



United States
Department of
Agriculture

Forest Service

Pacific Southwest
Forest and Range
Experiment Station

General Technical
Report PSW-99



Common Shrubs of Chaparral and Associated Ecosystems of Southern California

C. Eugene Conrad



The Author:

C. Eugene Conrad was formerly in charge of the research unit in the Station's research and development program titled "Vegetation Management Alternatives for Chaparral and related Ecosystems," headquartered at the Forest Fire Laboratory, Riverside, Calif. He presently heads the Forest Management Research Unit at Honolulu, Hawaii. He earned bachelor's (1956) and master's (1959) degrees from Oregon State University. He joined the Forest Service and Station's research staff in 1961.

Acknowledgments:

The list of people who contributed to this guide is longer than can be given here but I especially thank Timothy P. Kranz. With funding from the San Bernardino National Forest, Tim originally wrote basic descriptions of many of the species and identified key characteristics. In addition, dozens of professional and non professional workers tested the species key and made excellent suggestions. The final was based on these contributions and those of Dr. Robert Thorne and Dr. Ted L. Hanes who reviewed the entire manuscript and made many critical comments for which I am grateful. Regardless of all of the help, I accept full responsibility for the content.

The Chaparral Research and Development Program, under joint sponsorship of the Pacific Southwest Forest and Range Experiment Station and the Forest Service Pacific Southwest Region, expanded the project. The following authors and their publishers granted permission to reproduce illustrations: LeRoy Abrams, *Illustrated Flora of the United States* (Stanford University Press, 1960); Philip A. Munz, *A Flora of Southern California* (University of California Press, 1974); and Howard E. McMinn, *Illustrated Manual of California Shrubs* (University of California Press, 1939). Kaaren Spooner provided several new illustrations and Anthony P. Gomez prepared photographs of all of the illustrations. I thank the word processing typists at the Forest Fire Laboratory for the difficult job of formatting and typing the original manuscript. The editorial assistance provided by Betty J. Lusk is very much appreciated. Completion of the project was assisted by careful and diligent help from the Station editor and production staff.

Publisher:

**Pacific Southwest Forest and Range Experiment Station
PO. Box 245, Berkeley, California 94701**

July 1987

Common Shrubs of Chaparral and Associated Ecosystems of Southern California

C. Eugene Conrad

CONTENTS

Introduction	1
Plants Included in the Guide	2
How to Use the Vegetative Keys	2
Glossary	3
Vegetative Key to Common Southern California	
Shrubs	6
Species Descriptions	15
References	76
Appendix A: Southern California Shrub and Subshrub Vegetation Excluding Desert Genera	78
Appendix B: Index to Species	85

INTRODUCTION

California is especially rich in plant species, subspecies, and varieties. Stebbins and Major (1965) reported more than 4000 species in California, one-third of these endemic. Such richness is largely attributable to the extreme diversity of habitats and conditions created by the climate and geology of California. It is not uncommon to find habitats that contain isolated or disjunct populations that are geographically separated from the main population center for that species.

Plant species and habitat diversity figures importantly in the implementation of sound land management practices. The best decisions of the land manager are those which account for the vegetation of an area; that is, species identification, habitat distribution, responses to fire, and value as food for wildlife or livestock grazing. But not all land managers are botanists. This guide is therefore directed to the land manager who has some biology training but not a strong background in technical plant identification. Moreover, it is designed as a field identification manual of 132 of the most important and / or most common shrubs in the southern California chaparral area. However, this guide is not intended to replace standard taxonomy manuals such as McMinn (1939) or Munz (1974), nor is it a source document for all southern California shrubs.

Vegetative and woody parts of plants have been used in building the keys to the species. Those familiar with plant keys know that many species are distinguished by their flowering and fruiting characteristics. Often, the only consistent difference between two species is floral. Users of this guide are encouraged to treat any identification as tentative until a specimen is identified by a qualified botanist who will often use standard taxonomic references such as McMinn (1939), Munz and Keck (1959), or Munz (1974). When necessary, the collected specimen should be verified against herbarium specimens.

The plant key is most reliably applied to that area of southern California outlined on the map (*fig. 1*). The following foothills and ranges are included: the southern part of the south coastal ranges and the Santa Ynez, Santa Monica, and San Gabriel Mountains of Santa Barbara, Ventura, Los Angeles, and Orange Counties; the San Bernardino and San Jacinto Mountains of San Bernardino Riverside Counties; and the Santa Rosa, Santa Ana, Palomar, Cuyamaca, and Laguna Mountains of Riverside, San Diego, and Orange Counties.

Appendix A contains a list of plant families and genera, including woody or semi-woody plant species recognized by Munz (1974). Appendix A also includes a synopsis of features that partially characterize the environment of the species in each genus.



Figure 1—Topographic map of Southern California.

PLANTS INCLUDED IN THE GUIDE

This guide emphasizes shrub species on the coastal drainage side of the mountains (cismontane) as opposed to the desert side (transmontane). The transition between coastal drainage species and desert species is gradual.

Shrubs or subshrubs fitting the following conditions are included:

- Plants with main stems that are woody at least at the base, usually living several years or more;
- Plants with several main branches from or near the ground. If these conditions do not apply, then the plant is probably not in the guide, with the following exceptions:
 - Yucca species which commonly have short woody stems but are prominent members of the chaparral community;
 - Several species of vines that climb over and through other shrubs but have mostly woody stems;
 - A few species normally considered trees but often existing in multiple-stem shrub form.

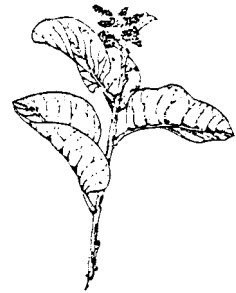
HOW TO USE THE VEGETATIVE KEYS

The vegetative keys identify shrubs based solely on vegetative characters. Thus, it is important to study the leaves and stems carefully. Choose a leaf whose size and shape looks like at least two-thirds of the leaves on the shrub. In other words, look at several leaves. Avoid young or immature leaves which often differ from mature leaves. Major leaf features are illustrated (*fig. 2*). Determine whether the leaves on your specimen are scale-like or not scale-like. Are the leaves alternate or opposite? Are the leaf veins in a pinnate or palmate pattern? Are the leaves simple or compound? If they are compound are they palmate or pinnate?

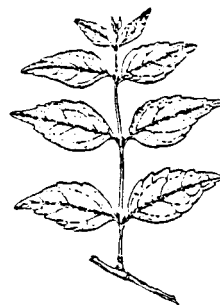
Begin with the first page of the vegetative key and find the correct group, subgroup, and leaf type; then in the section directed to compare statement a with statement b at the same level of indentation. The number sequence is only important relative to statements a and b, the comparison statements must have the same number. Also the further along in the key, the higher the number. If your specimen best fits statement b, go directly down one line under b and one indentation to the right to the next statement a, and compare this statement a and statement b with your specimen. Continue making these dichotomous comparisons until the comparison ends with the



SCALE-LIKE LEAVES



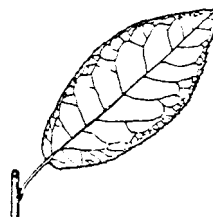
ALTERNATE LEAVES



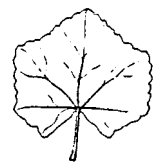
OPPOSITE LEAVES



WHORLED LEAVES



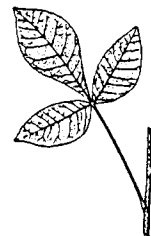
PINNATE VEINS



PALMATE VEINS



SIMPLE



PALMATE



PINNATE

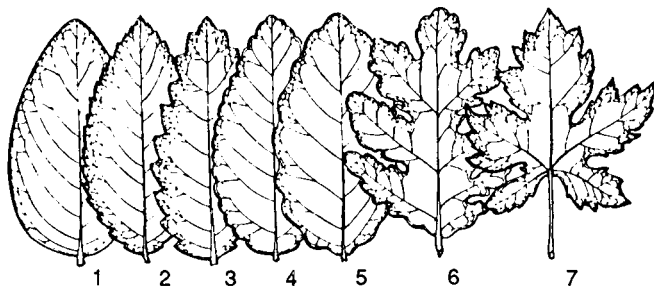
COMPOUND

Figure 2-Illustrated use of the southern California shrub key.

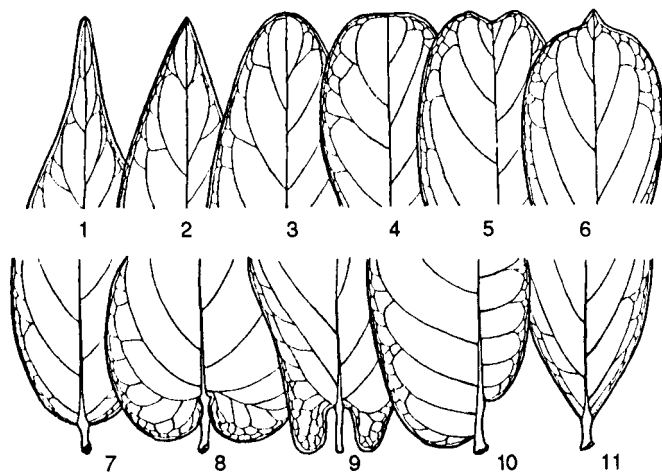
name of a shrub species or genus. Go to the page indicated and you will find either a genus or species description. If you are at the genus level, you will either go through another dichotomous key to get to the species or you will need to select the description which most closely fits your specimen. If you are directed to a species compare your specimen with the description and illustration.

A common error in judging a simple versus compound leaf is to mistake a leaflet for a leaf. Simple leaves usually have buds or growing points at their base; leaflets of compound leaves do not (fig. 2). Compound leaves usually end in a leaflet, never with a growing tip; whereas, on plants with simple leaves, the twigs end in a bud or growing point, almost never with a leaf. Always check several leaves.

Another critical decision in keying a plant involves leaf margin and leaf shape. These features are especially critical in this key. Common leaf margins and shapes of leaf tips and bases are shown in figure 3. Common leaf shapes are shown in figure 4. Compare these illustrations with glossary definitions to better understand how various definitions relate to physical features.



Margins of leaves 1. Entire 2. Serrate 3. Denate 4. Crenate 5. Sinuate. 6. Pinnately lobed. 7. Palmately lobed (From *Pacific Coast Trees*, Univ. Calif. Press.)



Tips and bases of leaves 1. Acuminate. 2. Acute. 3. Obtuse. 4. Truncate. 5. Emarginate. 6. Mucronate. 7. Rounded. 8. Cordate or heart-shaped. 9. Auriculate. 10. Oblique or unequal. 11. Cuneate or wedge shaped. (From *Pacific Coast Trees*, Univ. of Calif. Press.)

Figure 3-Leaf margin, tip, and base types.

GLOSSARY OF TERMS

Abrupt: Terminates suddenly without taper.

Acuminate: leaf tapers to a point which may be sharp (fig. 3B).

Acute: Less taper than acuminate but with a sharp point (fig. 3B).

Akene: A small fruit which does not break open when it matures but does become dry and hard.

Alternate: Generally indicates one leaf per node, can also be applied to other parts (fig. 2).

Appressed: Pressed against another part or organ.

Aromatic: Fragrant with spicy, pungent, pleasant, or ill-smelling odor.

Auricle: An appendage like an ear (lobe) especially at the base of an organ (fig. 3).

Auriculate: Having an auricle (fig. 3).

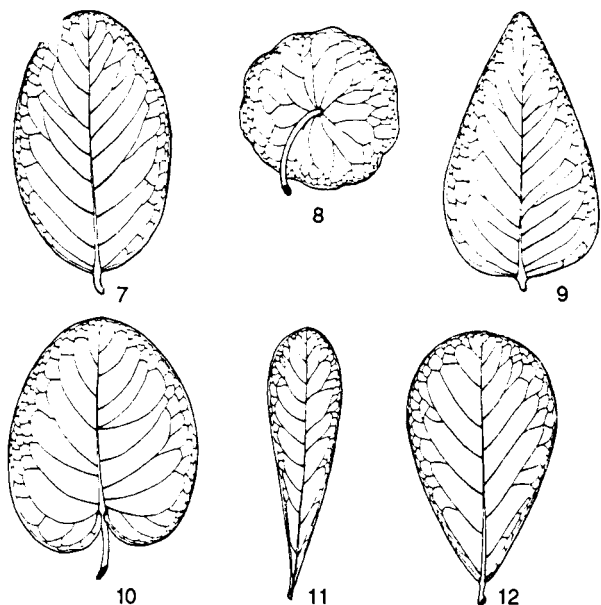
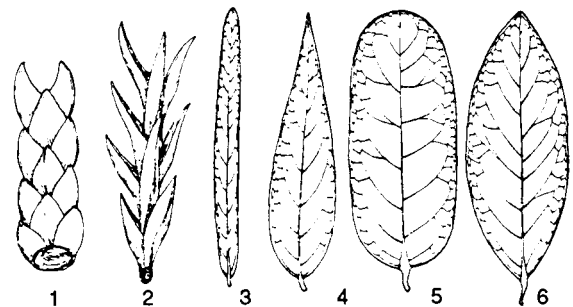
Awl-shaped: Narrow, may be nearly round and tapering to a point (fig. 4).

Bark: External covering or rind of a woody stem or root usually fibrous or cork-like and often with outer scales.

Basal: Relative to or at the base.

Bipinnate: Doubly or twice pinnate.

Bluff: Geographic feature rising steeply to a flat or rounded front; for example, at a coast line.



Shapes of leaves 1. Scale-like. 2. Awl-shaped. 3. Linear.

4. Lanceolate 5. Oblong. 6. Elliptic. 7. Oval. 8. Orbicular. 9. Ovate. 10. Cordate. 11. Oblanceolate. 12. Obovate. (From *Pacific Coast Trees* Univ. of Calif. Press.)

Figure 4-Leaf shapes.

Bract: Appendage(s) below flowers formed by a reduced leaf usually at the base of a flower pedicel.

Bractlet: A bract borne on a pedicel rather than at the base; for example, below the sepals of roses.

Branch: A shoot or secondary stem growing from a larger stem.

Branchlet: Generally the ultimate or final and smallest branch.

Broom-like: Resembling the household implement for sweeping; branches end with several slender branchlets with small leaves.

Burl: A lump at the base of the stem and at the root crown which has many buds from which sprouts may arise.

Bush: A shrub, especially one with thick, dense branching.

Canescent: Covered with whitish or grayish fine hairs.

Capsule: Fruit with two or more seeds, splits open when mature and dry.

Catkin: An open or tight cluster of small scale-like or bearded unisexual flowers in a string resembling a cat's tail; also called an "ament."

Chaparral: Shrub formation generally composed of dense shrubs (sometimes nearly impenetrable) with small, hard leaves (sclerophylls).

Coastal: Geographic location near the seashore with climate influenced by proximity to the ocean.

Compound: An organ having two or more similar parts (fig. 2).

Conifers: Cone-bearing plants; trees or shrubs with needle or scale-like leaves.

Convolute: Rolled upwards longitudinally.

Cordate: Heart-shaped, with the notch at the base and ovate in general outline (figs. 3 and 4).

Coriaceous: Cough like leather, especially in texture and feel.

Crenate: Leaf margin has rounded projections and scalloped look (fig. 3).

Crisped: Irregularly curled or wavy, ripples.

Cuneate: Wedge shaped, tapered toward the base (fig. 3).

Cupped: In the form of a cup or with edges more or less turned up to form a bowl.

Cyme: A flowering cluster which is more or less flat-topped; blooms mature from the center out, and the central axis ends with a flower.

Cymose: Bearing one or more cyme.

Deciduous: Denotes to leaves that fall or are shed at a particular season

Decumbent: Lying down on the ground with the tips turning up.

Deltoid: Delta shaped, an equal sided triangle.

Dentate: Margin is cut with sharp teeth not pointed forward.

Denticulate: Margin is finely toothed.

Dermatitis: A skin rash.

Desert: Region of low rainfall with sparse vegetation except where supplemental moisture is provided as along streams and seeps.

Diocious: Plant species that have male and female flowers on different plants.

Divergent: Extending away at a steep angle: divaricate divergence is especially wide.

Divided: Separated to base.

Drought-deciduous: Referring to woody plants that shed leaves in response to inadequate moisture supply.

Drupe: Fleshy fruit enclosing a single hard stone containing a seed, e.g. a stone fruit such as a peach.

Elliptic: Leaf shaped like an ellipse -more than twice as long as broad and widest at the center.

Emarginate: A leaf or petal with a small notch at the tip (fig. 3).

Entire: An unbroken margin, not toothed or serrated.

Epidermis: The outer layer of cells form the skin of plant parts.

Erect: Generally upright with respect to the ground but also implies an organ which is perpendicular to a stem or leaf surface.

Evergreen: Retains green leaves year-round.

Fascicle: Close cluster or bundle of flowers, leaves, stems, or roots.

Feather-veined: Veins arise from the sides of the midrib.

Forest: Dense growth of trees and shrubs covering the landscape; implies tree cover greater than woodland.

Genus: Taxonomic classification category between family and species; the first word in the Latin name of a species and is capitalized.

Glabrous: Refers only to the lack of hairy ness, bald.

Gland: An organ represented by a depression or protuberance for secreting fluids (sometimes in very small amounts).

Glandular: Bearing gland or gland-like structures.

Glaucous: More or less covered with a white or gray powder that can be rubbed off.

Globose: Spherical or roundish.

Glutinous: Waxy or gluey appearing surface formed by an exudate.

Half-shrub: Used as a synonym for subshrub; between a shrub and a herbaceous plant, having herbaceous stems that are shed with leaves or flowers.

Herbaceous: Plants or plant parts having the texture and color of leaves; plants that die to the ground after completing annual growth cycles.

Hirsute: Covered more or less densely with coarse distinctive hairs.

Hispid: Rough with stiff or bristly hairs.

Hoary: Covered with white down.

Inflorescence: Characteristic arrangement and disposition of flowers on a plant.

Interior: Inland, here meaning removed from the coast far enough to reduce influence from the ocean.

Internode: That portion of stem between two nodes.

Lanceolate: Lance-shaped leaf, much longer than broad (usually more than 3 times) tapering from below the middle to the tip (fig. 4).

Lateral: On the side or coming from the sides.

Leaf: Outgrowth from a plant stem, in several forms, but most frequently flat (figs. 2, 3, and 4).

Leaflet: Subunit or segment of a compound leaf (fig. 2).

Leathery: Resembles leather in appearance and feel, may be associated with the stiff and or thick characteristics of sclerophylls (harsh-leaved).

Linear: Leaf sides parallel like a blade of grass; linear leaves tend to be long and narrow (fig. 4).

Lobe: Division or segment of an organ, usually rounded or obtuse; cut less than halfway to the leaf midrib.

Margin: Border or edge of a structure.

Midrib: Central rib or vein of a leaf.

Midvein: Variant of midrib; the central rib of an organ such as a leaf.

Monocious: Plant species that have male and female flowers on the same plant.

Montane: Pertaining to mountains.

Mucronate: With a short sharp pointed tip at the end of a leaf (fig. 3).

Node: Joint of a stem; the point where lateral buds and leaves arise on a stem.

Ob lanceolate: Broadest part of the leaf between mid-leaf and the outer end; tapers gradually toward the petiole. usually rounded abruptly at the end, similar to spatulate (fig. 4).

Oblique: Sides of unequal length (fig. 3B).

Oblong: Leaf much longer than broad, sides nearly parallel (fig. 4).

Obovate: Reverse of ovate, with the wide end toward the leaf tip (fig. 4).

Obtuse: Blunt or rounded at the end (fig. 3).

Opposite: Set against, as with two leaves at a node (fig. 2).

Orbicular: Circular and flat (Jig. 4).

Oval: Broad, elliptic leaf with rounded ends (fig. 4).

Ovate: Leaf shaped like the outline of a hen's egg with the big end near the base (fig. 4).

Palmate: Hand-shaped with the fingers spread; in a leaf, lobes or veins radiate from a common point (figs. 2 and 3).

Peduncle: Stalk of an inflorescence; the stalk between a flower and the plant stem.

Perfect flower: Flowers with both male and female parts (stamens and pistils).

Pericarp: Ripe walls of the ovary; often in several layers, as in a peach which includes a hard endocarp next to the seed, the mesocarp or flesh of the fruit, and the epicarp or skin of the fruit.

Petiole: Leafstalk which supports the leaf blade and connects to the plant stem.

Pinnate: Having the leaflets or veins arranged on each side of a common petiole, midrib or central vein; feather-like (fig. 2).

Prickle: Sharp outgrowth of the bark or epidermis.

Prickly: Covered with prickles.

Prostrate: Lying flat upon the ground.

Prussic acid: Hydrocyanic acid is a weak acid, hence an acrid but not unpleasant peach blossom odor.

Puberulent: Minutely hairy, finely pubescent.

Pubescent: Any plant part more or less covered with short, soft hair.

Raceme: Inflorescence with flowers on stalks (pedicels) along a main axis in a dense or open, upright or drooping arrangement.

Resin: Amorphous yellow to brown to transparent covering or exudate.

Resinous: Having the characteristics of resin, as in leaves with resinous surfaces.

Revolute: Leaf rolled downward from both margins; that is, toward the underside.

Rhizome: Rootlike stem usually growing underground, mostly parallel with the soil surface and giving rise to roots from the lower side and shoots from the upper side.

Rib: (midrib) Primary vein of a leaf, or a ridge on a fruit.

Riparian: Along a stream, lake, or spring.

Rush-like: Resembling a rush; more or less straight greenish stems with few or no leaves.

Sage: Group of aromatic shrub or subshrub species belonging to the *Salvia* genus in the mint family.

Sage: scrub A subshrub formation generally found near the coast to about 1000 m (3300 ft).

Scarious: Thin and membranous in texture as a scarious bract.

Scale-like: Any thin scarious bract, usually a vestigial leaf (*figs. 2 and 4*).

Sclerophyllous: Refers to the leaves; meaning hard, indurate. The common shrubs of chaparral have hard leathery leaves.

Scurfy: Covered with small flaky scales, branlike.

