** — small, rounded or oval, raised, buff.
6. **Pith** — round, continuous, light colored.
7. **Buds** — elongate tapered, purplish-gray; outer bud scales 2, valvate; terminal flower buds swollen near base.
8. **Leaf scars** — opposite, narrow, nearly encircling twig.
9. **Bundle scars** — 3, prominent.
10. **No stipule scars.**
11. **Fruit** — clusters of drupes (appearing like berries), individual drupe oval, black with bluish bloom, the stone nearly circular and very flat. Used as food by birds, but bitter tasting.
12. **Wood ill scented.**
13. **Stream banks and moist places** at lower and medium elevations from northern Colorado (one record) to Wyoming and Black Hills. Rather scarce. Not valuable as a browse for livestock but taken to a limited extent by deer.

EUROPEAN CRANBERRYBUSH



Leaf, x 1



Enlarged winter twig  
with sac-like bud  
and persistent petiole  
base, x 2



105. *Viburnum opulus*  
European Cranberrybush

1. **Large shrub 3'-9' tall.**
2. **Deciduous.**
3. **Leaves** — broadly ovate, 3-ribbed and 3-lobed, the lobes acuminate, coarsely dentate, glabrous or sparsely pubescent above and on veins beneath.
4. **Twigs** — glabrous, nearly erect, somewhat angled.
5. **Pith** — whitish to tan, moderate to large, continuous, often angled.
6. **Buds** — solitary, ovoid, globose, green or red, glabrous, scales closely valvate like a sack.
7. **Leaf scars** — opposite, narrow, connected by a transverse ridge.
8. **Bundle scars** — 3.
9. **Stipule scars** — none.
10. **Fruit** — cluster of persistent drupes, individual fruit bright red with a single large flattened seed; very acid.
11. **Probably escaped from cultivation in northern Black Hills**, usually along streams or gulch bottoms. Fruits taken by birds, but the shrub is not important as a browse plant.

MOOSEBERRY VIBURNUM



Winter twig,  
x 1



Leaves, x 1

106. *Viburnum pauciflorum*

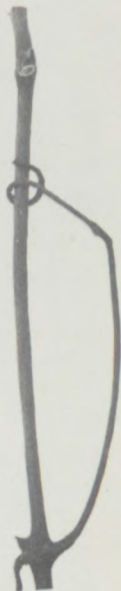
Mooseberry Viburnum, American Cranberrybush

1. **Medium sized shrub 3'-6' tall.**
2. **Deciduous.**
3. **Leaves** — roundish or broadly oval, occasionally elliptic; 3 lobed the lobes not as deeply cut as *V. opulus*, acute at apex; usually 3 palmate veins; margins unequally dentate; petioles bearing little appendages — apparently stipules, glabrous above, more or less pubescent on margins and veins beneath.
4. **Winter characters** very similar to *V. opulus*.
5. **North central and central Colorado** at 7,000' to 9,000' northward.

FROST GRAPE



Leaves (two surfaces) and fruit, x  $\frac{1}{4}$



Branch with bud,  
tendril and leaf  
scar, x  $\frac{1}{4}$



107. *Vitis vulpina*  
Frost Grape

1. **Vine.**
2. **Deciduous.**
3. **Old bark** — shreddy, dark brown to grayish.
4. **Branches** are long, slender and climbing by means of tendrils, bark smooth, light brown or tan.
5. **Lenticels** — inconspicuous.
6. **Pith** — round or oval, brown, continuous except for partitions at nodes.
7. **Buds** — alternate, medium sized, tan, short, blunt, smooth (hairy under outer scales), scales 2 to 4.
8. **Leaf scars** — alternate (tendrils usually opposite the buds).
9. **Bundle scars** — several, indistinct.
10. **Stipule scars** — narrow.
11. **Fruit** — clusters of berries — typical of grapes.
12. **Stream banks and valley bottoms** at lower elevations in northern and central Colorado to northern Wyoming, Black Hills and Nebraska. Rather scarce; fruit eaten by birds and used to make jelly.