Sepal: A leaf or segment of a flower's calyx.

Serrate: Sawtoothed leaf margin; teeth pointing forward (*fig. 3*).

Sessile: Stalkless. attached directly at the base; sessile leaves lack a petiole.

Shreddy: Coming off in narrow strips; shreddy bark.

Shrub: A woody plant, smaller than a tree and generally with multiple branching near the ground.

Simple: Not branched or compound (*fig. 2*).

Sinuate: Leaf with a wavy indented margin similar to crenate (*fig. 3*).

Smooth: Not rough to touch; without hairs or other rough material.

Spatulate: Spatula shaped, similar to oblanceolate; along blade rounded at both ends, but tapers toward the base from above the middle.

Species: Latin or "scientific" taxonomic name for a group of plants that have characteristics more specific than genus but less than sub species or variety; abbreviated sp. for singular and spp. for plural.

Spine: Sharp-pointed, stiff, woody body, arising from below the epidermis, usually a modified leaf.

Sprawling: Spreading irregularly along the ground or in and over other plants.

Stem: Any stalk or structure which supports a more distant part of a plant as a leaf, flower, or plant canopy.

Stipule: Appendage (usually two) at the base of a leaf petiole, a modified or undeveloped leaf often reminiscent of an ear.

Stolon: A stem usually growing along the ground surface (sometimes just below the surface) that gives rise to roots and shoots.

Strigose: Clothed with sharp appressed hairs.

Subshrub: Synonym for half-shrub; that is, between a shrub and a herbaceous plant, having herbaceous stems that are shed with leaves or flowers.

Subspecies: Taxonomic division of species; that is, more specific than species and with consistent minor differences between subspecies; abbreviated ssp.

Sufrutescent: Somewhat or obscurely woody, but not necessarily low stature.

Suffruticose: Somewhat woody with low stature.

Ternate: Arranged in groups of three, as a leaf consisting of three leaflets.

Taxon: A taxonomic unit such as variety, species, family, etc.

Taxa: Plural of taxon.

Thorn: Stiff and sharp-pointed like a spine but a thorn is a modified branch.

Tomentose: Covered with a mat (tomentum) of short dense hairs appearing wool-like.

Tomentulose: Minutely tomentose.

Tooth: Small, usually pointed lobe on a leaf margin.

Tree: Perennial woody plant generally limited to one or a few stems at the base, with a mature height greater than 3 m (10 ft) tall.

Truncate: Ending abruptly as if cut off, not tapering (*fig. 3*).

Twig: A small diameter branch; diameter of less than 0.6 cm (.25 in) is implied in this guide.

Undulate: Wavy.

Utricle: Indehiscent (does not split at maturity) fruit composed of a pouch-like, membranous pericarp enclosing the seed.

Variety: A taxonomic division of species; approximately the same meaning as subspecies; abbreviated var.

Vein: Vascular conductive bundle of a leaf or other flat organ.

Venation: Arrangement of the veins of a leaf.

Vestigial: Adjective implying evolved to a trace of a part once more perfectly developed.

Villous: Covered with shaggy hair not especially matted.

Vine: A plant whose stems depend on objects or other plants for support.

Viscid: Sticky or glutinous.

Whorl: Ring of similar organs radiating from a node as several leaves arising from a stem node.

Woodland: Land covered with trees and shrubs. Woodland implies land with tree cover less than a forest.

Woody: Stems and twigs are ligneous (wood) rather than herbaceous and do not die back to the ground after completing annual growth.

Woolly: Having long, soft hairs; usually more or less matted.

VEGETATIVE KEY TO COMMON SOUTHERN CALIFORNIA SHRUBS

Group I. Plants vine-like with woody stems that climb through and over other shrubs and trees. ----- go to 1a
 Group II. Plants not vine-like; leaves stiff, sharp-pointed, spine-tipped, often more than 30 cm long.

----- YUCCA (*Yucca* spp.), page 75

Group III. Plants not vine-like, leaves not stiff and sharp-pointed; stems mostly woody.

Subgroup I. Leaves scale-like (fig. 2), less than 6 mm long. ----- go to 7a

Subgroup II. Leaves usually more than 3 mm long, not scale-like.

Leaf type I. Leaves opposite (fig. 2); that is, paired with one on each side of the stem. ----- go to 9a

Leaf type II. Leaves simple and alternate (fig. 2), lanceolate or oblanceolate or segments nearly linear (fig. 4); leaves mostly less than 11 mm wide, up to 22 mm wide if leaves approach 15 cm long (secondary and terminal stems of *Spartium junceum* are green, vaguely rush-like; leaves tend to be drought deciduous by May or June).

----- go to 27a

Leaf type III. Leaves simple, alternate (fig. 2), mostly more than 10 mm wide; leaf may have several veins arising from near the base, and / or with leaves that are palmately lobed (fig. 3). ----- go to 49a

Leaf type IV. Leaves simple, alternate (fig. 2), mostly more than 10 mm wide, pinnately veined with one main vein from the base or with several veins arising from the base with sparse branching; mature leaves tough and/or stiff and thick and/or leathery. ----- go to 62a

Leaf type V. Leaves simple, alternate (fig. 2), mostly more than 10 mm wide, pinnately veined or with several veins with sparse branching arising from the base of long, narrow lance or linear shaped leaves (fig. 2); mature leaves more or less of thin and flexible feel. ----- go to 82a

Leaf type VI. Leaves alternate, mostly more than 10 mm wide, and compound (fig. 2); that is, leaves are divided into leaflets in a palmate or pinnate arrangement. ----- go to 99a

Leaf type VII. Leaves whorled, three at a node on the stems (fig. 2); subshrub on dry slopes in pine and oak woodlands and in manzanita chaparral. ----- WHORL-LEAF PENSTEMON (*Keckiella ternata*), page 46

Group I. Plants vine-like with woody stems that climb through and over other shrubs and trees.

1a Stems prickly; widespread shrubs in woodlands and chaparral. ----- BLACKBERRY (*Rubus* spp.), page 64

1b Stems not prickly.

2a. Leaves alternate.

3a. Leaves divided into three leaflets; widespread shrub on shaded slopes.

----- POISON-OAK (*Toxicodendron diversilobum*), page 72

3b. Leaves not divided, with five main veins from the base; occasional shrub along shaded streams.

----- WILD GRAPE (*Vitis girdiana*), page 74

2b. Leaves opposite, arranged in definite pairs along the stems.

4a. Leaves compound, usually divided into more than three leaflets; occasional shrub on shaded, mesic slopes and along streams, in many plant communities. ----- WESTERN CLEMATIS (*Clematis* spp.), page 33

4b. Leaves simple, not divided into leaflets.

5a. Leaves shiny and dark green above, thin and/ or flexible, none are united.

6a. Leaves cordate to ovate with serrate margins; widespread shrub in dry chaparral to oak woodlands. ----- STRAGGLY PENSTEMON (*Keckiella cordifolius*), page 46

6b. Leaves round to ovate not cordate, entire margins; common shrub on shaded woodland and chaparral slopes. ----- SNOWBERRY (*Symphoricarpos* spp.), page 71

5b. Leaves usually dark green, not especially shiny, but thick, leathery, and not flexible; leaves near the end of stems and below the inflorescence may be united around the stem; dry chaparral to conifer forests.

----- HONEYSUCKLE (*Lonicera* spp.), page 47

Group III. Plants not vine-like, leaves not stiff and sharp-pointed; stems mostly woody.

Subgroup I. Leaves scale-like (fig. 2) and less than 6 mm long.

7a. Leaves completely covering the branchlets and closely adhering; branches crooked; dry coastal washes and desert slopes. ----- JUNIPER (*Juniperus* spp.), page 44

- 7b. Leaves scattered along the branchlets.
- 8a. Leaves located singly on the stems; stems straight and broom-like; coastal washes and desert slopes.
----- SCALEBROOM (*Lepidospartum squamatum*), page 47
- 8b. Leaves in twos and threes appearing as brown or blackish rings at the joints of the branches; subshrub, desert slopes ----- MORMON-TEA (*Ephedra* spp.), page 36
- Subgroup II. Leaves usually more than 3 mm long and not scale-like.
- Leaf type I. Leaves opposite (*fig. 2*); that is, paired with one on each side of the stem.
- 9a. Leaves compound, pinnately divided into 3 to 9 glaucous to pubescent leaflets.
- 10a. Young stems feel round when rolled between the fingers; widespread shrub in canyons and valleys.
----- ELDERBERRY (*Sambucus* spp.), page 68
- 10b. Young stems feel square; fuzzy with fine hairs; shrub, chaparral and riparian communities.
----- FLOWERING ASH (FOOTHILL ASH) (*Fraxinus dipetala*), page 40
- 9b. Leaves simple, not compound as above.
- 11a. Leaves aromatic, with a strong smell when crushed.
- 12a. Leaves 1 to 3 mm wide, flat; stems more or less round throughout the plant; shrub, coastal sage scrub to chamise chaparral on coastal bluffs and desert slopes. ----- BUSHRUE (*Cneoridium dumosum*), page 33
- 12b. Leaves more than 3 mm wide and/ or rolled under at edges, stems usually squarish, subshrubs.
- 13a. Leaves nearly linear to narrowly lanceolate, up to 6 mm wide, becoming strongly rolled under at edges; widespread on dry coastal mountain slopes.
----- WOOLLY BLUE CURLS (*Trichostema lanatum*), page 72
- 13b. Leaves more than 6 mm wide and elliptic to lanceolate.
- 14a. Leaf veins noticeably prominent and leaves usually more than 2 cm wide; open chaparral and woodlands on dry slopes. ----- PITCHER SAGE (*Lepechinia calycina*), page 46
- 14b. Leaf veins not especially prominent and leaves mostly narrower; widespread in chamise chaparral to coastal and desert sage scrub. ----- SAGES (*Salvia* spp.), page 67
- 11 b. Leaves not aromatic, lacking a strong smell when crushed.
- 15a. Plants with warty projections on the stems at the base of the leaves; leaves often notched at the tips or cupped upwards; widespread shrubs. ----- CALIFORNIA-LILACS (*Ceanothus* spp.), page 24
- 15b. Plants without warty projections; leaves not as above.
- 16a. Leaves mostly flat, feel thin and/or flexible.
- 17a. Plant thorny with many sharp-tipped twigs in opposite branching from the main stems; leaves small and falling early; shrub, dry flats and canyons, San Diego County and south.
----- ADOLPHIA (*Adolphia californica*), page 16
- 17b. Plant not thorny, leaves not falling early.
- 18a. Leaves up to 12 cm long and 6 cm wide, large shrubs or small trees up to 6 m tall.
- 19a. Leaves lanceolate to elliptic or oblanceolate, leaf tips pointed with obvious lateral veins that curve toward the tip.
- 20a. Young twigs may be reddish with a few stiff short hairs; if not reddish, then twigs covered with short hairs; leaves glabrous or nearly so, not glandular; robust montane shrub 2 to 5 m tall, moist woodlands. ----- DOGWOOD (*Cornus* spp.), page 34
- 20b. Young stems yellowish green becoming light brown, leaves glandular and often somewhat sticky; subshrub 0.3 to 1.2 m tall, dry slopes, coastal sage scrub to chaparral. ----- MONKEYFLOWER (*Mimulus longiflorus*), page 50
- 19b. Leaves elliptic to ovate, leaf tip more or less rounded without especially obvious veins, veins do not curve toward leaf tip, twigs whitish to grayish; occasional in moist montane canyon bottoms. ----- BURNING BUSH (*Euonymus occidentalis* ssp. *parishii*), page 39
- 18b. Leaves all less than 5 cm long and up to 4 cm wide.
- 21a. Leaves grayish green to light green, round to ovate with blunted end, pubescent above and below, rarely only on the margins; shrub, woodland and shaded chaparral slopes.
----- SNOWBERRY (*Symphoricarpos* spp.), page 71
- 21b. Leaves green, lance-ovate to roundish, usually with more or less pointed end, glabrous to minutely pubescent.
- 22a. Leaves entire, linear to ovate-elliptic, up to 2 cm long, 0.7 cm wide; spreading and much-branched shrub, common on dry rocky sage scrub and chaparral slopes.
----- BUSH PENSTEMON (*Keckiella antirrhinoides*), page 45

- 22b. Leaves with coarse or fine serrated margins, ovate to roundish leaves, usually with heart-shaped base, 1.5 to 5 cm long, 1 to 3 cm wide; sprawling, vine-like shrub, dry oak woodland and chaparral slopes.
----- STRAGGLY PENSTEMON (*Keckiella cordifolius*), page 46
- 16b. Leaves rolled under along margins; feel thick, tough and leathery.
- 23a. Some leaves long and narrow, up to five times longer than broad; subshrub 0.3 to 1.2 m tall, dry coastal sage scrub to chaparral slopes. ----- MONKEYFLOWER (*Mimulus longiflorus*), page 50
- 23b. Leaves wider, usually less than five times longer than broad.
- 24a. Erect, more or less rigid shrubs.
- 25a. Young stems usually more or less white, woolly, not especially stiff; scattered shrub on dry chaparral slopes. ----- SILKTASSEL (*Garrya veatchii*), page 40
- 25b. Young stems considerably pubescent but not woolly; rigid shrub on dry barren slopes near and in desert. ----- JOJOBA (GOATNUT) (*Simmondsia chinensis*), page 70
- 24b. Plant not especially woody, often not erect throughout, either decumbent and straggly, vine-like or with more or less brittle stems, mainly woody below.
- 26a. Branches straggly or twining, often climbing through other shrubs; dry chaparral to conifer forests. ----- HONEYSUCKLE (*Lonicera* spp.), page 47
- 26b. Branches not as above, erect and rounded subshrub with harsh more or less resinous surfaces; dry chaparral and coastal sage scrub in southwestern San Diego County.
----- SAN DIEGO SUNFLOWER (*Viguiera laciniata*), page 74
- Leaf type II. Leaves are simple and alternate, lanceolate or oblanceolate or segments nearly linear (fig. 4); leaves mostly less than 11 mm wide, up to 22 mm wide if leaves approach 15 cm long (secondary and terminal stems of *Spartium junceum* are green, vaguely rush-like; leaves tend to be drought deciduous by May or June).
- 27a. Leaves usually present and definitely linear, or narrowly lance-shaped or narrow spatulate.
- 28a. Leaves deeply divided into linear lobes but not compound.
- 29a. Leaves and stems green and resinous; bark reddish gray, shredded, peeling; dry chaparral, often in well-defined plant communities. ----- RED SHANK (RIBBON BUSH) (*Adenostoma sparsifolium*), page 15
- 29b. Leaves gray green; bark not as above.
- 30a. Leaves aromatic, with a strong sage-like smell; upper leaves maybe linear and fascicled; subshrub, common on dry exposed coastal sage scrub slopes. ----- COAST SAGEBRUSH (*Artemisia californica*), page 20
- 30b. Leaves lacking a strong smell, at least some leaves divided, not fascicled; subshrub in dry washes and slopes, coastal sage scrub to scrub oak chaparral. ----- BUSH GROUNDSEL (*Senecio douglasii*), page 69
- 28b. Leaves not divided into linear lobes.
- 31a. Branches rather straight and broom-like.
- 32a. Stems and leaves whitish green; subshrub, dry open montane conifer slopes.
----- RUBBER RABBITBRUSH (*Chrysothamnus nauseosus*), page 32
- 32b. Stems and leaves green, resinous; maybe nearly leafless except near end of stems; shrub, sandy washes, San Diego County and south. ----- BROOM BACCHARIS (*Baccharis sarothroides*), page 23
- 31b. Branches not as above.
- 33a. Branches thorny, more or less sharp-tipped; leaves may be in fascicles, almost linear to spatulate (oblanceolate).
- 34a. Leaves single or in groups of three; numerous spine-tipped short branchlets; intricately-branched shrub; coastal shrub, mostly below 110 m elevation.
----- BOXTHORN (*Lycium californicum*), page 49
- 34b. Leaves generally in fascicles (bundles) with short and long leaves together; branches somewhat spine tipped; shrub, desert slopes. ----- DESERT ALMOND (*Prunus fasciculata*), page 52
- 33b. Branches not thorny or sharp-tipped; short, needle-like leaves in fascicles, 4 to 10 mm long; most common chaparral shrub. ----- CHAMISE (GREASEWOOD) (*Adenostoma fasciculatum*), page 15
- 27b. Leaves wider than above, up to 10 mm wide (up to 22 mm if leaves approach 15 cm long); leaves sometimes nearly missing but then leaving small green twigs.
- 35a. Leaves usually present and strongly aromatic.
- 36a. Leaves whitish, not resin dotted.
- 37a. Leaves with three or more short teeth at tips, widest point may exceed 10 mm; shrub, desert interface scrub communities, dry conifer woodlands. ----- BASIN (BIG) SAGEBRUSH (*Artemisia tridentata*), page 20

- 37b. Leaves usually deeply divided into linear (1 mm wide) segment; common subshrub, dry coastal sage scrub, chaparral washes and slopes. ----- COAST SAGEBRUSH (*Artemisia californica*), page 20
- 36b. Leaves green, more or less resin-dotted, sticky, lemon or pine smell; some or most leaves less than 2 mm wide; shrub, dry coastal sage scrub; chaparral washes and slopes.
-----GOLDENBUSH (*Haplopappus pinifolius*), page 42
- 35b. Leaves, if present, not strongly aromatic.
- 38a. Leaves usually present, most lance shaped; mature leaves usually more than 4 cm long.
- 39a. Leaves dark green on both surfaces, somewhat sticky, often appearing three-veined with the lowest laterals continuing to near leaf tip; common willow-like evergreen shrub, streamsides and other wet places.
----- MULEFAT (*Baccharis glutinosa*), page 22
- 39b. Leaves somewhat tomentose to silky, white hairs, midvein with several laterals throughout its length; common deciduous shrub, wet places. -----SANDBAR WILLOW (*Salix hindsiana*), page 66
- 38b. Leaves, if present, mostly less than 6 cm long; not lance-shaped.
- 40a. Leaves usually present; at least some in fascicles.
- 41a. Leaves more or less revolute or at least rolled under at the edge.
- 42a. Leaves tend to be wedge-shaped or rounded to heart-shaped with point at end.
- 43a. Leaves generally have three broad, blunt teeth at end; glabrous or nearly so, more or less glandular; shrub, desert and chaparral-desert interface.
----- BITTERBRUSH (*Purshia glandulosa*), page 54
- 43b. Leaves round or heart-shaped; subshrub, coastal bluffs.
----- SEACLIFF BUCKWHEAT (*Eriogonum parvifolium*), page 39
- 42b. Leaves longer, not wedge-shaped, tapering to a point, pubescent, not glandular; low, spreading shrub, dry slopes. ----- CALIFORNIA BUCKWHEAT (*Eriogonum fasciculatum*), page 38
- 41b. Leaves normally flat or at least not rolled under at the edges.
- 44a. Leaves tend to be more or less round or oval on a petiole at least 2 mm long; evergreen shrub, dry coastal sage scrub slopes.-----REDBERRY (*Rhamnus crocea*), page 59
- 44b. Leaves more or less long and narrow, normally sessile.
- 45a. Leaves and at least some twigs are pubescent to densely tomentose; leaves not resinous and sticky.
- 46a. Leaves almost all less than 3 mm wide, rigid and spine-tipped with age; branchlets and leaves light gray to white with tomentum, darkening with scale patches during aging; shrub, dry slopes. -----HAIRY HORSEBRUSH (*Tetradymia comosa*), page 71
- 46b. Leaves 2 to 8 mm wide, becoming neither spine-tipped or very rigid with age; branchlets covered with white or rusty star shaped hairs, mixed with straight hairs, becoming grayish with age but without scale spots; small shrub, dry montane flats and desert. -----WINTER FAT (*Eurotia lanata*), page 39
- 45b. Leaves and twigs glabrous or nearly so, resinous and sticky; erect shrubs, dry exposed south slopes and washes.-----GOLDENBUSH (*Haplopappus parishii*), page 41
- 40b. Leaves, if present, are not in fascicles.
- 47a. Leaves, if present, are green and glabrous.
- 48a. Leaves present, often appear to be three-veined; leaves and young stems more or less glandular; shrub may have broom-like appearance; shrubs and subshrubs, many environments.
-----BACCHARIS (*Baccharis* spp.), page 22
- 48b. Leaves, if present, nearly flat, green and neither glandular or pubescent; both secondary and terminal branches are green becoming gray at base; plant, more or less delicate with vague rush-like appearance, naturalized exotic shrub, roadsides.
-----SPANISH BROOM (*Spartium junceum*), page 70
- 47b. Leaves mostly grayish and scurfy, not glandular, definite single midvein; shrub, dry hills and washes, desert and chaparral-desert interface.
----- SALT BUSH (*Atriplex canescens*), page 21
- Leaf type III Leaves simple, (*fig. 2*) alternate, mostly more than 10 mm wide, several veins arising near the base and/or with leaves palmately lobed (*fig. 3*).
- 49a. Leaves with three or more veins coming from the base, not palmately lobed.
- 50a. Several veins arising from the base of the leaf.
- 51a. Leaves rounded, mostly with six, seven, or more main veins from base; shrub or small tree; Palomar, Laguna, and Cugamaca Mountains. ----- REDBUD (*Cercis occidentalis*), page 30

- 51 b. Leaves usually longer than broad, with three veins arising from the base; common shrub, many communities.
-----CALIFORNIA-LILACS (*Ceanothus* spp.), page 24
- 50b. Leaves with three to five veins arising from near the base of single central vein.
- 52a. Leaves triangular to lance-shaped; leaves and stems harsh and roughly hairy; subshrub, dry chaparral and coastal sage scrub, southwestern San Diego County.-----SAN DIEGO SUNFLOWER (*Viguiera laciniata*), page 74
- 52b. Leaves and stems not as above.
- 53a. Leaves notched or somewhat heart-shaped at base.
- 54a. Leaves 1.2 to 4 cm long; plant aromatic with many thin stems from a woody base; subshrub, dry coastal sage scrub to chamise chaparral washes and slopes.
-----BRICKELLBUSH (*Brickellia californica*), page 24
- 54b. Leaves 3 to 15 cm long; plant not aromatic, sparingly branched; subshrub, shaded canyon sides, coastal sage scrub to scrub oak chaparral.
-----CANYON-SUNFLOWER (*Venegasia carpesioides*), page 74
- 53b. Leaves not as above, rounded or tapering at base.
- 55a. Leaves yellowish green and pubescent; bark light brown; subshrub, coastal bluffs, coastal sage scrub to dry chaparral.-----CALIFORNIA ENCELIA (*Encelia californica*), page 35
- 55b. Leaves covered with dense hairiness; leaf feels of felt; subshrub, interior species, dry chaparral to deserts. -----BRITTLEBUSH (INCIENSO) (*Encelia farinosa*), page 35
- 49b. Leaves with single vein at the base, may branch later, at least obscurely palmately lobed to deltoid to nearly round, but with three or more rounded or pointed lobes in outline.
- 56a. Stems with spines where the leaves are attached; widely distributed shrub.
-----GOOSEBERRIES (*Ribes* spp.), page 59
- 56b. Stems lacking spines.
- 57a. Leaves with three to five pinnate lobes, pinnate venation, olive colored; stems exude clear bitter juice; subshrub, dry coastal sage scrub and chaparral washes and canyons.
-----MATILJA POPPY (*Romneya* spp.), page 63.
- 57b. Leaves may be variously lobed but not generally in pinnate form, green; stems lack bitter juice.
- 58a. Leaves dark green above, rusty, fuzzy below, on branchlets; usually with well-developed thick trunk at base large shrub or small tree, chaparral to conifer slopes.
-----FLANNEL BUSH (*Fremontodendron californicum*), page 40
- 58b. Leaves and stems not as above; basal branches usually less than 2 cm thick; not trunk-like, but may be up to 5 cm in *Malacothamnus*.
- 59a. Leaves grayish green, densely fuzzy on both surfaces; shrub, dry coastal sage scrub canyon sides.
-----BUSH MALLOW (*Malacothamnus fasciculatus*), page 50
- 59b. Leaves not as above; lacking fuzz; if fuzzy, then green above and paler below.
- 60a. Leaves less than 10 cm wide, lobes rounded in outline; widely distributed shrub.
-----CURRANTS (*Ribes* spp.), page 59
- 60b. Leaves more than 10 cm wide with three or more lobes.
- 61a. Leaves 10 to 16 cm wide, 3 to 5 blunt lobes; stems not armed; bark grayish, peeling; young branchlets may be pubescent; shrub, open woods, shaded canyons.
-----THIMBLEBERRY (*Rubus parviflorus*), page 65
- 61b. Leaves large, 10 cm up to 40 cm, more than five lobes; stems glabrous, often red and herbaceous; exotic subshrub, washes and waste places.
-----CASTOR-BEAN (*Ricinus communis*), page 62
- Leaf type IV. Leaves simple, alternate (fig. 2), mostly more than 10 mm wide, pinnately veined with one main vein from the base or with several veins arising from the base with sparse branching; mature leaves tough and/or stiff and thick and/or leathery.
- 62a. Leaves stiff, mostly spiny or at least with sharply serrated margins.
- 63a. Leaves clasping the stems at base, lacking petiole; low subshrub, open hills, coastal sage scrub to chamise chaparral. S
-----SAWTOOTH GOLDENBUSH (*Haplopappus squarrosus*), page 42
- 63b. Leaves petioled, at least not clasping stems.
- 64a. Mature leaves of various lengths up to 13 cm long.
- 65a. Leaves green, lighter below and usually hairless but sometimes pubescent; leaves usually flat, sometimes convex, bark becoming gray but not shreddy; large shrub or tree, shaded chaparral to oak woodland slopes.
-----TOYON (CHRISTMASBERRY) (*Heteromeles arbutifolia*), page 42

- 65b. Leaves green, white fuzz below and hairless above; leaves usually strongly revolute, sometimes flat; bark becoming gray and shreddy; shrub, dry chaparral slopes below 550 m near coast.
----- SUMMER-HOLLY (*Comarostaphylis diversifolia*), page 34
- 64b. Leaves mostly less than 6 cm long.
66a. Mature leaves commonly dark green above, with or without pubescence, shiny but not glossy; major veins may be yellowish green; on same plant, some leaves with spiny margins, some margins smooth; shrub oaks, widespread on dry slopes and canyons ----- SHRUB OAKS (*Quercus* spp.), page 54
66b. Leaves not as above in all ways; leaves tend to be glossy, glabrous at least above, always with more or less spiny margins.
67a. Leaves rounded or notched at tips, normally flat; scraped bark not noticeably aromatic; shrub, chaparral and pine forests. ----- HOLLYLEAF REDBERRY (*Rhamnus ilicifolia*), page 56
67b. Leaves usually tapering to a point, sometimes abruptly, rarely rounded outline; leaf normally wavy (crisped); scraped bark aromatic with prussic acid odor; shrub or small tree, chaparral to oak woodlands. ----- HOLLYLEAF CHERRY (*Prunus ilicifolia*), page 53
- 62b. Leaves not as above, margins lacking serration or serration not spiny, may be dentate (toothed); some leaves on a particular plant may have rather sharp serrations (e.g. *Rhus integrifolia*).
68a. Mature trunks and branches with smooth red epidermis or somewhat furrowed, dark red brown to gray brown bark, bark often shredding; leaf margins lack serrations.
69a. Mature leaves flat, base usually tapering abruptly to petiole, tip tapering gradually or abruptly to a point; widespread shrub. ----- MANZANITA (*Arctostaphylos* spp.), page 17
69b. Mature leaves almost always somewhat cupped downward to nearly revolute, tapering gradually at both ends; shrub, chamise chaparral in western San Diego County and Baja California.
----- MISSION-MANZANITA (*Xylococcus bicolor*), page 75
- 68b. Trunks and branches not as above; most leaves entire, some leaves serrate or dentate.
70a. Leaves folded or curled upwards along midvein; rarely, leaves serrated.
71a. Leaves green or green with reddish tint, thick and usually folded upward forming a narrow, shallow U or almost a V from the midvein; species found below 1800 m.
72a. Twigs usually dark red; leaves sometimes with dark reddish tint, may be thin and flexible, somewhat aromatic when crushed; shrub, coastal sage scrub hills and washes below 600 m elevation.
----- LAUREL SUMAC (*Rhus laurina*), page 57
72b. Twigs tinted light reddish leaves mostly without reddish veins or margins, thick and leathery, not aromatic when crushed; shrub, dry chaparral between 300 and 1700 m.
----- SUGAR BUSH (*Rhus ovata*), page 58
- 71b. Leaves yellowish green, rust colored fuzz below; leaves thick, almost flat to slightly cupped upwards; shrub mostly high montane shrub above 1600 m in thickets on rocky ridges, conifer woodlands.
----- CHINQUAPIN (*Chrysolepis sempervirens*), page 32
- 70b. Leaves usually flat; sometimes cupped upward; rolled under, or crumpled; almost never folded upwards from the midvein as above; leaves may be dentate; some leaves entire, some serrated on same plant.
73a. Leaves nearly same color on both surfaces, usually flat, at least not cupped upward.
74a. Leaves dark green to yellowish green, not fuzzy or pubescent, may be dentate.
75a. Leaves entire, lance-shaped to oblong or elliptical, dull yellowish green; shrub, dry chaparral slopes.
----- BUSH POPPY (TREE POPPY) (*Dendromecon rigida*), page 35
75b. Leaves dentate, dark green, not lance shaped; shrub, coastal hills, inland to 900 m elevation.
----- CHAPARRAL BROOM (*Baccharis pilularis* ssp. *consanguinea*), page 22
- 74b. Leaves densely grayish, fuzzy on both surfaces; leaf margins crenate to coarsely dentate; mostly woody subshrub, dry gravelly and rocky places in chaparral to dry conifer and oak woodlands.
----- THICKLEAF YERBA SANTA (*Eriodictyon crassifolium*), page 37
- 73b. Leaves more or less bicolored, green or dark green above, paler below.
76a. Leaves mostly more than 3 cm long.
77a. Leaves flat to cupped upward in a U shape and smooth on both surfaces, though veins below sometimes prominent; most leaves entire, sometimes both entire and serrate on the same plant.
78a. Leaves commonly elliptic, margins irregularly toothed, somewhat aromatic when crushed, prominent midvein; shrub, ocean bluffs below 600 m.
----- LEMONADEBERRY (*Rhus integrifolia*), page 57
78b. Leaves lance-shaped or oblong, margins entire, aromatic with strong odor of Bayleaf when crushed, midvein not especially prominent; tree or robust shrub, shaded slopes.
----- CALIFORNIA BAY (LAUREL) (*Umbellularia californica*), page 73

- 77b. Leaves not as above, midveins may be prominent, especially below.
- 79a. Mature leaves sticky or resinous, crumpled and uneven surface with prominent midvein; shrub, dry chaparral and conifer woodlands to the high desert.
-----YERBA SANTA (*Eriodictyon trichocalyx*), page 38
- 79b. Leaves not sticky or resinous, veins curving to somewhat parallel with margin, prominent feather-veining below; shrub, shaded hills and riparian areas, chaparral, oak and conifer forests. ----- COFFEEBERRY (*Rhamnus californica*), page 55
- 76b. Leaves mostly less than 3 cm long, shade leaves sometimes longer (to 7 cm).
- 80a. Leaves serrate at tips, smooth, more or less wedge-shaped at base; large gray barked shrub, dry chaparral and oak woodland slopes.
-----WESTERN MOUNTAIN-MAHOGANY (*Cercocarpus betuloides*), page 31
- 80b. Leaves, serrations (if present) usually involve most of leaf margins.
- 81a. Leaves similar in color on both surfaces; base of leaf has stipules (wart-like projections), usually prominent; leaves may be strongly revolute; widespread shrub.
-----CALIFORNIA-LILACS (*Ceanothus* spp.), page 24
- 81b. Leaves grayish green or whitish below, margins not serrated, stipules not prominent, leaves almost always strongly revolute; shrub or small tree, dry and rocky sage brush and conifer slopes above 1200 m.
-----CURLLEAF MOUNTAIN-MAHOGANY (*Cercocarpus ledifolius*), page 31
- Leaf type V. Leaves simple, alternate (*fig. 2*), mostly more than 10 mm wide, pinnately veined or with several veins with sparse branching arising from the base of long, narrow lance or linear-shaped leaves (*fig. 2*); mature leaves have more or less thin and flexible feel.
- 82a. Leaves whitish, pale green on both surfaces.
- 83a. Leaves glaucous (covered with white film), often more than 5 cm long; common shrub or small tree, naturalized exotic, waste places and along roads. ----- TREE TOBACCO (*Nicotiana glauca*), page 51
- 83b. Leaves scurfy, less than 5 cm long; shrub, near the coast, saline desert places, coastal sage scrub, and saltbrush communities. ----- LENSACLE SALTBUSH (*Atriplex lentiformis*), page 22
- 82b. Leaves not pale on both surfaces; green or dark green on upper or both surfaces, sometimes paler to yellowish or brownish below.
- 84a. Leaves green, densely fuzzy on both surfaces, may be sticky, cause dermatitis in some people; subshrub, occasionally on dry disturbed places in chaparral and pine woodlands.
----- POODLE-DOG BUSH (*Turricula parryi*), page 72
- 84b. Leaves not as above.
- 85a. Leaves round in outline, without serration, with rusty fuzz below and on new growth; shrub, chaparral and oak woodland slopes. ----- STORAX (*Stirax officinalis*), page 71
- 85b. Leaves lanceolate to ovate or elliptical to approximately linear, sometimes margins serrate or dentate, normally rusty fuzz below is absent.
- 86a. Leaves commonly approximately lance-shaped or oval to linear, few to several shallow dentations, same color on both surfaces.
- 87a. Leaves usually much longer than broad, lanceolate or oblanceolate to almost linear, usually serrated or with shallow dentations, may be glutinous or hairy; small stems not spine-tipped.
- 88a. Evergreen leaves, often with few to several shallow dentations above lower third of leaf; commonly, leaves and young stems glabrous, more or less glutinous, color about equal above and below; shrubs and subshrub, widely distributed. ----- BACCHARIS (*Baccharis* spp.), page 22
- 88b. Deciduous leaves, entire or with small serrations (edges may be rolled downward), usually somewhat darker above, leaves usually pubescent to hairy, not glutinous; shrub or small tree, common in wet places. ----- WILLOW (*Salix* spp.), page 65
- 87b. Leaves mostly glabrous, usually somewhat longer than broad, lance shaped to ovate, mostly entire, sometimes with notch at tip; leaves and stems not glutinous; small stems spine-tipped; large shrub, coastal sage scrub and chaparral slopes below 900 m elevation.
----- GREENBARK CEANOTHUS (*Ceanothus spinosus*), page 29
- 86b. Leaves elliptic or ovate to lance-shaped, lower surface paler to somewhat more yellowish green than upper surface.
- 89a. Leaves prominently feather-veined below, midvein and lateral veins easily felt.
- 90a. Leaf margins generally dentate or with coarse serrations on outer half of leaf.
- 91a. Leaf margins dentate, surfaces generally pubescent to villous; shrub, moist wooded

- slopes.----- CREAMBUSH (*Holodiscus discolor*), page 43
- 91b. Leaf margins with relatively coarse serrations on outer half of leaf; leaves commonly glabrous above and pubescent below or pubescent on both sides; shrub or small tree, dry chaparral to oak woodlands.
----- WESTERN MOUNTAIN-MAHOGANY (*Cercocarpus betuloides*), page 31
- 90b. Leaf margins entire; serrations, if present, on entire leaf margin.
- 92a. Bark of young branchlets reddish; shrub, chaparral to conifer hillsides and ravines between 1200 and 2100 m. -----COFFEEBERRY (*Rhamnus californica*), page 55
- 92b. Bark of most branchlets whitish or yellowish to green or olive; widespread shrub.
----- CALIFORNIA-LILACS (*Ceanothus* spp.), page 24
- 89b. Leaves smooth on lower surface; except for midvein, lacking prominent easily felt veins.
- 93a. Leaves commonly roundish at least in outline to ovate or elliptical but may also approach lanceolate to oblong.
- 94a. Leaves with serrations or dentations, if present, confined to tips; flat, up to 4 cm long, 3 cm wide; shrub, dry conifer slopes.
-----SERVICE BERRY (*Amelanchier utahensis*), page 16
- 94b. Leaves mostly with entire margins, folded upward from the midvein, usually greater than 5 cm long and 2-to 5-cm wide; shrub, dry chaparral and coastal sage slopes below 600 m.
----- LAUREL SUMAC (*Rhus laurina*), page 57
- 93b. Leaves lance-shaped, often tapering at both ends, usually more than 4 cm long.
- 95a. Leaves deciduous, light green and glabrous above and below.
- 96a. Young twigs pubescent to densely tomentose, becoming gray and furrowed, limited to wet places like stream banks; shrub or small tree, common in wet places.
----- WILLOW (*Salix* spp.), page 65
- 96b. Young twigs not pubescent or tomentose, reddish to brown becoming dark brown or gray with smooth bark to gray and shreddy; not limited to wet places, but some species in moist woods.
- 97a. Young twigs brown, becoming gray with shreddy bark; leaves, obvious yellowish red midvein; shrub, moist woods or near streams.
-----WESTERN AZALEA (*Rhododendron occidentale*), page 56
- 97b. Young twigs red brown to brown, becoming brown or gray with smooth bark; leaves without obvious midvein (likely to have taste of bitter almond); wide spread, along moist stream to desert slopes.
----- STONE FRUITS (*Prunes* spp.), page 51
- 95b. Leaves evergreen, glossy to dark green above, paler to almost equal below, pubescent to hairy on leaf margins and / or veins, sometimes glaucous.
- 98a. Leaves entire, strong odor of bay when crushed; tree or robust shrub, shaded canyons and slopes, many communities.
----- CALIFORNIA BAY (*Umbellularia californica*), page 7
- 98b. Leaves entire to slightly serrate, without strong odor of bay when crushed; large shrub, moist places in coastal sage scrub, chaparral, woodlands below 50 m.
----- WAX- MYRTLE (*Myrica californica*), page 50
- Leaf type VI. Leaves alternate, mostly more than 10 mm wide, compound (fig. 2); that is, leaves divided into leaflets in a palmate or pinnate arrangement.
- 99a. Leaves with three or more leaflets; in a palmate pattern if four or more leaflets.
- 100a. Leaves with more than four leaflets in a palmate pattern, originating from same point and leaflets of same form; rounded subshrub, common after fire and occasional later below 1600 m, many plant communities.
----- LUPINE (*Lupinus* spp.), page 49
- 100b. Leaves normally with three leaflets (sometimes with four or five) in various patterns with variously serrated margins.
- 101a. Leaflets with variously serrated margins.
- 102a. Stems with prickles; widespread shrub in woodlands and chaparral.
----- BLACKBERRY (RASPBERRY) (*Rubus* spp.), page 64

- 102b. Stems without prickles.
 - 103a. Leaflets joined at base; occasional sprawling shrub found in patches.
-----SQUAW BUSH (BASKET SUMAC) (*Rhus trilobata*), page 58
 - 103b. Leaflets separate at base; common sprawling shrub often in dense thickets, shaded chaparral and oak hillsides; causes dermatitis in most people.
-----POISON-OAK (*Toxicodendron diversiloba*), page 72
- 101b. Leaflets with entire margins.
 - 104a. Branchlets ending in stiff thorn; infrequent shrub, dry manzanita chaparral to live oak woodland slopes.
-----CHAPARRAL-PEA (*Pickeringia montana*), page 51
 - 104b. Branchlets not ending in a stiff thorn.
 - 105a. Leaves strongly ill-scented; shrub, coastal bluffs and deserts, coastal sage scrub to creosote bush communities. ----- BLADDERPOD (*Isomeris arborea*), page 43
 - 105b. Leaves lacking strong smell.
 - 106a. Low subshrub, most upper stems green and rounded with strong tendency to be drought deciduous; dry coastal sage scrub and chaparral slopes. ----- DEERWEED (*Lotus scoparius*), page 48
 - 106b. Erect shrub with green, angled branchlets; more or less drought deciduous leaves, pubescent at least below; exotic shrub, along highways and near the coast in waste places.
-----FRENCH BROOM (*Cytisus monspessulanus*), page 34
- 99b. Leaves with five or more leaflets in a pinnate pattern, rarely three and then with sharp-toothed margins.
 - 107a. Leaflets holly-like, with sharp-toothed margins; shrub, shaded chaparral and dry oak to conifer slopes.
----- BARBERRY (*Berberis* spp.), page 24
 - 107b. Leaflets not holly-like, without sharp-toothed margins.
 - 108a. Leaves or stems with thorns or prickles.
 - 109a. Leaflets 11 to 27; shrub, chaparral to dry conifer slopes.
----- FALSE-INDIGO (*Amorpha californica*), page 17
 - 109b. Leaflets 5 to 9; sprawling shrubs, common in moist to shaded woodlands
 - 108b. Leaves and stems lacking thorns and prickles.
 - 110a. Leaflets 11 to 27, ranging from 3.5 to 7.5 cm long, edges serrated; tree or large shrub, locally common in oak woodlands. ----- WALNUT (*Juglans californica*), page 44
 - 110b. Leaflets finely subdivided at least once into oval segments or lobes; leaves ranging from 3.5 to 8 cm long; small ill-smelling shrub, San Diego County in chaparral and coastal sage scrub.
----- SAN DIEGO MOUNTAIN MISERY (*Chamaebatia australis*), page 31

SPECIES DESCRIPTIONS

The common names for the plants described herein are those in general usage. The latin names are consistent with Munz (1974). Plant descriptions are arranged in alphabetic order by genus. The brief descriptions emphasize vegetative features (rather than flower and fruiting characters) which are based on field observations: specimens filed at the Forest Fire laboratory, USDA Forest Service, Riverside; Botanic Garden, Rancho Santa Ana; Botanic Garden, Santa Barbara; and the Herbarium, University of California, Riverside. Several manuals are available to help identify shrubs; *A Flora of Southern California* by Munz (1974) is the primary resource manual; Raven (1966) authored *Native Shrubs of Southern California*; and McMinn's (1939) text *An Illustrated Manual of California Shrubs*, remains a major reference work. Other references include Abrams (1960), Collins (1974a,b), and Munz and Keck (1970). Smith (1976) authored a text on the flora of the Santa Barbara area.

Wildlife values follow Martinet al. (1951), Van Dersal (1938), or USDA Forest Service (1969), and are defined for utilization of browse or fruits as preferred, staple, or low value. Cultural values are largely based upon information contained in literature discussing uses by Native Americans, especially the Cahuilla Indians of southern California (Balls 1972, Clarke 1977, Medsger 1966, Sweet 1962).

The unit titled *Fire Response Mechanism* provides information about the sprouting characteristics for each species, if known. Collectively, chaparral shrubs are well adapted to fire and have developed diverse methods of regeneration. Many species readily stump-sprout from trunks, main branches, enlarged basal burls, roots, or rhizomes. Species that do not sprout as so defined but are dependent solely upon seeds for regeneration are termed *obligate seeders*. Some dominant shrubs combine sprouting strategies; for example, chamise sprouts vigorously from basal burls and has a seedling response to fire as well.

Adenostoma fasciculatum H. & A. Rose Family (*Rosaceae*)
CHAMISE (GREASEWOOD) (fig. 5). Diffusely branched, evergreen shrub, 0.5 to 3.5 m tall, reddish bark becoming shreddy with age; leaves green, mostly 4 to 14 leaf, alternate bundles crowded on stems, rarely single, linear, 4 to 10 (> 20) mm long, sharp-pointed, usually channeled on one side; seedling leaves divided one, two, or three times into two to several linear lobes; flowers, February through June, small, white, compact clusters 4 to 12 cm long; fruit, akene enclosed by hardened floral tube.