# SUMMER KEY

## KEY TO THE GENERA OF SOME COMMON SHRUBS OF THE CENTRAL ROCKY MOUNTAIN REGION, USING SUMMER CHARACTERISTICS

- |  |  |
|--|--|
| 1. Leaves small, scale-like .....  | 2  |
| Leaves not small nor scale-like .....  | 4  |
| 2. Plants lacking chlorophyll; parasitic   |  |
| on conifers .....  | <b>Mistletoe</b> <sup>1</sup>            |
|  | <b>Arceuthobium &amp; Phoradendron</b>   |
| Plants with chlorophyll; not parasitic .....   | 3  |
| 3. Stems green; leaves opposite  |  |
| or whorled .....   | <b>40.</b> <sup>2</sup> — <b>Ephedra</b> |
|  | <b>Ephedra</b>                           |
| Stems not green; leaves alternate and<br>green .....   | <b>96.</b> — <b>French Tamarisk</b>      |
|  | <b>Tamarix</b>                           |
| 4. Leaves all basal, stiff, 8" or more long,<br>tapering to a sharp point, several times<br>longer than wide ..... | <b>11.</b> — <b>Yucca</b>                |
|  | <b>Yucca</b>                             |
| Leaves not as above .....  | 5  |
| 5. Leaves opposite or whorled (two or more<br>at a node) .....   | 6  |
| Leaves alternate (one at a node — or<br>several on one side) .....   | 29                                       |

<sup>1</sup>Three species unnumbered in this key are not described in the text. These are: Mistletoe, Labrador tea, and Yucca.

<sup>2</sup>Numbers in this position refer to plant description numbers.

## Opposites

- |   |   |  |
|---|---|--|
| 6. Vine .....   | 30. — Western Virginsbower<br><b>Clematis</b>   | 7  |
|   | Shrub or tree .....   | 8  |
| 7. Leaves compound .....  |   | 11   |
|   | Leaves simple .....   |  |
| 8. Leaflets 2; plants with creosote<br>odor .....                           | 34. — Creosotebush<br><b>Covillea</b>   | 9  |
|   | Leaflets more than 2 .....  |  |
| 9. Pith of older stems more than ½ diameter<br>of stem .....                | 89. — Elder<br><b>Sambucus</b>  | 10   |
|   | Pith of older stems less than ½ diameter of stem..  |  |
| 10. Leaflets ovate, acute, dentate.....                                     | 2. — Boxelder<br><b>Acer negundo</b>  | 14   |
|   | Leaflets lanceolate to elliptic, acuminate<br>at both ends, margin entire<br>or serrate ..... | 48. — Green Ash<br><b>Fraxinus pennsylvanica</b> |
| 11. Evergreen; at least some leaves remaining<br>on last year's twigs ..... |   | 12   |
|   | Deciduous; leaves not present on last<br>year's twigs .....                                   | 14   |
| 12. Leaves gray-green; margins entire .....                                 |   | 13   |
|   | Leaves green, smooth; margins<br>finely serrate .....   | 59. — Myrtle Pachistima<br><b>Pachistima</b>     |
|   | Leaves green, smooth; margins smooth,<br>somewhat revolute .....                              | 53. — Bog Kalmia<br><b>Kalmia polifolia</b>      |
| 13. Leaves scurfy .....   | 14.-16. — Saltbush<br><b>Atriplex</b>   |  |