Distribution: Common dominant on dry slopes below 1500 m (5000 ft); chaparral merging into coastal sage scrub (soft chaparral) and desert chaparral; Channel Islands, coast ranges, Mendocino County to Baja California, Sierra Nevada foothills. Var. *obtusifolium* Wats., broader leaves, almost obtuse; shorter (3-7 mm long, 1+ mm wide); San Diego County.

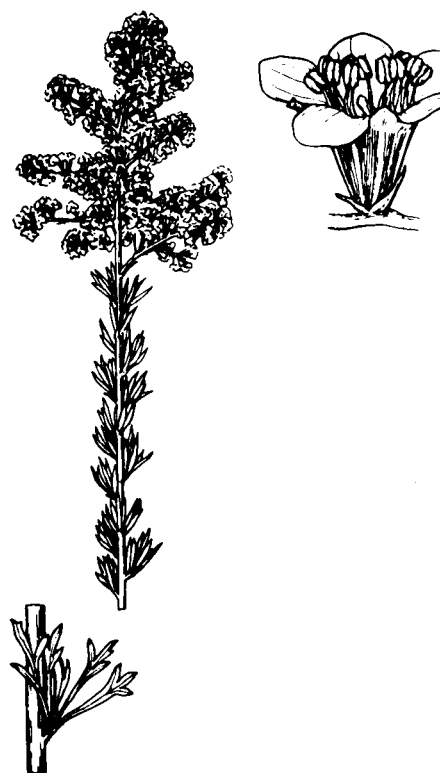


Figure 5—Chamise (greasewood), *Adenostoma fasciculatum* (McMinn 1939).

Fire Response Mechanism: Stump-sprouts from basal burls and lateral shoots after fire; many seeds germinate after some fires, only few survive.

Wildlife Value: Readily browsed few years after fire; cover for deer.

Cultural Value: Native Americans used infusion of bark and leaves as cure for syphilis, and oil of plant to cure skin infections (Sweet 1962); scale insect on plant used to bind arrows, baskets, etc.

A. sparsifolium Torr.

RED SHANK (RIBBON BUSH) (fig. 6). Evergreen shrub or small tree, 2 to 6 m tall, red brown bark; peels in thin sheets and strips; twigs yellowish green, resinous, sticky; leaves linear, alternate, 4 to 10 (< 15) mm long, leaves not in bundles, often crowded on young twigs; shoots arise from leaf axil buds with leaf persisting; flowers, July and August, white or pinkish, fragrant, loose clusters 2 to 6 cm long; fruit, akene enclosed by hardened floral tube.

Distribution: Discrete, disjunct populations, dry slopes, mesas below 1800 m (6000 ft); chaparral, often dominant in Baja California, Mexico; red shank-dominated communities common in southern Riverside and northern San Diego Counties; small enclave on Los Angeles-Ventura County border; disjunct communities in northern Santa Barbara County into San Luis Obispo County (Hanes 1965).

Fire Response Mechanism: Stump-sprouts from basal burls; seed response to fire.



Figure 6-Red shank (ribbon bush), *Adenostoma sparsifolium* (McMinn 1939).

Wildlife Value: Low value; cover for deer.

Cultural Value: Leaves, same as *A. fasciculatum*; ground into powder, mixed with grease for salve.

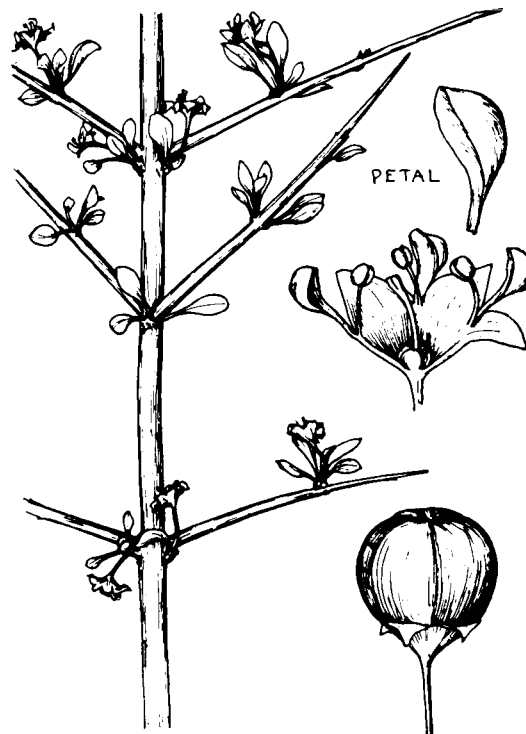


Figure 7-Adolphia, *Adolphia californica*.

Adolphia californica Wats. Buckthorn Family (*Rhamnaceae*)
ADOLPHIA (fig. 7). Shrub, thorny, stiff, many-branched, drought deciduous; to 1 m tall; branches green; leaves round to oval, opposite, 2 to 5 mm long; 2 to 3 mm wide, fall early, pale green, about 5 mm long or more; flowers, December through April, inconspicuous, greenish white, five petals; fruit, 3-lobed capsule 4 to 5 mm wide.

Distribution: Dry flats and canyons; southwest San Diego County to Baja California.

Fire Response Mechanism: Obligate seeder.

Wildlife Value: Low value.

Cultural Value: Unknown.

Amelanchier utahensis Koehne. Rose Family (*Rosaceae*)
SERVICE-BERRY (fig. 8). Deciduous shrub, much-branched, 1 to 5 m tall; youngest twigs reddish, mature with ash-gray bark, rigid twigs, white pubescence on young growth; mature leaves gray green, color nearly equal above and to somewhat lighter below, alternate, roundish to oval or elliptic, usually flat, 1 to 4 cm long, 0.5 to 3 cm wide, usually tomentose to some degree to near base on both sides, toothed or serrate especially on outer two-thirds of leaf margin, sometimes serrations restricted to end of leaf, rarely entire; leaves on petioles 5 to 15 mm long, rather delicate midvein most



Figure 8-Service-berry, *Amelanchier utahensis*.

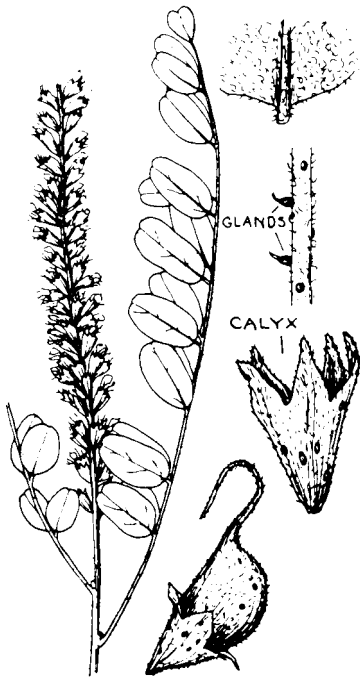


Figure 9-False indigo, *Amorpha californica* (McMinn 1939).

prominent near base, 11 to 13 pairs of lateral veins, tend to thin and flex; flowers, April through May, white, 3- to 6-flower clusters, five petals, deciduous; fruit 6 to 10 mm diameter, purplish black, juicy to dry.

Distribution: Dry slopes 900 to 2100 m (3000-7000 ft); ponderosa pine, Jeffrey pine, pinyon juniper, western juniper; San Bernardino, San Gabriel Mountains, south to San Diego County, north to Montana and Oregon.

Fire Response Mechanism: Stump-sprouter after fire.

Wildlife Value: Staple browse for deer, livestock; fruits preferred by birds and many mammals.

Cultural Value: Native American, berries eaten fresh or dried; pounded, stored for later use as 4.5 to 7 kg (10-15) loaves; green inner bark, boiled for eyewash (Clarke 1977).

Amorpha californica Nutt. Pea Family (*Fabaceae*)
FALSE-INDIGO (fig. 9). Slender, deciduous shrub, 1.5 to 3 m tall, somewhat hairy twigs; young stems green, soon become brownish then dark gray; prickly-like glands on branchlets and leaf midveins; leaves darker green above; gland dotted below; mature leaves 0.8 to 2 cm long, 11 to 27 leaflets, usually oblong-elliptic with entire margins, mature leaflets 1 to 3 cm long, 0.5 to 2 cm wide; leaflets opposite or nearly so, give appearance of 7 to 13 pairs along leaf petiole, on short (1-2 mm) leaflet petiole; flowers, April to July, crowded spike; fruit, purplish pods, 6 to 8 mm long. If lacking prickly glands, probably desert false indigo (*A. fruticosa* L. var. *occidentalis* (Abrams) Kearn. and Peeb.).

Distribution: Dry wooded or brushy slopes, below 2300 m (7500 ft); ponderosa/Jeffrey pine communities and chapar-

al; Santa Rosa, Santa Ana Mountains to Santa Lucia Mountains, San Gabriel, San Bernardino, San Jacinto Mountains.

Fire Response Mechanism: Stump-sprouts readily after fire.

Wildlife Value: Deer and sheep browse leaves.

Cultural Value: Unknown.

Arctostaphylos spp.

Heather Family (*Ericaceae*)

MANZANITAS. Manzanitas (Spanish for "little apples"), evergreen shrubs or small trees with stiff branches and dark reddish-brown bark. Leaves alternate and simple; flowers urn- or bell-shaped. Munz and Keck (1970) list 43 species in California flora, 10 of which occur in area covered by this guide plus Channel Islands. Species differ in fire response mechanisms. Eastwood manzanita is only mainland species in this guide that has a basal burl, therefore, can vigorously resprout after fire. One Channel Island species (Woollyleaf Manzanita, *A. tomentosa* [Pursh] Lindl.) also forms a burl. Other species depend primarily in seedlings for post-fire recovery.

Wildlife Value: Low value browse, new growth eaten by deer; if heavily used, indicate range problems; berries, staple of many animals including fox, raccoon, skunk, coyote, quail, bear.

Cultural Value: Native American, very valuable for food, medicine, shelter, pleasure (Sweet 1962). Pulp of berries soaked in water for tart beverage; seeds ground into meal; leaves mixed with tobacco or steeped in water for tea to relieve diarrhea or wash poison oak rash (Clarke 1977).

- 1a. Root crown burl present, (detected as swollen collar near ground surface in zone between above-ground stems and roots); leaves oblong, somewhat mucronate, dull green, hairy; sometimes sticky; in chaparral, conifer woodlands, or forests.

EASTWOOD MANZANITA *A. glandulosa*

- 1b. Root crown burl not present.
 - 2a. Leaves usually oblong to oval, sometimes obovate; tip usually mucronate.
 - 3a. Leaves usually glaucous or waxy in appearance; locally common shrub; on dry chaparral slopes.

BIGBERRY MANZANITA, *A. glauca*

- 3b. Leaves not glaucous or waxy appearing.
- 4a. Majority of petioles have appearance of being at right angle with stem; young stems, dense glandular pubescence or villous (do not appear shiny green); dry chaparral, pine woodland slopes, San Bernardino Mountains to Baja California.

PINK-BRACTED MANZANITA,

A. pringlei var. *drupacea*

- 4b. Petioles not commonly appear at right angles with stem, young stems glabrous to finely glandular pubescent or pubescent (usually appear shiny green); dry chaparral to conifer woodland slopes, Santa Rosa, San Gabriel Mountains, north to Tehachapi Mountains.

PARRY MANZANITA, *A. parryana*



Figure 10-Eastwood manzanita, *Arctostaphylos glandulosa* (McMinn 1939).



Figure 11-Bigberry manzanita, *Arctostaphylos glauca* (McMinn 1939).

2b. Leaves mostly elliptic; commonly, tips gradually narrow to a point; rarely mucronate.

5a. Leaves green, more or less shiny, usually hairless; leaf venation usually impressive to eye; dry, transmontane slopes in chaparral, oak, and conifer communities. MEXICAN MANZANITA, *A. pungens*

5b. Leaves green to yellowish green, not particularly shiny, usually more or less pubescent; venation less impressive than above; dry chaparral, San Diego County. OTAY MANZANITA, *A. otayensis*

A. glandulosa Eastw.

EASTWOOD MANZANITA (CROWN MANZANITA) (fig. 10). Evergreen spreading shrub with basal burl, 1.5 to 2.5 m tall; smooth reddish stems, coarse hairy, greenish, glandular branchlets; glandular sheath shed with maturity leaving red bark-covered stems (only ssp. *glandulosa* has glandular branchlets); mature leaves stiff and leathery, elliptic-ovate or lanceolate, margins entire; leaves dull green or yellowish, pointed at tips, more or less glandular-pubescent on leaf margins and both surfaces, becoming glabrate with age but retains somewhat rough feel, 3 to 6 cm long, 1 to 4 cm wide, mature leaves nearly flat, petiole 5 to 12 mm long, seedling leaves same shape but dentate margin; flowers, February to May, white bloom subtended by sticky, lance-shaped, persistent pubescent bracts; fruit, berry-like, about 8 mm across, green glandular and sticky when immature, eventually reddish brown and less sticky, glandular (only ssp. *glandulosa*, glandular fruit).

Distribution: Common shrub, 300 to 1800 m (1000-6000 ft); chaparral, mixed conifer to ponderosa and Jeffrey pines; coast ranges, to Cuyamaca Mountains, San Diego County, north to Oregon.

Fire Response Mechanism: Stump sprouts from enlarged burls after fire or cutting.

Wildlife Value: Poor browse, berries desired.

Cultural Value: See genus.

A. glauca Lindl.

BIGBERRY MANZANITA (fig. 11). Evergreen, erect shrub or small tree without basal burl, 2 to 4 (to 6 m) tall, smooth red-brown mature bark and/ or waxy appearing green to pale green, hairless to finely pubescent young twigs; old bark more or less continually shed; somewhat glaucous gray green leaves, stiff, leathery, flat, ovate to oblong, rounded to tapering at apex, 2.5 to 4.5 cm long, 1 to 3 cm wide, petioles 6 to 12 mm long; flowers, December to March, white to pinkish, urn-shaped, about 8 to 9 mm long; young fruit, sticky glandular berry, 12 to 15 mm diameter.

Distribution: Common on dry slopes below 1400 m (4500 ft); chaparral; mountains, southern California northward to Mt. Hamilton, Mt. Diablo, south to Baja California.

Fire Response Mechanism: Nonsprouter, obligate seeder after fire.

Wildlife Value: See genus.

Cultural Value: See above for genus. Native American, especially desired for large fruit.



Figure 12-Otay manzanita, *Arctostaphylos otayensis* (McMinn 1939).

A. otayensis Wies. & Schreib.

BIGBERRY MANZANITA, OTAY MANZANITA (*fig. 12*). Erect evergreen shrub, to 2.5 m tall, without basal burl, reddish to red-brown mature stems; young stems hairy, sometimes with few glandular hairs; mature leaves stiff and leathery, elliptical to ovate, rarely with mucronate tip, 1 to 4.5 cm long, 0.6 to 2.5 cm wide; petioles, 2 to 10 mm long, pubescent, leaves slightly to densely pubescent or glandular pubescent, grayish green to green both sides, sometimes darker above; flowers, February to April, white to rose, urn-shaped, 3 to 6 mm long, subtended by leafy bracts, in open panicles or racemes; fruit, round berry becoming pale brown or red, 3 to 5 mm across, contains solid nut.

Distribution: Dry slopes, 550 to 1500 m (1800-5000 ft); chaparral; San Diego Mountains, especially Laguna Mountains.

Fire Response Mechanism: Nonsprouter; apparently obligated to regenerate by seedlings after fire.

Wildlife Value: See genus.

Cultural Value: See genus.

A. parryana Lemmon

PARRY MANZANITA (*fig. 13*). Evergreen, diffusely spreading shrub without basal burl, 1 to 2 m tall, without enlarged root-crown, bark on main stems reddish brown; lateral branches lie on ground, sometimes root on contact; branchlets and petioles canescent to glabrous, not glandular; stiff, leathery leaves, bright green, somewhat shiny, darker above, hairless, ovate, elliptic or broadly oval, entire margins, flat, rounded or acute to a point at apex, 2 to 4.5 cm long, 1 to 3 cm



Figure 13-Parry manzanita, *Arctostaphylos parryana* (McMinn 1939).

wide, on petioles 5 to 10 mm long; flowers, February to April, white, urn-shaped, 6 to 7 mm long, few-flowered clusters; fruit, dark red berry, 5 to 12 mm, hairless, nutlets usually separable, sometimes fused.

Distribution: Dry slopes, 1200 to 2300 m (4000-7500 ft); chaparral, ponderosa and Jeffrey pine to mixed conifer; Santa Rosa Mountains to San Gabriel Mountains, Mt. Pinos area to Tehachapi Mountains. Similar sp. *Arctostaphylos patula* var. *platyphylla* (Grey) Wells, glandular-pubescent branchlets, petioles, inflorescence; dry slopes, 1500 to 2700 m (5000-9000 ft); in ponderosa and Jeffrey pine to mixed conifers, Santa Rosa Mountains to San Gabriel Mountains.

Fire Response Mechanism: Nonsprouter after fire, cutting; roots from lateral branches on ground; obligate seeder after fire.

Wildlife Value: See genus.

Cultural Value: See genus.

A. pringlei Parry var. *drupaceae* Parry

PINK-BRACTED MANZANITA (*fig. 14*). Evergreen, erect shrub, without basal burl, 2 to 4 m tall, smooth reddish brown shedding bark, young stems greenish becoming red, densely hairy glandular branchlets; leaves stiff and leathery, 2.5 to 5.5 cm long, 1.5 to 3 cm wide, ovate-roundish, gray green, fine hairs, rough to touch on both sides; petioles 5 to 7 mm long; flowers, February to June, rose colored, urn-shaped, 7 to 8 mm long, subtended by lance-shaped deciduous pink bracts,

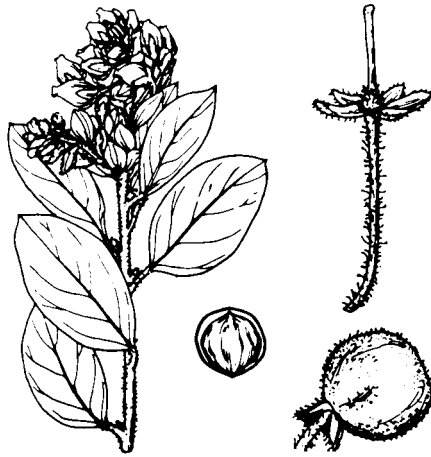


Figure 14-Pink-bracted manzanita, *Arctostaphylos pringlei* var. *drupaceae* (McMinn 1939).



Figure 15-Mexican manzanita, *Arctostaphylos pungens* (McMinn 1939).

5 to 6 mm long; fruit, round berry 6 to 10 mm across, glandular, hairy, becoming red.

Distribution: Dry slopes, 1400 to 2300 m (4500-7500 ft); chaparral, ponderosa and Jeffrey pine; San Bernardino San Jacinto Mountains to Baja California.

Fire Response Mechanism: Nonsprouter; obligate seeder after fire.

Wildlife Value: See genus.

Cultural Value: See genus.

A. pungens H.B.K.

MEXICAN MANZANITA (fig. 15). Erect evergreen shrub without basal burl, 2 to 3 m tall, smooth red brown bark, grayish with age, finely hairy twigs; leaves bright green, shinier above, hairless, elliptic or obovate, 1.5 to 4 cm long, 1 to 2 cm wide, petioles 3 to 10 mm long; flowers, January to March, white, urn-shaped, 6 mm long; fruit, brown hairless berries, separate or irregularly united nutlets ridged at back.

Distribution: Dry transmontane slopes 900 to 2100 m (3000-7000 ft); chaparral, ponderosa and Jeffrey pine to canyon live oak woodlands and forests; common in San Diego County to Los Angeles and San Bernardino Counties, San Gabriel, San Bernardino, San Jacinto Mountains, to Mexico, Texas.

Fire Response Mechanism: Nonsprouter, without basal burl; roots from branches; obligate seeder after fire.

Wildlife Value: See genus.

Cultural Value: See genus.

Artemisia californica Less. Sunflower Family (Asteraceae)
COAST SAGEBRUSH (fig. 16). Grayish, mostly woody subshrub, 0.5 to 1.5 m tall, evergreen, sage-like odor; young stems, white to yellowish, gray with age; old bark, shreddy; leaves and young stems, woolly; leaves alternate, numerous, dense short leafy branches, divided mostly once or twice into segments, at least upper ones commonly linear and borne in fascicles, 1 to 6.5 cm long, mostly 1 mm or less wide; seedling leaves with shorter and broader segments, 1 to 2 cm long, to 2 mm wide; flowers, August to December, clusters with many nodding heads, 3 to 5 mm wide; fruit, akene.

Distribution: Common, exposed slopes, hills, below 900 m (3000 ft); Marin and Napa Counties south to Baja California.

Fire Response Mechanism: Nonsprouter, exhibits vigorous seedling response after fire.

Wildlife Value: Low value browse.

Cultural Value: Cahuilla Indians, products used to prepare young girls for womanhood; important medicinal plant (Clarke 1977); may have been dried and smoked with tobacco.

A. tridentata Nutt.

BASIN (BIG) SAGEBRUSH (fig. 17). Evergreen shrub, 0.5 to 3 m tall, short trunk; young stems tend to be yellowish to yellowish green, become gray and shreddy with age; simple leaves, opposite and clustered, grayish, spatulate, canescent or pubescent, 1 to 4 cm long, to 8 mm wide, 3-toothed (rarely 4 to 9) at apex, strong sagebrush smell; flowers, July to

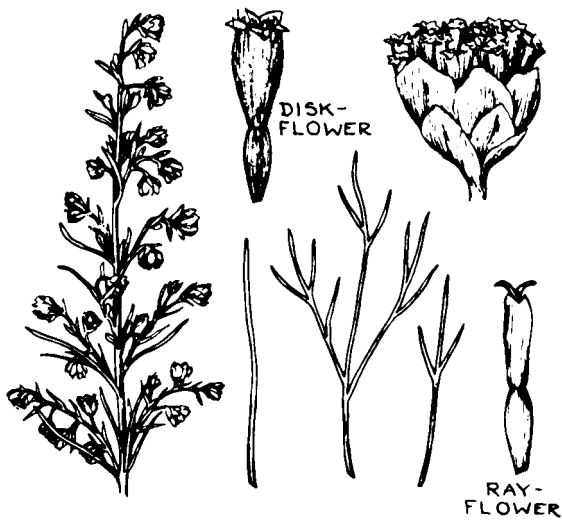


Figure 16-Coast sagebrush, *Artemisia californica* (McMinn 1939).

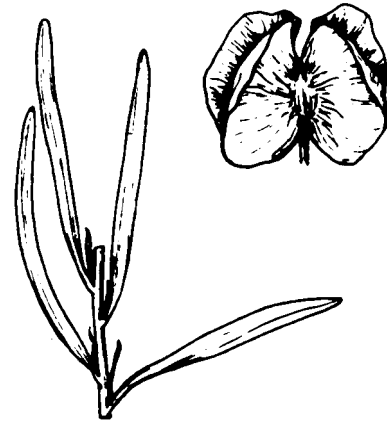


Figure 18-Wingscale saltbush, *Atriplex canescens* (McMinn 1939).



Figure 17-Basin sagebrush, *Artemisia tridentata* (McMinn 1939).

November, narrow clusters, spike or panicle of many small heads persisting after fruiting; fruit, akene.

Distribution: Dry slopes and plains, 450 to 3200 m (1500-10,600 ft); sagebrush, ponderosa pine, Jeffrey pine, western juniper, and pinyon juniper; Laguna Mountains, San Diego County, western edge of deserts to Sierra Nevada, Rocky Mountains to Canada, to Baja California.

Fire Response Mechanism: Fibrous root system, occasionally root-sprouting after fire, cutting; indicator of deep soils.

Wildlife Value: Staple when eaten with other forage, decreases amount of essential oils in sagebrush which act as rumen flora inhibitors.

Cultural Value: Cahuilla Indians, source of medicine and food (Clarke 1977).

Atriplex canescens (Pursh) Nutt.

Goosefoot Family (*Chenopodiaceae*)
WINGSCALE SALTBUUSH (SHADSCALE) (fig. 18). Evergreen, erect, stiff-branched dioecious shrub, 0.4 to 2 m tall, gray scaly or scurfy branches, young branchlets, yellowish green, become yellow gray with age; leaves alternate, often crowded in bunches, not fascicled, linear-spatulate or narrowly oblong, margins entire, 1 to 5 cm long, 2 to 8 mm wide, often somewhat rolled under (not revolute), gray to olive colored, slightly darker above with dense scurf (scales) on both sides, curled under at edges. Male and female flowers, July to August, separate plants, clusters arise from leaf axils, floral

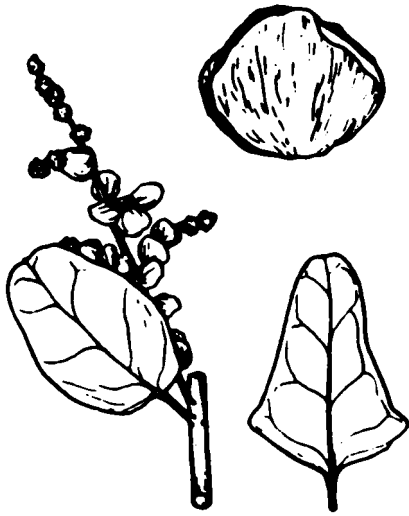


Figure 19-Lenscale saltbush, *Atriplex lentiformis* (McMinn 1939).

racemes become more leafy toward base; fruits, 4-winged utricles, single seed, wings entire or dentate.

Distribution: Dry slopes, flats, washes, below 2200 m (7000 ft); saltbush, creosote, pinyon juniper and subsaline sinks; deserts, San Diego and Los Angeles Counties, east to Kansas and Texas, south to Baja California.

Fire Response Mechanism: Fire resistant; nonsprouter, tap-root deep as 9 to 12 m (30-40 ft).

Wildlife Value: Fruits, preferred food by birds, rodents; staple browse for wildlife and livestock, concentrated feeding may cause scours in livestock.

Cultural Value: Native Americans, ground seed for meal and emetic; saliva moistened, ground roots or flowers to soothe ant bites; ashes stirred into water bread, changed color of meal to greenish blue (Sweet 1962).

A. lentiformis (Torr.) Wats.

LENSCALE SALTBUH (*fig. 19*). Widespreading leafy dioecious shrub, 1 to 3 m tall, often wider than tall; young twigs yellowish brown becoming grayish brown; leaves alternate, triangular or ovate, truncate to wedge-shaped at base, blunt point, deciduous in desert forms, tend to be evergreen elsewhere, 1.0 to 5 cm long, 0.5 to 4 cm wide, 1-veined from base, sessile or on short petiole, grayish, fine-scaly surface; tiny flowers, August to October, long clusters; fruit, bracts flattish or convex, 3 to 7 mm long. Ssp. *lentiformis*, most common in desert; most common southern California chaparral ssp. *breweri* (Wats.) H. & C., usually with larger leaves, often monocious (Munz 1974).

Distribution: Along coast, in desert, saline places mostly from 500 m (1600 ft) and below; in coastal sage scrub (soft chaparral) and saltbush; Santa Barbara County to Santa Monica foothills, Orange County.

Fire Response Mechanism: Somewhat fire resistant foliage; profuse seeder.

Wildlife Value: Preferred browse of mule deer, livestock; seeds important to many animals.

Cultural Value: Probably same as for wingscale saltbush (*A. canescens*).

Baccharis spp. Sunflower Family (*Asteraceae*)

1a. Leaves lance shaped to linear.

2a. Leaves linear, up to 2 cm long, not glutinous or slightly so; branches somewhat resinous, often nearly leafless; shrub on sandy washes usually near water courses, coastal sage, and creosote bush scrub.

BROOM BACCHARIS, *B. sarothroides*

2b. Leaves lance shaped, mature leaves more than 2 cm long, usually somewhat glutinous, stems leafy and not resinous; shrub, common along streams and other moist ground below 900 m, associated with coastal sage scrub and chaparral.

MULEFAT (STICKY BACCHARIS), *B. glutinosa*

lb. Leaves somewhat wedge shaped in outline; shrub, common on coastal strand, coastal sage scrub, below 900 m elevation.

CHAPARRAL BROOM,

B. pilularis ssp. *consanguinea*

B. glutinosa Pers.

MULEFAT (STICKY BACCHARIS or SEEP-WILLOW) (*fig. 20*). Willow-like evergreen shrub, 1 to 3 m tall; slender, straight, relatively unbranched stems; young stems somewhat herbaceous and greenish to reddish, may be pubescent, become yellowish to brown with age; light green shiny leaves, color equal above and below, commonly glutinous, small pits on underside of leaves, alternate leaves lance-shaped, willow-like, 5 to 15 cm long, 7 to 22 mm wide, sessile or on short petiole (to 2 mm), tapering at both ends with some serration above middle or entire, single midvein or with long lateral veins arising from near base of midvein, soon becoming parallel; flowers, most of year, terminal clusters, numerous, bracts on flower heads, 4 mm long, 3 to 4 series of straw-colored bracts; fruit, small ribbed akene.

Distribution: Along streams, moist ground, to 900 m (3000 ft); throughout southern California, north to Owens Valley, Inyo County, to Texas, Mexico, Chile.

Fire Response Mechanism: Stump-sprouts after fire, cutting.

Wildlife Value: Low-value browse plant.

Cultural Value: Unknown.

B. pilularis DC. ssp. *consanguinea* (DC.) Ktze.

CHAPARRAL BROOM (*fig. 21*). Erect, much-branched evergreen shrub, straight green branchlets become brown with age, 1 to 4 m tall; alternate leaves numerous, somewhat wedge-shaped, dark green, may be darker above, 1.0 to 4 cm long, 5 to 15 mm wide, or 1- or somewhat 3-veined from the

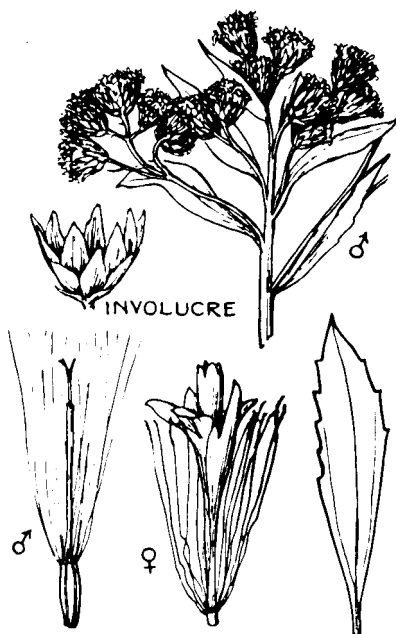


Figure 20-Mulefat, *Baccharis glutinosa* (McMinn 1939).

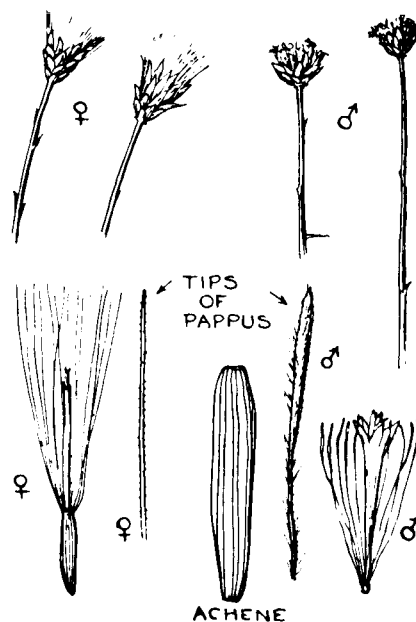


Figure 22-Broom baccharis, *Baccharis sarothroides* (McMinn 1939).



Figure 21-Chaparral broom, *Baccharis pilularis* ssp. *consanguinea* (McMinn 1939).

base, irregularly toothed (dentate) margins above lower one-third, teeth few to 6 or 7 points or sometimes entire; flowers, August to December, numerous heads on branchlets, brownish white, may make plant appear woolly; fruit, small ribbed akene. Similar species, with hairy-sticky leaves, is Plummer Baccharis (*B. plummerae* Gray); Los Angeles to Santa Barbara Counties.

Distribution: Common along coastal hills and inland, to 900 m (3000 ft); coastal strand, coastal sage scrub (soft chaparral), chamise chaparral; north San Diego County to Oregon.

Fire Response Mechanism: Colony forming, recommended for dune fixation; presumably root-sprouter after fire.

Wildlife Value: Staple browse for mule deer; seeds eaten by quail, etc.

Cultural Value: None known.

B. sarothroides Gray.

BROOM BACCHARIS (fig. 22). Erect shrub, 2 to 4 m tall, with grooved broom-like, green, somewhat resinous stems, branchlets becoming reddish with gray-textured bark, stems nearly leafless below; leaves alternate, approximately linear, rigid, entire, 0.6 to 2 cm long, 1 to 2 mm wide; flowers, June to October, heads 5 to 8 mm long, cream colored or brownish; fruit, ribbed akene.

Distribution: Sandy washes or soils, mostly below 300 m (1000 ft); coastal sage scrub (soft chaparral) to creosotebush;



Figure 23-Barberry, *Berberis dictyota* (McMinn 1939); renamed *Mahonia dictyota*.

San Diego County to Baja California, Colorado Desert.

Fire Response Mechanism: Unknown.

Wildlife Value: Unknown.

Cultural Value: Unknown.

Berberis dictyota Jeps. Barberry Family (*Berberidaceae*)
BARBERRY (fig. 23). Species renamed *Mahonia dictyota* Fedde. and listed as a synonym (Munz 1974). *Berberis dictyota* retained to be consistent with Munz. Evergreen shrub with erect stems, few branched, to 1.8 m tall; leaves alternate, compound, divided into five (rarely 3 or 7) holly-like leaflets, 3 to 5 cm long and 1.5 to 3 cm wide, green above, paler and white-filmy below, with prominent midvein, margins wavy with stiff spines; leaves on petiole to 1 cm long; flowers, February through May, yellow in drooping racemes; fruit, berry 6 to 7 mm long, blue black or filmy. If leaves are large oval shaped, glossy-green on both surfaces or somewhat darker above with up to nine leaflets, terminal leaflet to 8 cm long, 5 cm wide, it is shiny-leaf Barberry (*B. pinnata* Lag.); if leaflets lance-shaped, terminal leaflets mostly less than 4 cm long, 1 cm wide, all less than 2 cm wide, it is the rare *B. nevinnii* Gray, and location should be reported to a local land management agency or university botanist.

Distribution: Local, dry rocky foothills, 600 to 1800 m (2000-6000 ft); chaparral and oak to ponderosa and Jeffrey pine communities.

Fire Response Mechanism: Suckers, root-sprouts after fire.

Wildlife Value: Low value browse and fruits.



Figure 24-Brickellbush, *Brickellia californica* (McMinn 1939).

Cultural Value: Important medicinal source for ulcers, served as tonic and flavoring for soup, etc. (Sweet 1962).

Brickellia californica (T. & G.) Gray

Sunflower Family (*Asteraceae*)

BRICKELLBUSH (fig. 24). Rounded, aromatic subshrub, with many stems from woody base young stems pubescent, light brown, becoming darker; leaves alternate, pubescent, deltoid to ovate, sometimes taper to blunt point, with rounded serrations, rarely heart-shaped at base, 1 to 4 cm long, petiole 1 to 5 mm long; flowers, June to November, cream-colored heads on pedicels, arise from leaf axils and in small, terminal clusters, somewhat leafy; fruit, ribbed akene. *Distribution*: Washes, dry slopes, below 2100 m (7000 ft); coastal sage scrub (soft chaparral), chamise; Sierra Nevada foothills, Humboldt County, south to southern California, Mexico.

Fire Response Mechanism: Believed to be nonsprouter or poor sprouter after fire.

Wildlife Value: Low value or staple browse.

Cultural Value: Unknown.

Ceanothus spp. Buckbrush Family (*Rhamnaceae*)

CALIFORNIA-LILACS. Shrubs or small trees, mostly evergreen, in southern California. Leaves simple, alternate or opposite, deciduous or evergreen. Flowers, small, five-parted, spoon-shaped petals, glandular disk. Fruit, 3-lobed capsule; when viewed from top, bears mark similar to Mercedes Benz

insignia. Of 60 species in the genus, 40 native to California, 17 to southern California.

Wildlife Value: Most species preferred for browse by deer, bighorn sheep.

Cultural Value: Southern California species seem not to have been heavily used; available information suggesting its use difficult to find. Flowers of several species can be used as substitute for soap.

1a. Leaves opposite.

2a. Leaves usually flat, spatulate to obovate, sometimes notched at apex, smooth margins; common on dry chaparral and conifer woodland slopes below 1800 m.

BUCKBRUSH, *C. cuneatus*

2b. Leaves mostly cupped upwards or rolled downward at edges.

3a. Leaves commonly rolled downward, never cupped upward, dull green above, distinctly white-tomentose below, vaguely oak appearing leaf; common in chaparral below 1100 m.

HOARYLEAF CEANOTHUS, *C. crassifolius*
3b. Leaves commonly cupped upwards, usually pubescent below, sometimes tomentose on both sides, rarely rolled downward, grayish green to yellowish green above, gray below; locally common in chaparral, sagebrush, and pine woodlands.

CUPLEAF CEANOTHUS, *C. greggii*

1b. Leaves alternate.

4a. Plants with spine-tipped twigs.

5a. Leaves with three veins from base, sometimes laterals less significant; leaves dull green with whitish film above and below or grayish without film below.

6a. Leaves with whitish film on both surfaces, lateral veins sometimes obscure; dry chaparral slopes below 1800 m.

CHAPARRAL WHITETHORN,

C. leucodermis

6b. Leaves with whitish film above, gray below; dry, open conifer slopes above 1500 m.

MOUNTAIN WHITETHORN,

C. cordulatus

5b. Leaves with one main vein, hairless and shiny on both surfaces; dry coastal sage scrub and chaparral slopes below 900 m.

GREENBARK CEANOTHUS, *C. spinosus*

4b. Plants without spine-tipped twigs.

7a. Leaves mostly 3-veined from base, more or less hairy.

8a. Leaves serrated, young branchlets reddish brown to olive and hairy or warty on a more villous petiole; western Riverside County and northward; dry slopes below 1400 m.

HAIRY CEANOTHUS, *C. oliganthus*

8b. Leaves entire or serrated, young branchlets green to yellowish and glabrous (sometimes

strigose) or reddish and tomentose, petioles not much more or less pubescent than leaves.

9a. Leaves with dark serrations at margins, young branchlets reddish and hairy; . Redlands area to Santa Ana Mountains and south, in chamise and mixed chaparral below 1100 m.

WOOLLYLEAF CEANOTHUS,

C. tomentosus var. *olivaceous*

9b. Leaf margins usually entire to somewhat fine-toothed near tip, greenish branchlets usually glabrous or somewhat pubescent; woodlands on dry slopes and ridges between 300 and 1800 m.

DEER BRUSH, *C. integerrimus*

7b. Leaves mostly 1-veined.

10a. Leaves usually more than 2 cm long, more than 10 mm wide; woodlands on dry slopes and ridges between 300 and 1800 m.

DEER BRUSH, *C. integerrimus*

10b. Leaves usually less than 2 cm long, less than 15 mm wide.

11a. Leaves dull green, smooth above with grayish white fine hairs below; near coast, below 600 m in chaparral.

BIGPOD CEANOTHUS,

C. megacarpus

11b. Leaves dark green, smooth above, very fine hairs below; coastal hills in coastal sage scrub and chamise chaparral.

WARTY STEM CEANOTHUS,

C. verrucosus

C. cordulatus Kell.

MOUNTAIN WHITETHORN (SNOW BRUSH) (fig. 25). Much branched, spiny shrub, 1 to 2 m tall, smooth whitish or grayish bark; leaves alternate, more or less clustered bundles, evergreen, ovate or elliptic, tapering to a point at apex, rounded at base, mostly entire, 1 to 3 cm long, 0.5 to 2 cm wide, 3-veined, dull green, pubescent, filmy coating above, lighter green to grayish below; flowers, May to July, 2 to 6 cm long, dense white clusters; fruit, capsule with slight crests (horns) 4 to 6 mm across, somewhat sticky before maturity. *Distribution:* Dry open slopes, flats; 1500 to 2900 m (5000-9500 ft); in mixed conifer, yellow pine, mostly above yellow pine; San Jacinto Mountains, north to Sierra Nevada; Oregon, Nevada, and Baja California.

Fire Response Mechanism: Stump-sprouts after fire; seed-sprouter.

Wildlife Value: Provides staple or preferred browse for deer and bighorn sheep; fruit eaten by birds, small mammals. Poor for livestock, except sheep and goats.

Cultural Value: None known.

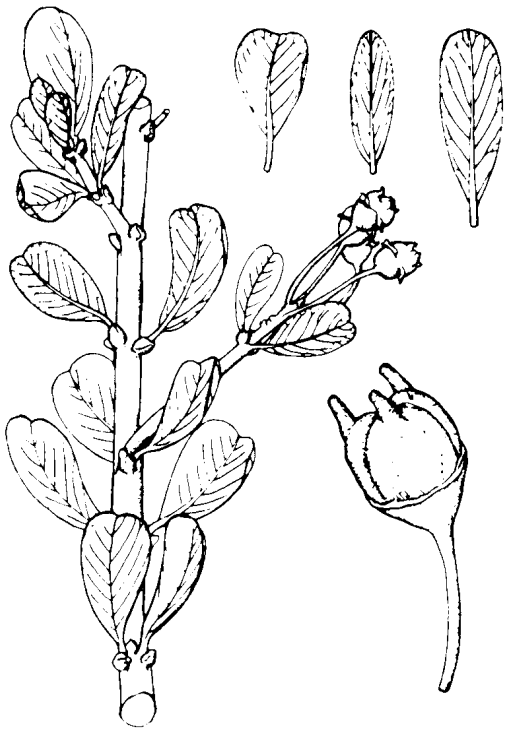


Figure 25- Mountain whitethorn, *Ceanothus cordulatus* (McMinn 1939)



Figure 27-Buckbrush, *Ceanothus cuneatus* (McMinn 1939).

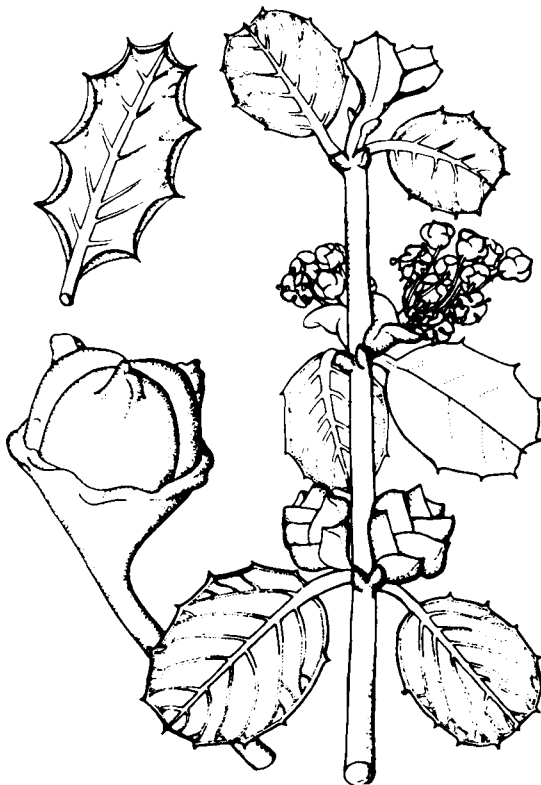


Figure 26-Hoary leaf ceanothus, *Ceanothus crassifolius* (McMinn 1939).

C. crassifolius Torr.

HOARY LEAF CEANOTHUS (fig. 26). Much-branched shrub, 2 to 3.5 m tall; grayish, brown, or white branches with wart-like protrusions at nodes; leaves, evergreen, opposite, thick, leathery, rounded to spatulate, elliptic, or ovate 1.5 to 3.5 cm long, 0.8 to 2.5 cm wide, commonly revolute (edges curled under), olive green above, white-fuzzy below, coarsely dentate or sometimes entire leaf petiole less than 5 mm long; flowers, January to April, white clusters, inflorescences 1.5 to 3 cm long; fruit, roundish, sticky capsule, 6 to 8 mm diameter. Var. *planus* Abrams. with flat leaves occurs in Santa Barbara and Ventura Counties.