- Leaves hairy (appressed hairs) .....31. — Blackbrush  
**Coleogyne**
14. Leaf margins entire, or nearly so ..... 15  
Leaf margins definitely serrate, dentate, incised, etc. .... 23
15. Leaf surfaces mealy, scurfy or scaly ..... 16  
Leaf surfaces smooth or hairy ..... 17
16. Leaves covered with shield-shaped (peltate) scales .....91.-92. — Buffaloberry  
**Shepherdia**
- Leaves scurfy-mealy;  
no peltate scales .....14.-16. — Saltbush  
**Atriplex**
17. Leaves narrow, linear ..... 18  
Leaves broad, width at least  $\frac{1}{3}$  the length ..... 19
18. Leaves in pairs .....44. — Cliff Fendlerbush  
**Fendlera**
- Leaves in groups (fascicled) of  
more than 2 .....31. — Blackbrush  
**Coleogyne**
19. Transverse connecting ridge (at nodes) present... 20  
Transverse connecting ridge (at nodes)  
absent .....47. — Singleleaf Ash  
**Fraxinus anomala**
20. Leaves mostly lanceolate to ovate, with acuminate tips — average length, 1"-1½"  
for **Cornus**; 2"-3" for **Lonicera** ..... 21  
Leaves mostly ovate, with acute or obtuse tips,  
average length 2" or less ..... 22
21. Leaves with ciliate margins; stems tan or cream-colored ..54. — Bearberry Honeysuckle  
**Lonicera**
- Leaves without ciliate margins;  
stems red .....32. — Redosier Dogwood  
**Cornus stolonifera**



22. Leaves 3-nerved from  
the base .....62. — Littleleaf Mockorange  
**Philadelphus**  
Leaves with only one main  
nerve from base .....95. — Snowberry  
**Symphoricarpos**
23. Leaf margins incised; palmately-  
veined .....1. — Rocky Mountain Maple  
**Acer**  
Leaves serrate or dentate, but not incised  
or palmately veined ..... 24
24. Twigs with transverse connecting ridge  
(at nodes) ..... 25  
Twigs without transverse connecting ridge  
(at nodes) ..... 26
25. Leaves white-hairy underneath; margins  
serrate .....52. — Cliff Jamesia  
**Jamesia**  
Leaves not hairy underneath; margins  
dentate .....104.-106. — Highbush Cranberry  
**Viburnum**
26. Leaves 1" or more wide ..... 27  
Leaves less than 1" wide ..... 28
27. Stipules present on  
new growth .....78. — Buckthorn  
**Rhamnus**  
Stipules absent .....47.-48. — Ash  
**Fraxinus**
28. Leaves narrowly ovate-elliptic; teeth on margins  
small, close together .....78. — Buckthorn  
**Rhamnus**  
Leaves oblanceolate, teeth on margins  
small, but farther apart  
than above .....45. — New Mexican Forestiera  
**Forestiera**

## Alternates

29.	Vines .....	30
	Shrubs or trees .....	31
30.	Leaves simple .....107. — Frost Grape	
	<b>Vitis</b>	
	Leaves compound .....60. — Virginia Creeper	
	<b>Parthenocissus</b>	
31.	Leaves simple .....	41
	Leaves compound .....	32
32.	Prickly or spiny plants .....	33
	Plants without spines or prickles (leaflets may be spined) .....	35
33.	Plants with prickles .....	34
	Shrub or small tree with straight or curved, smooth spines; 15-21 oblong-elliptic leaflets, entire margins ....83. — New Mexican Locust	
	<b>Robinia</b>	
34.	Leaflets mostly 5-9; base of prickle greatly enlarged .....84. — Rose	
	<b>Rosa</b>	
	Leaflets mostly 3; base of prickle not greatly enlarged .....87. — Red Raspberry	
	<b>Rubus idaeus</b>	
35.	Leaflets toothed or lobed .....	36
	Leaflets not toothed or lobed .....	39
36.	Leaflets 3-5; with spiny-toothed margins .....55.-56. — Mahonia	
	<b>Mahonia</b>	
	Leaflets without spiny-toothed margins .....	37
37.	Leaflets 3 (rarely 5-7); characteristic odor .....81. — Skunkbush Sumac	
	<b>Rhus trilobata</b>	
	Leaflets 9-17; no outstanding odor .....	38
38.	Leaves with reddish or purplish petioles; leaflets mostly lance-shaped, pointed, with	

large, forward-pointing, rounded teeth;  
 leaflets 2-4" long .....80. — Smooth Sumac