Distribution: Common below 1100 m (3500 ft); chaparral; Santa Barbara County to Baja California.

Fire Response Mechanism: Rarely stump-sprouts from exposed roots, otherwise nonsprouter after fire, obligate seeder.

Wildlife Value: Provides staple browse for deer; fruit preferred by birds, small mammals, insects.

Cultural Value: Unknown.

C. cuneatus (Hook) Nutt.

BUCKBRUSH (fig. 27). Rigid shrub 1 to 3.5 m tall, bark soon becomes grayish; leaves, evergreen on spur-like divergent, rigid branchlets, sometimes several at a node, opposite, sometimes notched at apex or almost entire and spatulate to ovate, gray green, hairless or pubescent above, firm, 0.5 to 1.5 cm long, 3 to 10 mm wide, flat or sometimes rolled downward at margins; flowers, white, March to May; fruit, capsule 5 to 6 mm with short erect horns. Primary seedling leaves serrated and spatulate, larger (2+ cm long, 1+ cm wide), less stiff than on mature plants, cotyledons entire and nearly oval.

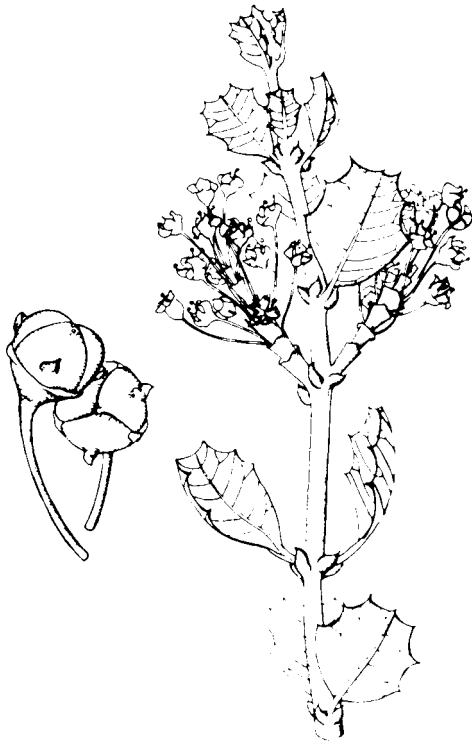


Figure 28-Cup-leaf ceanothus, *Ceanothus greggii* var. *perplexans* (McMinn 1939).

Distribution: Common on dry slopes and fans below 1800 m (6000 ft); chaparral, pinyon juniper, Jeffrey pine and ponderosa pine communities; Oregon to Baja California.

Fire Response Mechanism: Obligate seeder, seedlings usually prolific after fire. Can regenerate from exposed roots.

Wildlife Value: Important browse and cover. Seeds preferred by small animals, insects, birds.

Cultural Value: Unknown.

C. greggii Gray var. *perplexans* (Trel.) Jeps.

CUPLEAF CEANOTHUS (fig. 28). Plant erect, rigidly and intricately branched, 1 to 2 m tall, young branchlets with greenish bark soon become gray; leaves, evergreen, opposite, roundish to broadly elliptical or ovate, commonly cupped upward, 1 to 3 cm long, 8 to 20 mm wide, petiole 1 to 4 mm long, mostly conspicuously toothed, yellowish green, hairless to pubescent or rarely tomentose above, usually tomentose below; flowers, March to May, cream-colored clusters; fruit, rounded capsule 4 to 5 mm across, small horns on sides of capsule.

Distribution: Dry slopes below 2100 m (7000 ft); in chaparral, sagebrush, pinyon juniper, Jeffrey or ponderosa pine, south face of San Bernardino Mountains to Lower California. Var. *vestitus* (Greene) McMinn. grayish green on both leaf surfaces, margins entire or dentate, cupped, 7 to 15 mm long, occurs on San Jacinto Ranger District and in Lake Hughes-Sawmill Mountain area of eastern Los Padres National Forest (Los Angeles County).



Figure 29-Deerbrush, *Ceanothus integerrimus* (McMinn 1939).

Fire Response Mechanism: Nonsprouter after fire, cutting; obligate seeder.

Wildlife Value: Staple browse for wildlife and livestock, especially goats, in winter and early spring. Seeds preferred by small mammals, birds, insects.

Cultural Value: None known.

C. integerrimus H. & A.

DEERBRUSH (fig. 29). Loosely branched, 1 to 4 m tall, glabrous (sometimes strigose) green or yellowish branches, some young twigs, green turning reddish, somewhat pubescent, twigs flexible, not spinose; semideciduous to deciduous; leaves flexible, alternate, either pinnate (1-veined) or 3-veined from base, broadly ovate to elliptic, rounded at base, tapering or somewhat rounded at apex, 2.5 to 7 cm long, 1 to 4 cm wide, olive to light green, puberulent to almost bald above, slightly paler and commonly with some hairs on veins below, edges entire to somewhat toothed near the tip, on petioles 6 to 12 mm long; flowers, May to July, white to dark blue, rarely pink, on branched flower clusters 4 to 15 cm long; fruit, somewhat rounded capsule 4 to 5 mm wide, usually with small horns. *Ceanothus integerrimus* var. *puberulus* (Green) Abrams. also in southern California chaparral and distinctly 3-veined from base.

Distribution: Dry slopes and ridges, 300 to 1800 m (1000-6000 ft); ponderosa and Jeffrey pine, mixed conifer; Riverside County or northern San Diego County, Cuyamaca Moun-



Figure 30-Chaparral whitethorn, *Ceanothus leucodermis* (McMinn 1939).

tains to Santa Rosa and San Gabriel Mountains, Ventura County north to Santa Cruz.

Fire Response Mechanism: Stump-sprouts after fire, cutting.

Wildlife Value: Preferred browse of deer and bighorn sheep. Important forage plant for livestock; valuable honey plant.

Cultural Value: None known.

C. leucodermis Greene.

CHAPARRAL WHITETHORN (fig. 30). Evergreen shrub, 2 to 4 m tall, rigid spine-tipped branchlets, gray or whitish, bark on young twigs green becoming olive green; leaves alternate, with three somewhat obscure veins, midvein more prominent, 0.5 to 2.5 cm long, 5 to 12 mm wide, petioles 2 to 3 mm long, oval to lanceolate, rounded or tapering to a point at apex, rounded at base, minutely serrate or entire edges, usually hairless, darker above, filmy-white on both surfaces, sometimes hairs on veins below; flowers, February to June, white or blue clusters 3 to 8 mm long; fruit, capsule 4.5 to 6 mm wide, sticky, without horns, depression in top center. Seedling leaves serrate, oval to lanceolate; cotyledons entire. **Distribution:** Dry slopes below 1800 m (6000 ft); chaparral; mountains of southern California, north along Coast Ranges, Santa Cruz to Humboldt and Siskiyou Counties.

Fire Response Mechanism: Stump-sprouts after fire, cutting.

Wildlife Value: Preferred browse and cover for deer; also bighorn, if stands are open. Fruit staple for small animals, birds, insects.

Cultural Value: None known.

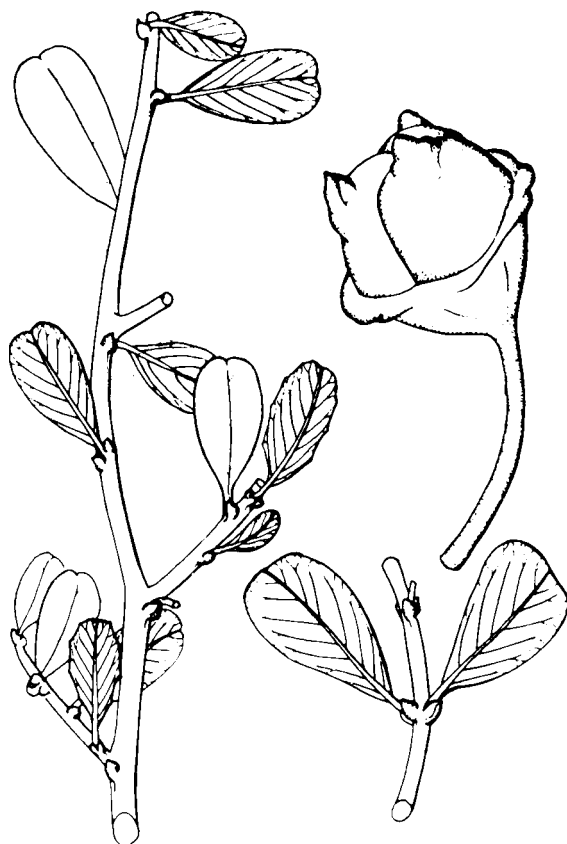


Figure 31-Bigpod ceanothus, *Ceanothus megacarpus* (McMinn 1939).

C. megacarpus Nutt.

BIGPOD CEANOTHUS (fig. 31). Large shrub, 1 to 4 m tall, grayish brown or reddish branches, young branchlets commonly with fine, stiff hairs, soon becoming gray, older bark rough; leaves alternate, spatulate to obovate with smooth margins, sometimes notched at tip, wedge-shaped at base, 0.5 to 2.5 cm long, 6 to 12 mm wide, petiole 2 to 3 mm, 1-veined, thick and leathery, sometimes rolled under at edges, dull green and smooth above, grayish white fine hairs below; flowers, January to April, white; fruit, capsule 8 to 12 mm broad.

Distribution: Near coast, below 600 m (2000 ft); chaparral; Santa Barbara to Orange County to San Diego County.

Fire Response Mechanism: Probably obligate seeder after fire.

Wildlife Value: Provides browse and cover for deer. Flowers used by insects; seeds used by small mammals, birds, insects.

Cultural Value: None known.

C. oliganthus Nutt.

HAIRY CEANOTHUS (fig. 32). Shrub, 1 to 4 m tall, younger branches round, reddish to olive, hairy or warty; leaves alternate, evergreen, 1.0 to 4 cm long, 5 to 20 mm wide, villous, petioles 3 to 8 mm long, oval or ovate to lanceolate with fine serrate margins, dark green above, paler below, scattered long hairs to hirsute pubescent especially on veins below, often with two long veins curving upward to parallel midveins, flowers, February to May, blue or purplish clusters; fruit, capsule 4 mm broad, usually somewhat sticky. Deer-



Figure 32-Hairy ceanothus, *Ceanothus oliganthus* (McMinn 1939).

brush (*C. integerrimus*) may also key out to this species but differs from hairy ceanothus; leaves thin, less hairy, usually without serrations, with greenish yellow bark and branches--not reddish.

Distribution: Dry slopes below 1400 m (4500 ft); Los Angeles, west Riverside Counties, north to San Luis Obispo.

Fire Response Mechanism: Stump-sprouts after fire, cutting.

Wildlife Value: Provides browse and cover for deer. Seeds used by birds, small mammals, insects. Insects (especially bees) use flowers.

Cultural Value: None known.

C. spinosus Nutt.

GREENBARK CEANOTHUS (fig. 33). Large shrub, 2 to 6 m tall, usually with smooth olive-green bark, main branches flexible, commonly with short, stiff, spine-tipped branchlets angled away from main stems; leaves evergreen, oval to lanceolate to nearly linear or oblanceolate, alternate, thick and leathery, hairless and shiny on both surfaces, margins commonly entire, occasionally denticulate or sometimes with notch at tip (emarginate), lateral veins curve toward tip, 1.2 to 4 cm long, 5 to 15 mm wide, petiole 1 to 6 mm long; flowers, February to May, pale blue or white; fruit, globose, viscid capsule 4 to 5 mm broad, with small horns.

Distribution: Dry slopes below 900 m (3000 ft) coastal sage scrub (soft chaparral) and chaparral; Baja California to San Luis Obispo County.

Fire Response Mechanism: Stump-sprouts after fire, cutting.

Wildlife Value: Provides browse and cover for deer. Flowers

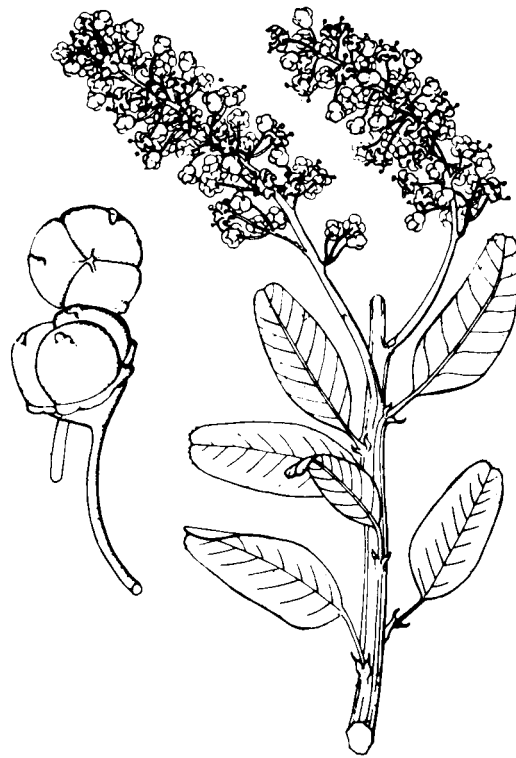


Figure 33-Greenbark ceanothus, *Ceanothus spinosus* (McMinn 1939).

and seeds used by birds, insects, seeds by small mammals, insects.

Cultural Value: None known.

C. tomentosus Parry var. *olivaceus* (Jeps.) Munz

WOOLLYLEAF CEANOTHUS (fig. 34). Evergreen shrub, 1 to 3 m tall, young branchlets, reddish bark with matted hairy surface becoming gray with age; leaves alternate, ovate to elliptic, commonly several at a node, 0.5 to 2.5 cm long, 5 to 15 mm wide, petiole 1 to 5 mm long, dark green with some hairs above, grayish green and pubescent to almost woolly below, 3- or 1-veined from base, dark gland tipped serrations along margins; flowers, January to May, pale blue to white, clusters branched, 2 to 5 cm long; fruit, roundish, sticky capsule about 4 mm across, usually with small horns.

Distribution: Below 1100 m (3500 ft), chamise chaparral, mixed chaparral; Redlands area to Santa Ana Mountains, south to San Diego County, Baja California, merging with hairy ceanothus in Trabuco-Bedford Canyon area.

Fire Response Mechanism: Stump-sprouts vigorously after fire, cutting.

Wildlife Value: Provides browse and cover for deer. Seeds used by small animals, birds, insects. Birds and insects use flowers.

Cultural Value: None known.

C. verrucosus Nutt.

WARTY STEM CEANOTHUS (fig. 35). Erect evergreen shrub, to 4 m tall; leaves 0.8 to 2 cm long, 6 to 15 mm wide,



Figure 34-Woolyleaf ceanothus, *Ceanothus tomentosus* var. *olivaceus* (Munz 1974).

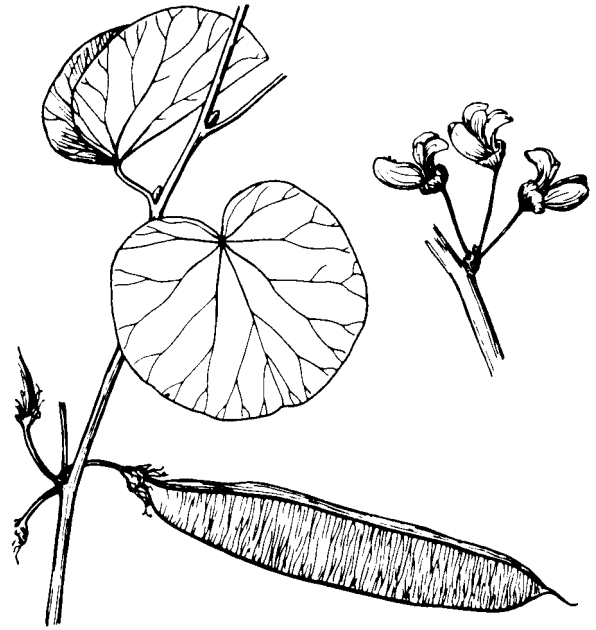


Figure 36-Western redbud, *Cercis occidentalis* (McMinn 1939).



Figure 35-Wartystem ceanothus, *Ceanothus verrucosus*.

petiole less than 4 mm long, alternate, round-to deltoid-ovate, sometimes notched at tip, 1-veined from base, dark green and mostly hairless above, paler below with fine stiff hairs especially on midvein, entire or rarely dentate margins, thick and leathery; flowers, January to April, white clusters 1 to 2 cm long; fruit, round-horned capsule 5 mm across. *Distribution*: Coastal hills and mesas; chamise to coastal sage scrub (soft chaparral); San Diego County to Baja California. *Fire Response Mechanism*: Unknown. *Wildlife Value*: Unknown. *Cultural Value*: None known.

Cercis occidentalis Torr. Pea Family (*Fabaceae*)
WESTERN REDBUD (fig. 36). Deciduous, rounded shrub or small tree, to 5 m tall; mature leaves rounded, often wider than long, 4 to 6 cm long, 4 to 8 cm wide, entire margins, immature leaves commonly reddish, becoming green with maturity, more glossy and darker above, heart-shaped (cordate) at base, 5 to 9 main veins in palmate pattern, leaf smooth, somewhat leathery; flowers, February to April, mostly before leaf development, reddish purple to pink, 5 to 12 mm long; fruit, flat pod, 4 to 9 cm long. *Distribution*: Slopes of Palomar, Laguna, Cuyamaca Mountains 900 to 1400 m (300-4500 ft), becoming more abundant to Shasta and Humboldt Counties. *Fire Response Mechanism*: Not known. *Wildlife Value*: Browsed by deer.



Figure 37-Western mountain-mahogany, *Cercocarpus betuloides* (Munz 1974).

Cultural Value: Bark from young shoots used for baskets, and as mild astringent to treat diarrhea and dysentery (Sweet 1962).

Cercocarpus betuloides Nutt. Rose Family (*Rosaceae*) WESTERN MOUNTAIN MAHOGANY (fig. 37). Erect open evergreen shrub or small tree, 2 to 7 m tall, young twigs reddish becoming reddish brown, mature bark smooth gray; leaves simple, alternate, 1 to 4.5 cm long, 1 to 2.5 cm wide, petiole 3 to 10 mm long, leaf obovate or oval to elliptic, sometimes tapering wedge shape and usually entire below middle, serrate towards apex with short protrusions of veins, more or less pubescent or puberulent on both surfaces, dark green above, paler with evident feather veining below, flowers, March to May, clusters of 2 to 5 blooms, with cylindrical floral tube, first hairy, becoming reddish brown with age; fruit, akene with long, silky, twisting tail.

Distribution: Dry slopes and washes below 1800 m (6000 ft); chaparral, canyon live oak, interior live oak woodlands; Baja California, north to Oregon, east to Nevada.

Fire Response Mechanism: Crown-sprouts after fire, cutting, very palatable at this stage for wildlife.

Wildlife Value: Usually preferred browse for cattle, sheep, goats, deer, bighorn sheep.

Cultural Value: Wood used for fish spears, arrow shafts, digging sticks. Inner bark made purple dye, bark used in tea for treating colds, dried inner bark boiled for lung trouble. Young plant powdered and stirred into water for use as laxative (Sweet 1962).

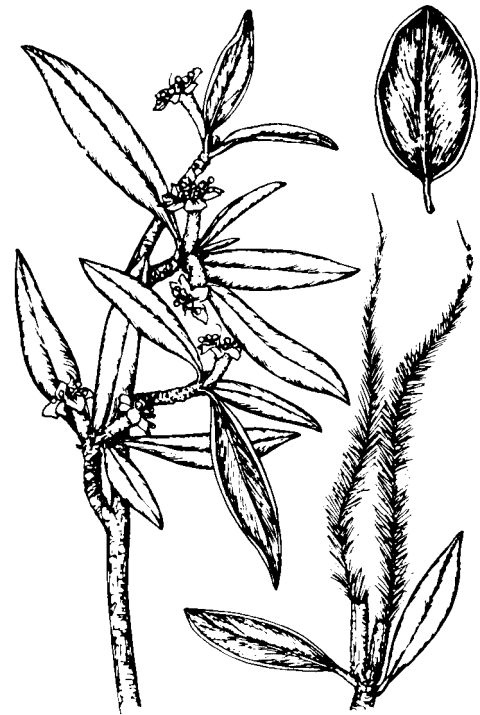


Figure 38-Curlleaf mountain-mahogany, *Cercocarpus ledifolius* (McMinn 1939).

C. ledifolius Nutt.

CURLLEAF MOUNTAIN MAHOGANY (fig. 38). Evergreen shrub or small tree, 2 to 9 m tall, bark gray or reddish, furrowed with age; leaves simple, alternate, green above, grayish below, somewhat pubescent and more so below, nearly linear to lanceolate or elliptic, 1 to 3 cm long, 0.3 to 1 cm wide, pointed at apex, thick and leathery, rolled under at edges; flowers, April or May, one to three attached directly to stems, 4 to 5 mm wide, cylindrical tube 4 to 6 mm long; fruit, 6 to 10 mm long, hairy tail 4 to 7 cm long.

Distribution: Dry rocky slopes 1200 to 3200 m (4000-10500 ft); if fire absent or rare, can be found at lower elevation; one collection made near Mormon Rocks in San Bernardino County at 975 m (3200 ft); sagebrush, pinyon juniper, limber pine, western juniper, yellow pine, and subalpine communities; Santa Rosa, San Jacinto Mountains, north to Washington, Montana, Colorado, Arizona.

Fire Response Mechanism: Nonsprouter, rare in chaparral. Usually not found in areas of frequent fire over large areas.

Wildlife Value: Preferred browse of deer, goats.

Cultural Value: Apparently same as *C. betuloides*.

Chamaebatia australis (Bdg.) Abrams.

Rose Family (*Rosaceae*)

SAN DIEGO MOUNTAIN MISERY (fig. 39). Evergreen shrub 0.6 to 2 m tall, smooth stems with light gray to nearly black bark, sometimes covered with whitish film; leaves compound, alternate, aromatic sticky fern-like foliage, leaves pubescent 3 to 8 cm long, pinnately divided into tiny oval



Figure 39-San Diego mountain misery, *Chamaebatia australis*.

segments or lobes; flowers, November to May, white, five petals, 4 to 5 cm long; fruit, small rounded leathery akene. *Distribution*: Chaparral and sage scrub (soft chaparral) below 600 m (2000 ft); southern San Diego County to Baja California.

Fire Response Mechanism: Rootsprouts after fire, cutting.

Wildlife Value: Low value browse.

Cultural Value: Native Americans probably used this species like a closely related Sierra Nevada species, Sierra mountain misery (*C. foliolosa* Benth.), for treating ailments such as rheumatism, skin eruptions, colds, cough, and occasionally, venereal diseases (Sweet 1962).

Chrysolepis sempervirens (Kell.) Hjelmquist.

Beech Family (*Fagaceae*)

BUSH CHINQUAPIN (*fig. 40*). Evergreen monoecious shrub less than 2.5 m tall with spreading, round-topped growth form, smooth brown gray bark; leaves simple, alternate, 3 to 7.5 cm long, 1 to 2 cm wide, petiole 5 to 15 mm long, mostly obtuse and oblong or oblong-lanceolate to spatulate, margins entire, yellowish or gray green above, golden or pale below, with rusty fuzz; flowers, July through September, ill-smelling male flowers on densely flowered erect catkins, 2.5 to 7 cm long, one to three female flowers at base of male catkin; fruit, matures in two seasons, burr covered with dense coat of long spines, 2 to 3 cm thick, clusters of 2 to 7.

Distribution: Thickets on rocky slopes, ridges 1500 to 3400 m (5000-11,000 ft); in mixed conifer, limber pine, lodgepole, etc.;



Figure 40-Bush chinquapin, *Chrysolepis sempervirens* (McMinn 1939).

San Jacinto and San Bernardino Mountains, north to Oregon.

Fire Response Mechanism: Readily stump-sprouts after fire, cutting.

Wildlife Value: Fruits provide staple food source for birds, rodents. Low value browse for bighorn sheep.

Cultural Value: Spiny burrs contain edible nuts.

Chrysothamnus nauseosus (Pall.) Britton ssp. *bernardinus* (Hall) Hall & Clem.

Sunflower Family (*Asteraceae*)

RUBBER RABBITBRUSH (*fig. 41*). Evergreen mostly wood subshrub 0.5 to 2 m tall, several fibrous-barked main stems from base, gray to whitish, felty branches, leafy, ill-smelling; leaves simple, alternate, with very fine short hair (canescent) especially on young leaves, linear, or divided into linear divisions, 2 to 7 cm long, 0.5 to 4 mm wide; flowers, August to September, yellowish tomentose heads, terminal clusters, 10 to 13 mm long, ray-flowers lacking; fruit, akene. *Distribution*: Dry benches 1200 to 2900 m (4000-9500 ft); ponderosa and Jeffrey pine, pinyon communities; San Gabriel, San Bernardino, and San Jacinto Mountains.

Fire Response Mechanism: Variable stump-sprouter after cutting.

Wildlife Value: Low value.

Cultural Value: Tea from twigs relieved chest pain, toothache.

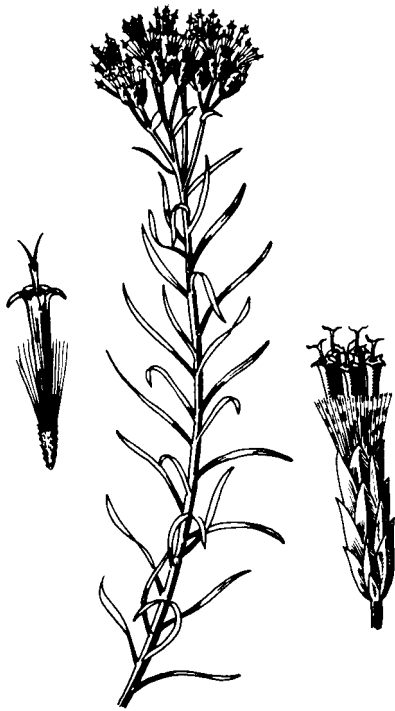


Figure 41-Rubber rabbitbrush, *Chrysothamnus nauseosus* ssp. *bernardinus* (McMinn 1939).



Figure 43-Bushrue, *Cneoridium dumosum* (McMinn 1939).

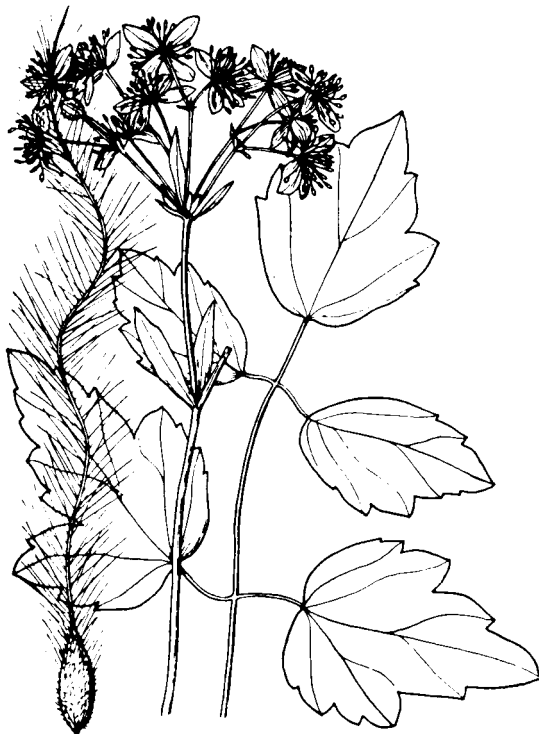


Figure 42-Western clematis, *Clematis ligusticifolia* (McMinn 1939).

Clematis ligusticifolia Nutt.

Buttercup Family (*Ranunculaceae*)

WESTERN CLEMATIS (fig. 42). Woody vine, climbing over shrubs and trees, to 12 m tall; leaves compound, opposite, glabrous, divided into 5 to 7 leaflets, leaflets lance shaped or ovate to palmate, leaf sometimes not divided or otherwise leaflets may be subdivided, nearly entire or 3-lobed, 2 to 11 cm long, 2 to 9 cm long; flowers, June through August, small, in dense clusters; fruit, numerous, hairy-tailed akene, forming fluffy powderpuff-like ball, very noticeable in fall. If leaves are divided into threes, it is pipestem clematis, *C. lasiantha* Nutt. *Distribution*: Along streams, moist places, below 2100 m (7000 ft), in many plant communities; coast ranges and Sierra Nevada to mountains of southern California.

Fire Response Mechanism: Probably nonsprouter or poor sprouter from rootstock, but prolific seeder.

Wildlife Value: Low value, mule deer browse.

Cultural Value: Infusions used by early settlers for sores and cuts on horses, by Native Americans for sore throat, colds (Munz and Keck 1959).

Cneoridium dumosum (Nutt.) Hook.

Rue Family (*Rutaceae*)

BUSH RUE (fig. 43). Low evergreen shrub, to 2 m tall, densely branched, becoming grayish, branchlets slender; leaves simple, more or less oblong, opposite, may be crowded at tips of branchlets, 1 to 2.5 cm long, 1 to 3 mm wide, somewhat resin-dotted foliage strong scented; flowers, November to

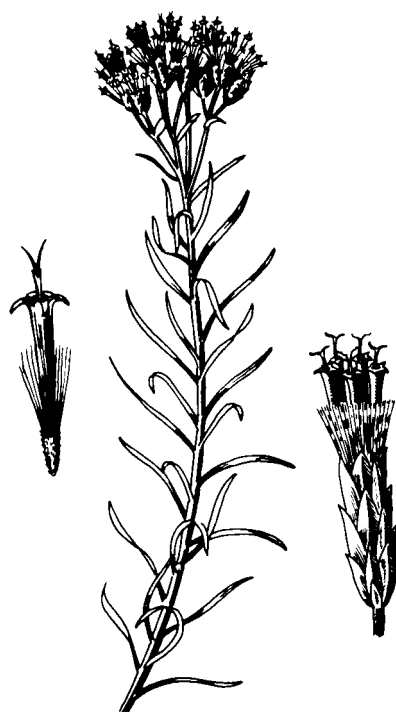


Figure 41-Rubber rabbitbrush, *Chrysothamnus nauseosus* ssp. *bernardinus* (McMinn 1939).



Figure 43-Bushrue, *Cneoridium dumosum* (McMinn 1939).

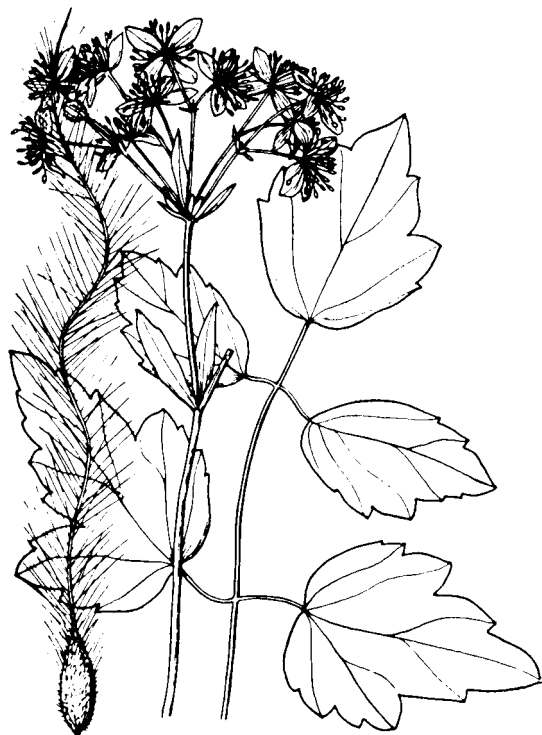


Figure 42-Western clematis, *Clematis ligusticifolia* (McMinn 1939).

Clematis ligusticifolia Nutt.

Buttercup Family (*Ranunculaceae*)

WESTERN CLEMATIS (fig. 42). Woody vine, climbing over shrubs and trees, to 12 m tall; leaves compound, opposite, glabrous, divided into 5 to 7 leaflets, leaflets lance shaped or ovate to palmate, leaf sometimes not divided or otherwise leaflets may be subdivided, nearly entire or 3-lobed, 2 to 11 cm long, 2 to 9 cm long; flowers, June through August, small, in dense clusters; fruit, numerous, hairy-tailed akene, forming fluffy powderpuff-like ball, very noticeable in fall. If leaves are divided into threes, it is pipestem clematis, *C. lasiantha* Nutt. *Distribution*: Along streams, moist places, below 2100 m (7000 ft), in many plant communities; coast ranges and Sierra Nevada to mountains of southern California.

Fire Response Mechanism: Probably nonsprouter or poor sprouter from rootstock, but prolific seeder.

Wildlife Value: Low value, mule deer browse.

Cultural Value: Infusions used by early settlers for sores and cuts on horses, by Native Americans for sore throat, colds (Munz and Keck 1959).

Cneoridium dumosum (Nutt.) Hook.

Rue Family (*Rutaceae*)

BUSHRUE (fig. 43). Low evergreen shrub, to 2 m tall, densely branched, becoming grayish, branchlets slender; leaves simple, more or less oblong, opposite, may be crowded at tips of branchlets, 1 to 2.5 cm long, 1 to 3 mm wide, somewhat resin-dotted foliage strong scented; flowers, November to

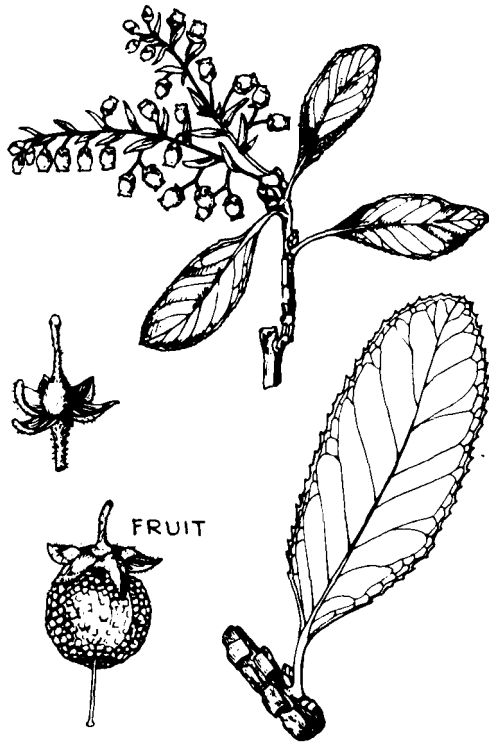


Figure 44-Summer-holly, *Comarostaphylis diversifolia* (McMinn 1939).

March, white, four petals; fruit, fleshy, 1- to 2-seeded capsule, 5 to 6 mm long.

Distribution: Below 800 m (2500 ft); frequent on coastal bluffs, on desert slopes of Cuyamaca Mountains; coastal sage scrub (soft chaparral), chamise communities, Orange County, south to Baja California.

Fire Response Mechanism: Stump-sprouts after fire, cutting. **Wildlife Value:** Low value browse and fruit.

Cultural Value: None known.

Comarostaphylis diversifolia (Parry) Greene.

Heather Family (*Ericaceae*)

SUMMER-HOLLY (fig. 44). Erect, evergreen shrub, 2 to 5 m tall, young branchlets olive and hairy becoming gray with fibrous and shredded bark; leaves simple, alternate, 3.5 to 9.5 cm long, 1 to 3 cm wide, normally leaf somewhat revolute, petioles 2 to 5 mm long, thick and leathery, oblanceolate to ovate, dark green, glabrous above, whitish-fuzzy beneath with prominent midvein, sharp pointed, finely serrated margins sometimes entire; flowers, April to June, white, bell shaped; fruit, warty-skinned red berry containing solid stone. **Distribution:** Dry slopes, mostly well below 550 m (1800 ft) along coast; manzanita and chamise chaparral; Santa Barbara County (Nojoqui Park) to Santa Monica Mountains, to San Diego County, Baja California.

Fire Response Mechanism: Stump-sprouts after fire.

Wildlife Value: Low value.

Cultural Value: Unknown.



Figure 45-American dogwood, *Cornus stolonifera*.

Cornus stolonifera Michx. Dogwood Family (*Cornaceae*) **AMERICAN DOGWOOD** (fig. 45). Spreading shrub, 2 to 5 m tall, brownish or reddish twigs with some short stiff hairs; leaves simple, opposite, lance shaped or elliptic, tapering to a point at tips, 4 to 9 cm long, 1.5 to 5 cm wide, petiole 5 to 10 mm long, nearly glabrous and darker above, covered with short stiff hairs below, obvious lateral veins curving upward; flowers, April to November, small white blossoms, clusters; fruit, smooth, white or bluish berry. If leaves are little longer (10 cm), dark green above and definitely elliptic with considerable soft hairs on underside of leaf and on young twigs, species probably - western dogwood (*C. occidentalis* (T & G.) Cov.). Munz (1974) considers western dogwood more common than American dogwood in southern California.

Distribution: Moist places, below 2700 m (9000 ft); willow and mixed conifer communities; Alaska to Mexico, occasionally in San Gabriel and San Bernardino Mountains (near Pine Knot Station, Big Bear, Lake Arrowhead).

Fire Response Mechanism: Sprouts readily from underground shoots.

Wildlife Value: Low value browse for mule deer, beaver. Not used by livestock. Fruit eaten by birds.

Cultural Value: Berries probably eaten (Clarke 1977); inner green cambium layers peeled, dried, and smoked in ceremony.

Cytisus monspessulanus L.

Pea Family (*Fabaceae*)

FRENCH BROOM (fig. 46). Shrub to 3 m tall, more or less



Figure 46-French broom, *Cytisus monspessulanus*.



Figure 47-Bush poppy (tree poppy), *Dendromecon rigida* (McMinn 1939).

drought deciduous, angled branches, young branches covered with mat of soft hairs; leaves compound, alternate, tend to be drought deciduous, 3-parted, crowded on stems, leaflets 0.8 to 2 cm long, 2 to 7 mm wide, petioles very short, leaflets tend to be obovate and nearly bald above and pubescent below; flowers, March to June, bright yellow, 1 to 2 cm long, more or less dense racemes; fruit, hairy pod to 2.5 cm long.

Distribution: Exotic from Canary Islands; planted along highways, naturalized near coast, mostly below 150 m (500 ft); Ventura and Los Angeles Counties, north to Washington.

Fire Response Mechanism: Unknown, probably resprouts.

Wildlife Value: Unknown.

Cultural Value: Introduced species.

Dendromecon rigida Benth. Poppy Family (*Papaveraceae*) BUSH POPPY (TREE POPPY) (fig. 47). Rounded evergreen shrub, 1 to 3 m, sometimes 6 m tall, young branchlets with whitish shredding bark becoming dark gray; leaves, somewhat rough, coriaceous feel, leaves alternate, thick and leathery, lanceolate, 2.5 to 10 cm long, 7 to 25 mm wide, minutely serrate to entire, vertical to axis of stems, somewhat glaucous gray to yellowish green and darker above; flowers, April to July, 2 to 5 cm across, yellow, showy with rounded petals, 2 to 3 cm long; fruit, linear pod 5 to 10 cm long

Distribution: Dry chaparral slopes below 1500 m (5000 ft); coast ranges, Sonoma County to Baja California, west base of Sierra Nevada.

Fire Response Mechanism: Stump-sprouts after fire.

Wildlife Value: Staple browse; seeds preferred by small birds, animals.

Cultural Value: Fruits, numb gums of teething babies.

Encelia californica Nutt. Sunflower Family (*Asteraceae*) CALIFORNIA ENCELIA (fig. 48). Rounded subshrub, more or less drought deciduous, 0.6 to 1.2 m tall, young stems densely pubescent to tomentose; leaves alternate, yellowish green darker above, ovate to lanceolate, some leaves may have irregular serrations on margins, surfaces with short hairs, tend to be 3-veined at or near base, veins becoming parallel with leaf margins, 2 to 7 cm long, 1.5 to 3.5 cm wide, petiole 5 to 20 mm long; flowers, February to July, solitary heads, yellow rays 1.5 to 3 cm long, purple center; fruit, akene. *Distribution*: Coastal bluffs, low hills below 600 m (2000 ft); coastal sage scrub (soft chaparral), chamise, etc.; Santa Barbara County to Baja California, inland to west Riverside and San Bernardino Counties.

Fire Response Mechanism: Variable root-sprouters after fire, cutting.

Wildlife Value: Low value.

Cultural Value: None known.

E. farinosa Gray.

BRITTLEBUSH (INCIENSO) (fig. 49). Roundish subshrub, 0.3 to 1.5 m tall, more or less drought deciduous, brittle stems arising from brown to gray linear furrowed, woody trunk,

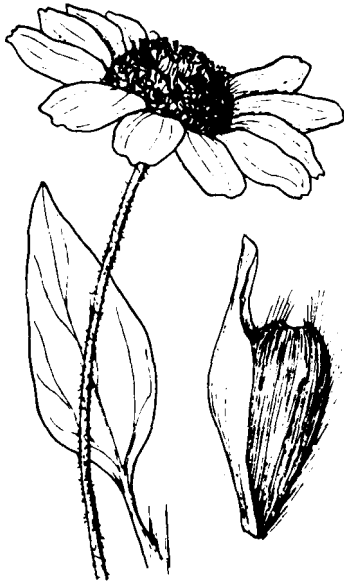


Figure 48-California encelia, *Encelia californica* (McMinn 1939).



Figure 49-Brittlebush (incienso), *Encelia farinosa* (McMinn 1939).

branches very leafy at ends, young stems may be tomentose; leaves broadly ovate to lanceolate, rounded or obtuse at apex, tapering to petiole at base, leaf entire or wavy margined, 3-veined from base, silvery-white and felty, 2 to 8 cm long, 1 to 4 cm wide, petiole very short, to 2 cm long; flowers, March to May, on yellowish green stalks protruding much beyond leaves, stalks branched, bear several sunflowers; heads 1 to 1.5 cm across (excluding rays), 4 to 7 mm high, rays showy, 8 to 12 mm long, yellow or orange, 8 to 18 in number falling early; fruit, akene.

Distribution: Inland counterpart of California encelia (*E. californica*) below about 1200 m (4000 ft), common in deserts and arid parts of western San Bernardino, Riverside, and San Diego Counties to Mexico.

Fire Response Mechanism: Poor root-sprouter. Seeds into available burned over areas.

Wildlife Value: Seeds eaten by birds, rodents.

Cultural Value: Exudate used as incense in churches in Baja California (McMinn 1939).

Ephedra spp. *Ephedra* Family (*Ephedraceae*)

1a. Leaf scales in twos; stems bright yellow green; shrub, western edge of deserts in pinyon juniper and creosote bush between 900 and 2300 m.

GREEN EPHEDRA, *E. viridis*

1b. Leaf scales in threes; stems green brown; desert shrub on dry slopes in creosote bush, sage scrub and grassland below 1100 m. MORMON-TEA, *E. californica*

E. californica Wats.

MORMON-TEA (*fig. 50*). Low, spreading or suberect shrub, 0.3 to 1 m tall, jointed semiflexible to rigid, straight branches, 3 to 4 mm thick, 3 to 6 cm long between green brown joints, branching at joints into several smaller branchlets 2 to 4 mm thick; leaf scales in threes at joints, mostly less than 6 mm long, about 2 mm wide at base narrowing to point, leaves overlapping to encompass stem; most leaves are on vegetative branchlets that arise from branches also with floral and fruiting branchlets, vegetative branchlets smaller (approximately one-half) than main branches, and elongated from overlapping leaves to several centimeters between leaves; flowers, February to May, dioecious; fruit, small cone, 6 to 10 mm long, 3 to 6 mm thick, somewhat 4-angled, abruptly pointed at apex, 1 to several at node. McMinn (1939) considered flowering and fruiting bodies to be in catkins; Munz (1974) calls them cones. They certainly appear to be more like small cones.