**Rhus glabra**

Petioles not reddish; leaflets mostly oval to  
 elliptic, with rounded apex, and close-set,  
 sharp, forward-pointing teeth; leaflets  
 about 1" long .....93. — Greene's Mt. Ash

**Sorbus**

39. Leaflets 3, with numerous translucent dots,  
 strong odor, Southwestern  
 Colorado .....74. — Baldwin Hoptree

**Ptelea**

Leaflets more than 3 ..... 40

40. Leaflets 5-7, soft, hairy ...69. — Bush Cinquefoil  
**Potentilla**

Leaflets 11-51, rounded or oval-elliptic,  
 with midrib prolonged to short  
 bristle .....5.-7. — Leadplant or Indigobush

**Amorpha**

41. Leaf margins entire ..... 42  
 Leaves lobed or toothed (may be both) ..... 62
42. Thorns, spines, or prickles present ..... 43  
 Thorns, spines, or prickles absent ..... 49
43. Leaves narrow, oblong, or linear (mostly  
 less than 1" long) ..... 44  
 Leaves ovate, or spatulate and less than 1"  
 long; or if narrow, more than 1" long ..... 47
44. Stems and spines green, smooth; leaves narrow  
 elliptic, ¼" long .....46. — Spiny Greasebush  
**Forsellesia**

Plant not as above ..... 45

45. Leaves narrow, fleshy, somewhat 3-angled;  
 bark grayish-white; many short  
 leafy spines .....90. — Black Greasewood  
**Sarcobatus**

- Leaves not fleshy or 3-angled ..... 46
46. Leaves linear, smooth,  $\frac{1}{2}$ -1" long; white wooly  
thorns .....97. — Cottonthorn Horsebrush  
**Tetradymia spinosa**
- Leaves oblong; thorns reddish-brown or  
greenish, not wooly ..22. — Fendler Ceanothus  
**Ceanothus fendleri**
47. Leaves lanceolate, green above, silvery  
beneath; older stems reddish-brown, new  
branchlets silvery  
(not native) .....38. — Russian Olive  
**Elaeagnus angustifolia**
- Leaves not as above ..... 48
48. Leaves wedge-shaped or spatulate.
- A. Older stems with shreddy bark, new  
twigs slightly mealy or smooth; leaves  
single, fleshy, somewhat mealy or  
smooth, gray-green; spines spur-like  
and beset with buds, scattered,  
 $\frac{1}{2}$  to  $\frac{3}{4}$ " long.....50. — Spiny Hopsage  
**Grayia spinosa**
- B. All stems smooth and shining as if  
varnished; leaves fascicled, smooth,  
green; spines thin, sharp at nodes,  
 $\frac{1}{4}$  to  $\frac{1}{2}$ " long....18. — Colorado Barberry  
**Berberis fendleri**
- Leaves ovate or obovate, closely clustered on  
plant; bark not shreddy; entire plant  
white scurfy .....15. — Shadscale Saltbush  
**Atriplex confertifolia**
49. Plants with glandular swellings on stems;  
broom-like, desert plants, narrow leaves,  
 $\frac{1}{16}$ -1" long; early  
deciduous .....Texas Desert Rue  
**Thamnosma**



Plants without glandular swellings .....	50
50. Leaves lanceolate to elliptic; silvery-scaly on both sides; fruit fleshy, with an 8 ridged stone .....	39. — Silverberry
	<b>Elaeagnus commutata</b>
Leaves not silvery-scaly on both sides; fruit not as above .....	51
51. Leaf margins entire, rolled under (revolute) .....	52
Leaf margins not rolled under .....	57
52. Leaves wooly, not leathery .....	53
Leaves leathery, not wooly .....	54
53. Leaves mostly fascicled; plants with white or reddish color .....	42. — Common Winterfat
	<b>Eurotia lanata</b>
Leaves mostly single; plants with dark gray color .....	97. — Gray Horsebrush
	<b>Tetradymia canescens</b>
54. Leaves needle-like; ¼-½" long, densely clothing the branches; a low, alpine shrub .....	63. — Red Mountainheath
	<b>Phyllodoce</b>
Leaves not as above .....	55
55. Lower leaf surface whitish, resin-dotted .....	<sup>1</sup> Labrador Tea
	<b>Ledum</b>
Lower leaf surface not resin-dotted .....	56
56. Low, sub-alpine shrubs .....	53. — Kalmia
	<b>Kalmia</b>
Tall, foothills shrubs .....	27. — Curlleaf Mt. Mahogany
	<b>Cercocarpus ledifolius</b>
57. Plants with single bud scale — in axil of leaf .....	88. — Willow
	<b>Salix</b>
Plants with more than one bud scale .....	58

58. Leaves leathery,  
evergreen ...8.-9. — Bearberry and Manzanita  
**Arctostaphylos**  
Leaves not leathery ..... 59
59. Plants with sage odor .....10.-14. — Sagebrush  
**Artemisia**  
Plants without sage odor ..... 60
60. Plants scurfy,  
scaly .....14.-16. — Saltbush  
**Atriplex**  
Plants not scurfy, scaly ..... 61
61. Leaves narrowly linear, less than  
 $\frac{1}{4}$ " wide .....29. — Rabbitbrush  
**Chrysothamnus**  
Leaves elliptic, more than  $\frac{1}{4}$ "  
wide .....79. — Rhododendron or Azalea  
**Rhododendron**
62. Plants with sage odor .....10.-14. — Sagebrush  
**Artemisia**  
(A. *tridentata* most common of 3-lobed leaf group)  
Plants without sage odor ..... 63
63. Thorns, spines, or prickles present ..... 64  
Thorns, spines, or prickles absent ..... 66
64. Plants usually with spiny-toothed  
leaves .....18. — Colorado Barberry  
**Berberis fendleri**  
Plants without spiny-toothed leaves ..... 65
65. Leaves broadly 3-5 lobed; lobes with rounded  
teeth .....82. — Currants & Gooseberries  
**Ribes**  
Leaves slightly lobed, coarsely-toothed or  
sometimes finely-toothed; teeth sharp-  
pointed; spur-like thorns .....36. — Hawthorn  
**Crataegus**
66. Leaves palmately-veined ..... 67  
Leaves pinnately-veined ..... 69

67. Stipules present; pith continuous ..... 68  
 Stipules absent; pith with cavities  
 (spongy) ....82. — Currants and Gooseberries  
**Ribes**
68. Bark on older stems shreddy; flower small,  
 less than 1/2", fruit a small dry  
 capsule .....64. — Ninebark  
**Physocarpus**  
 Bark not shreddy; flowers large, over 1/2",  
 showy; fruit fleshy, raspberry-  
 like .....86. — Western Thimbleberry  
**Rubus parviflorus**
69. Leaves lobed, or divided into long, slender  
 divisions (filiform) ..... 70  
 Leaves not lobed (except 3-lobed in **Purshia**)  
 — may be widely dentate ..... 73
70. Leaves 3-5 parted into filiform divisions, the  
 division 1 1/2-3" long; stems finely ridged  
 (striated) .....58. — Prickly Oxytenia  
**Oxytenia**  
 Leaves not parted into long filiform divisions;  
 stems not striated ..... 71
71. Leaves over 2" long; lobes broad,  
 pith star-shaped .....76.-77. — Oak  
**Quercus**  
 Leaves less than 1" long; lobes narrow,  
 pith not star-shaped ..... 72
72. Plant sticky; lobes  
 short .....35. — Stansbury Cliffrose  
**Cowania**  
 Plant not sticky; lobes  
 linear .....43. — Apache Plume  
**Fallugia**
73. Leaves 2-ranked on normal twigs ..... 74  
 Leaves not 2-ranked ..... 78

74. Pith chambered .....26. — Hackberry  
**Celtis**  
 Pith not chambered ..... 75
75. Bark of older branches brown or reddish-  
 brown, usually in papery layers; twigs  
 with gummy excretions .....19.-21. — Birch  
**Betula**  
 Bark not papery; twigs without  
 gummy excretions ..... 76
76. Leaves lop-sided (oblique) at base...101. — Elm  
**Ulmus**  
 Leaves not oblique at base ..... 77
77. Leaves toothed only toward  
 apex .....4. — Serviceberry  
**Amelanchier**  
 Leaves doubly serrate on sides  
 and apex .....3. — Thinleaf Alder  
**Alnus**
78. Leaves very small, with 3 teeth  
 at apex .....75. — Antelope Bitterbrush  
**Purshia**  
 Leaves larger; teeth more than 3 ..... 79
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FIGURE 2. LEAF PATTERNS



*Leaf Shapes*

- 1-Lanceolate. 2-Oblanceolate. 3-Oblong.  
4-Elliptical. 5-Oval. 6-Ovate. 7-Orbicular.  
8-Subulate. 9-Acicular. 10-Linear.

*Leaf Margins*

- 1-Serrate. 2-Crenate. 3-Entire. 4-Dentate.  
5-Sinuate. 6-Doubly serrate. 7-Lobed.

*Leaf Apices*

- 1-Acuminate. 2-Rounded. 3-Emarginate.  
4-Obtuse. 5-Mucronate. 6-Acute.

*Leaf Bases*

- 1-Obtuse. 2-Cuneate. 3-Rounded. 4-Acute.  
5-Rounded. 6-Cordate. 7-Truncate.

*Leaf Types*

- 1 to 10-Simple leaves.  
11-Pinnately compound leaf.

# GLOSSARY

## ACHENE

— a small, dry, indehiscent, one-celled, one-seeded fruit consisting usually of a single carpel.

## ACUMINATE

— drawn out at the apex into a gradually tapering point.

## ACUTE

— terminating in a sharp or well-defined point.

## ANGLED AT NODES

— bent; not straight.

## APICULATE

— ending in a short, sharp, abrupt, rather soft tip; said often of leaves, leaflets, and sepals which have the midrib prolonged a little into a short, somewhat awnlike but not rigid tip.

## APPRESSED

— lying close to or flat against.

## AROMATIC

— yielding a fragrant odor.

## BASAL

— attached at the base.

## BRACT

— a much-reduced leaf, usually subtending a flower.

## BUD SCALE

— a modified leaf forming part of the protective covering of a leaf bud or flower bud.

## BUNDLE SCAR

— marks indicating the broken ends of vascular bundles,



these being variously arranged on a leaf scar.

**CANESCENT**

—having a heavy, grayish pubescence of short hairs.

**CAPSULE**

—a dry, dehiscent fruit composed of more than one carpel.

**CARPEL**

—a simple pistil; the modified leaf from which the ovary is formed; also, a part of a compound ovary.

**CATKIN**

—a spike of inconspicuous and usually unisexual flowers, as in willows and birches.

**CHAMBERED (pith)**

—divided into segments by distinct cross walls.

**CHLOROPHYLL**

—the complex nitrogenous substance, occurring only in cellular structures exposed to light and containing iron, responsible for the green color in plants.

**CILIATE**

—marginally fringed with hairs.

**COLLATERAL**

—situated at the side of something.

**COMPOUND**

—divided into a number of similar parts, as the leaflets of compound leaves.

**CONTINUOUS (pith)**

—not divided into segments.

**CORYMB**

—a convex or flat-topped open flower cluster, with the pedicels arising from different points on the stem, as in yarrow (*Achillea*).

**DECIDUOUS**

—falling off at the end of a growing season; not persistent or evergreen.

**DECURRENT**

—referring to the bases of leaves which sometimes

continue down the stem beyond the point of attachment.

**DEHISCENT**

— splitting open at maturity.

**DENTATE**

— toothed, with the teeth directed outward.

**DIFFUSELY BRANCHED**

— branches scattered and widely spread.

**DIFFUSE POROUS**

— having pores scattered throughout the stem.

**DIOECIOUS**

— literally, in two houses. The staminate (male) and pistillate (female) flowers borne on different individual plants.

**DIVERGENT**

— spreading apart, curving away from the main axis.

**DRUPE**

— the fruit of cherry or plum, a fleshy one-seeded fruit in which the seed is enclosed in a hard stone.

**ELLIPTIC**

— having the shape of an ellipse.

**ENTIRE**

— without marginal teeth.

**EPIDERMIS**

— the thin layer of cells forming the external integument in seed plants and ferns.

**EXCRESCENCES**

— an abnormal or a normal outgrowth as a wart or an appendage.

**FASCICLE**

— a dense or close bundle or cluster, especially of like organs having a common source.

**FILIFORM**

— thread-like.

**FOLLICLE**

— a capsule or pod, matured from a simple pistil, and

opening along one suture, as in milkweed.

**GLABROUS**

— smooth, without hairs.

**GLAUCOUS**

— having a bloom or whitish covering on the stem or leaf.

**GLOBOSE**

— spherical.

**HEARTWOOD**

— the hard, tough inner wood in a tree trunk; duramen.

**IMBRICATE**

— overlapping like shingles.

**INDEHISCENT**

— not splitting open at maturity.

**INCISED**

— cut sharply, deeply, and irregularly into lobes or segments.

**INFLORESCENCE**

— flower cluster.

**INTERNODE**

— the portion of a stem between two nodes.

**INVOLUCRE**

— a circle or cluster of bracts at the base of a flower — cluster, sometimes fused into a cup.

**INVOLUTE**

— having the edges rolled inward.

**IRREGULAR**

— showing inequality in the size, shape, or arrangement of the parts.

**LANCEOLATE**

— lance-shaped, long and narrow but broadest at the base.

**LEAF SCARS**

— marks indicating the points of attachment of fallen

leaves to the stem.

**LENTICELS**

—wart-like, usually light colored, spots on the bark of twigs.

**LINEAR**

—long and narrow, with parallel margins.

**LONGITUDINAL**

—placed or running lengthwise.

**MONOECIOUS**

—having the staminate (male) and pistillate (female) flowers in separate inflorescences, but borne on the same individual plant, as distinguished from dioecious.

**NODE**

—a point on a stem where one or more leaves are attached.

**OBLANCEOLATE**

—reverse lance shaped (lanceolate); with the narrowed, tapering part downward, and the broader end foremost.

**OBLONG**

—about two to four times longer than broad, and with the sides, though gently rounded, approximately parallel.

**OBOVATE**

—reverse egg shaped (ovate) with the broader end forward or uppermost.

**OVATE**

—egg shaped and broadest at the base.

**OVOID**

—shaped like a hen's egg and with the broader end downward or innermost. Used to describe solid or 3-dimensional parts, as a fruit.

**PALMATELY-VEINED**

—having veins which radiate from a single point, as maple leaves.



**PANICLE**

— a repeatedly branched inflorescence with pedicelled flowers.

**PAPPUS**

— the modified calyx of composites, usually composed of bristles and awns. Example—“parachute” of a dandelion flower.

**PARENCHYMA**

— thin-walled cells visible with a hand lens on cross-section of wood as sheaths about pores, or as broken or continuous whitish lines on bands.

**PELTATE**

— shield shaped; a peltate leaf, as in nasturtium has the petiole attached somewhere near the center of the blade.

**PETIOLE**

— a leaf stalk.

**PETIOLULE**

— the stalk of a leaflet corresponding to the petiole of a leaf.

**PINNATELY-VEINED**

— having veins in the form of a feather, i.e. with one main axis having lateral offshoots.

**PISTILLATE**

— female, bearing pistils or seed producing organs only.

**PITH**

— the spongy center of a stem, surrounding or joining to the inner part of the vascular bundles.

**POME**

— the fruit of apples and their relatives.

**POROUS**

— having tiny holes or tubes through which a fluid may pass.

**PRICKLES**

— a small, usually slender outgrowth of the young bark, coming off with it, c.f. spine and thorn.

**PROCUMBENT**

—lying or trailing on ground but usually not rooting at nodes.

**PROSTRATE**

—lying on the surface of the ground, said especially of stems, may or may not root.

**PUBERULENT**

—very minutely pubescent.

**PUBESCENT**

—hairy; technically, covered with short soft hairs.

**PUNCTATE**

—dotted with depressions, or with translucent inter-nal glands or colored dots.

**RACEME**

—an elongated inflorescence with a single main axis along which single stalked flowers are arranged. Compare with panicle, spike, and cyme.

**RECEPTACLE**

—the axis or support of a flower or flower head; the somewhat enlarged end of the flower stalk upon which numerous flowers or the organs of a flower are borne.

**RENIFORM**

—kidney shaped — bean shaped.

**REVOLUTE**

—having the margins rolled back or under; opposite of involute.

**RING POROUS**

—having pores arranged in a ring in the stem.

**SAMARA**

—an indehiscent winged fruit, such as that of maple.

**SAPWOOD**

—the layer of softer wood consisting of living tissues, between the bark and the heartwood of most trees, containing more sap than the heartwood; alburnum.

**SCURFY**

— covered with small scalelike or branlike particles.

**SEPAL**

— one of the parts of the outer whorl of the floral envelope or calyx, usually green in color.

**SERRATE**

— with sharp teeth directed forward.

**SERRULATE**

— minutely serrate.

**SESSILE**

— lacking a stalk.

**SIMPLE LEAF**

— of one piece, opposed to compound leaf.

**SPATULATE**

— broad and rounded at the apex and with a narrowed relatively short base.

**SPIKE**

— an elongated flower cluster in which the flowers are sessile, i.e. without individual stalks. Wheat, spearmint, and mullein are examples.

**SPINES**

— a sharp-pointed, rigid, deep-seated emergence from a plant. Spines differ from prickles in not pulling off with the bark; they differ from thorns by absence of vascular tissue.

**SPINESCENT**

— bearing a spine or ending in a spinelike sharp point.

**SPUR SHOOTS**

— short stubby branches with greatly crowded leaf scars and very slow growth.

**STAMINATE**

— having stamens but not carpels.

**STIPULES**

— small, leaf-like organs occurring in pairs on either side of the leaves at the base of the petiole.

**STOLON**

— a trailing or reclining branch, above ground, which

strikes root where it touches the soil there sending up new shoots which, later, become separate plants.

**STIPULE SCARS**

—small marks left by the deciduous stipules.

**STRIATED**

—marked by slender, longitudinal grooves or furrows.

**SUPERPOSED**

—said of extra buds which appear above the true axillary buds.

**TENDRILS**

—slender clasping or twining outgrowth of stems or leaves.

**TERETE**

—cylindrical; circular in cross-section.

**THORN**

—sharp-pointed, usually vascular, outgrowths of the twig, which represent modified branches; usually bearing leaf scars, or branched.

**TOMENTUM**

—densely matted, woollike hairs.

**TOMENTULOSE**

—sparingly or minutely tomentose.

**TRANSVERSE**

—lying or being across. Opposite of longitudinal.

**UMBEL**

—an inflorescence in which the pedicels radiate from a single point, like the spokes of an umbrella.

**VALVATE**

—applied to bud scales which meet along a definite, usually longitudinal line without overlapping; the reverse of imbricate.

**WHORLED**

—said of leaves or leaf scars which occur three or more at a node.



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