Distribution: Dry slopes and fans below 1100 m (3600 ft); creosotebush, sage scrub (soft chaparral), grassland; both deserts, San Diego County to Merced County, Baja California.

Fire Response Mechanism: Nonsprouter.

Wildlife Value: Used in emergency, not preferred by wildlife.

Cultural Value: Tea used by Native Americans and early settlers; tonic for kidney problems, purify blood, and for colds and stomach disorders. Dried stems ground or

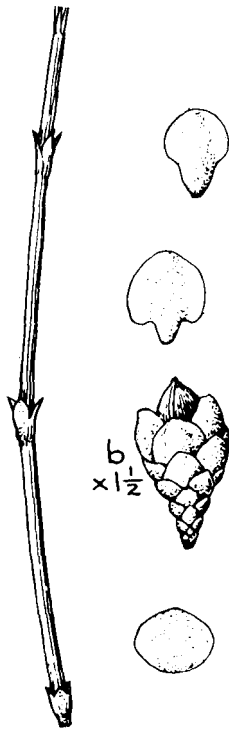


Figure 50-Mormon-tea, *Ephedra californica* (McMinn 1939).

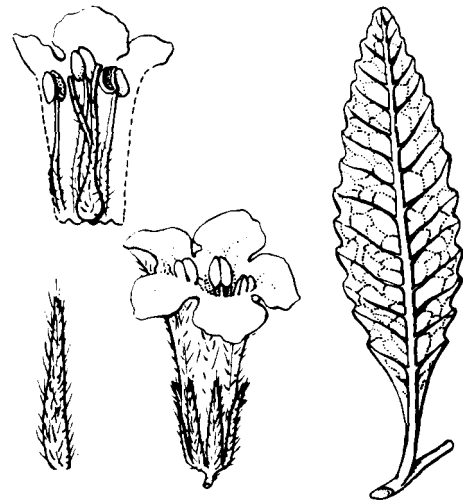


Figure 52-Thickleaf yerba santa, *Eriodictyon crassifolium* (McMinn 1939).

mixed with pinyon pine resin and used on open sores. Powder made into a poultice for burns (Balls 1972).

E. viridis Cov.

GREEN EPHEDRA (fig. 51). Erect shrub, 0.5 to 1.5 m tall, numerous broom-like yellow green branchlets 1 to 2 mm thick becoming thicker with gray shreddy bark, several branchlets arising from swollen nodes at 2 to 5 cm intervals; leaves on vegetative branchlets, opposite in twos, tips falling away from brown bases, leaves may be inverted at base, 3 to 10 mm long; flowers, March to May, dioecious; fruiting cones sometimes 1 or 3, usually 2 at a node, 5 to 8 mm long.

Distribution: Frequent on dry rocky slopes, canyons, 900 to 2300 m (3000-7500 ft); creosote to pinyon juniper; western edge of both deserts, western slope of Sierra Nevada to Mono and Lassen Counties, to Colorado, Utah, Arizona.

Fire Response Mechanism: Nonsprouter.

Wildlife Value: Seasonally important for bighorn sheep. New growth eaten in May, June, July. Used by livestock.

Cultural Value: Same as Mormon-tea (*E. californica*).

Eriodictyon crassifolium Benth.

(Hydrophyllaceae)

Waterleaf Family

THICKLEAF YERBA SANTA (fig. 52). Evergreen shrub, 1 to 3 m tall, twigs leafy toward upper ends, young stems grayish green becoming brown; leaves and twigs densely woolly; alternate clusters, leaves of several sizes

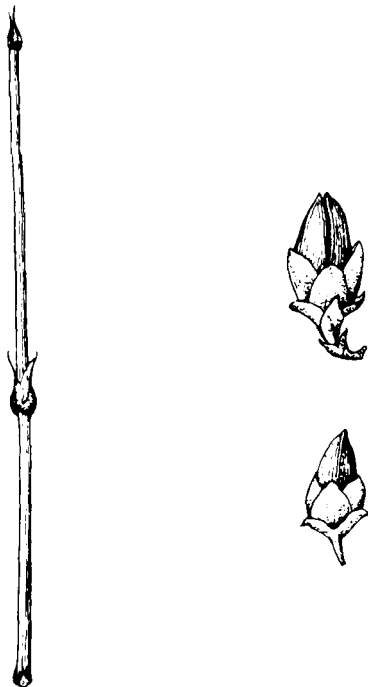


Figure 51-Green ephedra, *Ephedra viridis* (McMinn 1939).

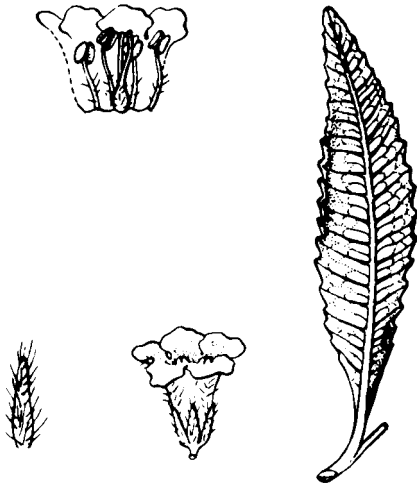


Figure 53-Yerba santa, *Eriodictyon trichocalyx* (McMinn 1939).

in many clusters lance-ovate to elliptic, 3 to 10 cm long, 1 to 3.5 cm wide, gray green, darker above, rounded serration on edges, short petioled; flowers, April to August, pale lavender, in scorpioid woolly raceme, funnel-shaped, 10 to 15 mm long; fruit, hairy capsule, 2 to 3 mm long. Var. *denudatum* Abrams. appears much like *E. trichocalyx*, but occurs in Santa Barbara and Ventura Counties. Trask Yerba Santa (*E. traskiae* Eastw.), common woolly species in Santa Ynez Range and north to San Luis Obispo County.

Distribution: Gravelly, rocky places, below 1800 m (6000 ft); manzanita, ceanothus, pinyon juniper, communities; Santa Monica, San Gabriel Mountains to western edge of Colorado Desert, San Jacinto, and Santa Rosa Mountains.

Fire Response Mechanism: Root-sprouts from lateral shoots after fire, cutting.

Wildlife Value: Low value.

Cultural Value: Leaves boiled into tea for cough, colds, sore throat, tuberculosis, rheumatism; liniment to reduce fever. Poultice of pounded fresh leaves bound to sores on people and animals (Balls 1972).

E. trichocalyx Heller.

YERBA SANTA (fig. 53). More or less aromatic, evergreen shrub, 0.5 to 2 m tall, very glutinous, resinous branchlets, some young stems may be hairy to woolly, angular, green becoming greenish brown then dark brown; leaves alternate with smaller leaves in leaf axils, lanceolate, tapering to both



Figure 54-California buckwheat, *Eriogonum fasciculatum* (McMinn 1939).

ends, 5 to 15 cm long, 1 to 3.5 cm wide, hairless, glutinous, darker above, grayish or gray green below prominently veined, margins dentate, sometimes slightly curled under at edges; flowers, May to August, dense, pale purple to white clusters, coiled like fiddle neck, 5 to 8 mm long, coils hairy-bristly; fruit, bristly capsule, 2 to 3 mm long.

Distribution: Dry slopes, fans, disturbed places, roadsides, below 2400 m (8000 ft); chaparral, yellow pine, pinyon-juniper, Joshua tree communities; Ventura County through San Gabriel, San Bernardino Mountains, east of Santa Rosa Mountains.

Fire Response Mechanism: Sprouts from lateral roots after fire, cutting.

Wildlife Value: Low value.

Cultural Value: Same as thick leaf Yerba Santa (*E. crassifolium*).

Eriogonum fasciculatum Benth.

Buckwheat Family (*Polygonaceae*)

CALIFORNIA BUCKWHEAT (fig. 54). Low spreading evergreen shrub to 1 m tall, branches flexible, bark reddish brown, thin and shredding; leaves simple, oblong-linear to lanceolate or oblanceolate, revolute, evergreen, alternate bundles (fascicles), 6 to 20 mm long, 2 to 5 mm wide, margins entire, green above, whitish below, somewhat pubescent above to nearly villous below; flowers, May to October, dense white or pinkish clusters, turn red brown with age; fruit, shiny akene about 2 mm long.



Figure 55-Seacliff buckwheat, *Eriogonum parvifolium* (McMinn 1939).

Distribution: Common on slopes, mesas; Santa Clara County south to Baja California; in many plant communities. Munz (1974) recognizes four subspecies in different plant communities from immediate coast to 2100 m (7000 ft).

Fire Response Mechanism: Seedling response to fire; non-sprouter or rarely from underground shoots.

Wildlife Value: Low value browse and seed.

Cultural Value: Green young shoots edible. Leaves boiled to make potion for headache and stomach ailments. White flowers steeped for use as eyewash (Sweet 1962).

E. parvifolium Smith

SEACLIFF BUCKWHEAT (fig. 55). Evergreen spreading shrub or branches lying on ground, 10 to 12 cm tall, bark becomes shreddy with age; leaves simple in alternate bundles, somewhat deltoid to orbicular or nearly obovate in outline, 5 to 15 mm long, 3 to 12 mm wide, petiole 2 to 4 mm long, green and hairless above, white and fuzzy below, margins rolled under at edges; flowers, May to December, tiny white dense clusters; fruit, akene to 2.5 mm long.

Distribution: Coastal bluffs below 150 m (500 ft); coastal scrub (soft chaparral); Monterey to San Diego County.

Fire Response Mechanism: Deep taproot and lateral roots spread to three times area of aboveground parts.

Wildlife Value: Low value except flowers for insects (bees); seeds for insects, birds, small animals.

Cultural Value: None known, probably same as California buckwheat (*E. fasciculatum*).

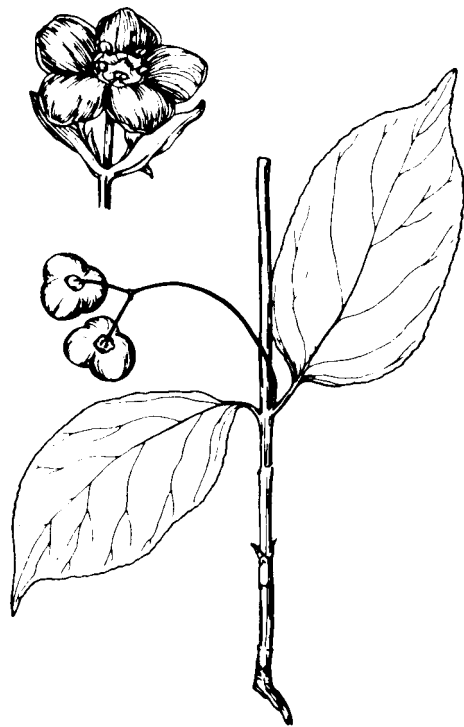


Figure 56-Burning bush, *Euonymus occidentalis* ssp. *parishii* (McMinn 1939).

Euonymus occidentalis Nutt. ssp. *parishii* (Trel.) Jeps.

Staff-tree Family (*Celastraceae*)

BURNING BUSH (fig. 56). Deciduous shrub or tree-like, 2 to 6 cm tall, straggling branches, bark gray or whitish; leaves thin and flexible, opposite, elliptic or ovate, rounded at apex, minutely serrate, darker above, 3 to 12.5 cm long, 2 to 6 cm wide, petiole 5 to 15 mm long; flowers, May to July, brownish purple with tiny dots, five petals, 1 to 7 clusters; fruit, capsule 4 to 7 mm across.

Distribution: Infrequent, moist canyon bottoms, 300 to 2000 m (1000-6500 ft); ponderosa and Jeffrey pine communities; San Jacinto Mountains, south to Palomar, Cuyamaca Mountains.

Fire Response Mechanism: Information not available.

Wildlife Value: Not significant.

Cultural Value: Unknown.

Eurotia lanata (Pursh) Moq.

Goosefoot Family (*Chenopodiaceae*)

WINTER FAT (fig. 57). This species recently renamed *Ceratoides lanata* (Pursh) Howell, *Eurotia* retained here to be in accord with Munz (1974). Erect or spreading, usually monoecious shrub, 0.3 to 0.8 m tall, hairy (lanate) on young stems and leaves, white or rusty star-shaped hairs intermingled with unbranched straight hairs; young twigs light brown to reddish brown become grayish with age; leaves alternate, sessile, commonly in fascicles (bundled) or often borne singly, linear



Figure 57-Winter fat, *Eurotia lanata* (McMinn 1939); renamed *Ceratoides lanata*.

or oblong, 1.5 to 5 cm long, 2 to 8 mm wide, fascicled leaves shorter, leaves mostly rust colored to most often dull green and more or less darker above; flowers, March to August, unisexual, female flowers have pair of bracts from which the two styles emerge; fruit, bladder-like sacs enclose seeds, two short horns above, strikingly dense spreading tufts of long silky rust-colored hairs.

Distribution: Flats and rocky mesas above 600 m (2000 ft); creosotebush to pinyon juniper woodlands; Lassen and Inyo Counties, Mojave Desert, eastern slope of inner Coast Range, San Bernardino Mountains, south to Mexico, east to Nebraska.

Fire Response Mechanism: Nonsprouter.

Wildlife Value: Staple browse for livestock, burros, etc.

Cultural Value: None known.

Fraxinus dipetala H. & A. Olive Family (*Oleaceae*)
FLOWERING ASH (FOOTHILL ASH) (fig. 58). Deciduous shrub or small tree, 2 to 7 m tall, erect, 4-angled branchlets with reddish brown to gray bark, young stems usually pubescent; leaves 4 to 12 cm long, divided into 3 to 9 leaflets, glabrous to somewhat pubescent, darker green above, oblong-ovate, serrate, 2 to 4 cm long, 0.5 to 2.5 cm wide; flowers, March and April, numerous blossoms with two white petals, 5 mm long in compound clusters; fruit, samara, 2 to 3 cm long, 7 to 9 mm wide, winged along sides, crowded clusters.

Distribution: Dry slopes and creek bottoms, below 1100 m (3500 ft); chaparral and riparian communities; Siskiyou

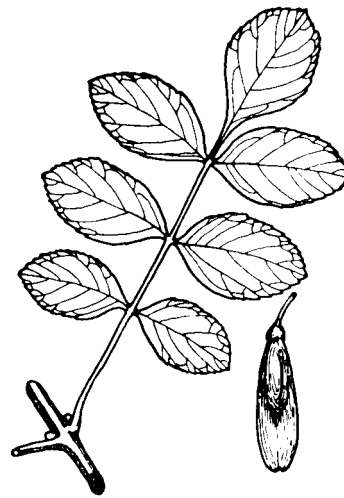


Figure 58-Flowering ash (foothill ash), *Fraxinus dipetala* (McMinn 1939).

County south, Sierra Nevada foothills from Shasta County, south to Los Angeles County, rare in San Diego County.

Fire Response: Mechanism: Stump-sprouts after fire, cutting.

Wildlife Value: Staple browse for deer.

Cultural Value: None known.

Fremontodendron californicum A. Davids.

Cacao Family (*Sterculiaceae*)

FLANNEL BUSH (fig. 59). Loosely branched shrub or small tree, 1.5 to 4 m, evergreen but somewhat drought deciduous; leaves usually palmate or round in outline to elliptic, elliptic-ovate, more or less 3-lobed, dark green above, pubescent above to densely pubescent yellowish below, leaves 1 to 2 cm long, 1 to 2 cm wide, petioles 1 to 5 cm long; flowers, April to July, bright yellow, showy, 2.5 to 4 cm broad; fruit, round bristly capsule 2.5 to 3.5 cm long.

Distribution: Granitic slopes, 900 to 1800 m (3000-6000 ft); ceanothus and manzanita to scrub oak chaparral, yellow pine, pinyon juniper communities; San Diego County north to Shasta and Kern Counties.

Fire Response Mechanism: Stump-sprouts after fire.

Wildlife Value: Staple browse for deer, livestock, goats.

Cultural Value: Inner bark used as demulcent for poultices to raw membranes (Sweet 1962).

Garrya veatchii Kell. Silktassel Family (*Garryaceae*)

SILKTASSEL (fig. 60). Erect evergreen dioecious shrub, 1 to 2 m tall, usually with white-woolly twigs, young stems green-

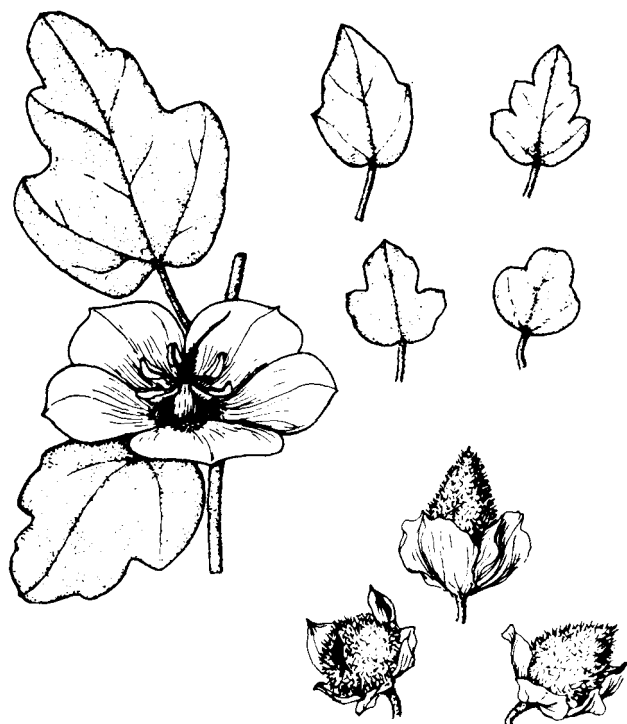


Figure 59-Flannel bush, *Fremontodendron californicum* (McMinn 1939).

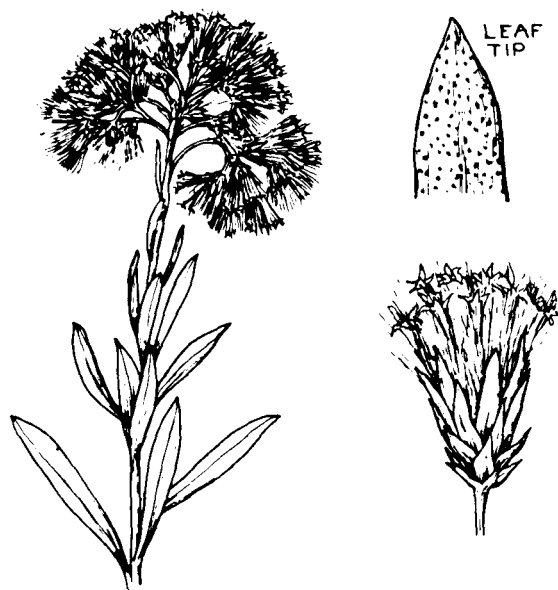


Figure 61-Goldenbush, *Haplopappus parishii* (McMinn 1939).



Figure 60-Silktassel, *Garrya veatchii* (McMinn 1939).

ish becoming dark brown; leaves simple, opposite, leathery, lanceolate to ovate, 2.5 to 6.5 cm long, 1.0 to 3.3 cm wide, petioles 4 to 10 mm long, leaves green and hairless to pubescent above, dense hairs give felty feeling beneath, plane or slightly wavy margined tending to roll downward; flowers, March through May, 2 to 4 dangling strings or "catkins" per cluster, staminate (male) clusters 5 to 10 cm long and pistillate (female) clusters 2.5 to 6 cm long; fruit, ovoid or rounded berry 7 to 8 mm across, buff to reddish brown and pubescent. *Distribution*: Dry slopes below 2100 m (7000 ft); manzanita, redshank and other chaparral communities; San Luis Obispo County south to Baja California, San Jacinto, San Bernardino (Cajon Pass), and San Gabriel Mountains.

Fire Response Mechanism: Stump-sprouts after fire, cutting.

Wildlife Value: Staple browse plant.

Cultural Value: Bark, leaves, and fruit contain the alkaloid garryine, used as tonic whose bitter taste gives rise to some species called quinine bush (McMinn 1939).

Haplopappus parishii (Greene) Blake.

Sunflower Family (*Asteraceae*)

GOLDENBUSH (fig. 61). Erect, branched shrub, 2 to 4 m tall, young stems green turning yellow at inflorescence to brown to gray below, branches hairless, resinous, with numerous glands; mature sessile leaves usually with shorter leaves in fascicle or bundle, alternate, simple, entire, more glandular than stems, linear to oblanceolate or elliptic, 2 to 6 cm long, 3 to 10 mm wide, flat, thick or leathery; flowers, July



Figure 62-Pine goldenbush, *Haplopappus pinifolius* (McMinn 1939).

through October, yellow, all tube flowers in compact clusters of several heads, each head 5+ mm high, subtended by four series of scale-like bracts; fruit, akene.

Distribution: Locally frequent on dry, south-facing slopes or outwash fans and other disturbance areas at 500 to 2100 m (1500-7000 ft); chaparral; San Gabriel, San Bernardino, San Jacinto, Santa Ana Mountains, through San Diego County to Baja California.

Fire Response Mechanism: Fire resistant foliage; nonsprouting, may set seed in first or second year following fire.

Wildlife Value: Low value.

Cultural Value: Unknown.

H. pinifolius Gray

PINE GOLDENBUSH (fig. 62). Shrub 0.5 to 2.5 m tall, main stem trunk-like; parallel erect branches, young stems yellowish green, resinous, often glandular-punctate, older branches becoming brown. Stems densely leafy, short and long leaves in a fascicle (bundle); leaves glandular pitted, linear to filiform, 1 to 4 cm long, about 1 mm wide, resinous, sticky, lemony smell; flowers, May through November, heads in dense or few-headed clusters, 5 to 10 or more yellow rays and many tube flowers; fruit, akene.

Distribution: Washes, dry slopes, 200 to 1600 m (500-5400 ft); sage scrub (soft chaparral), scrub oak, chamise chaparral; San Gabriel, San Bernardino, San Jacinto, and Laguna Mountains.

Fire Response Mechanism: Seedling response after fire.

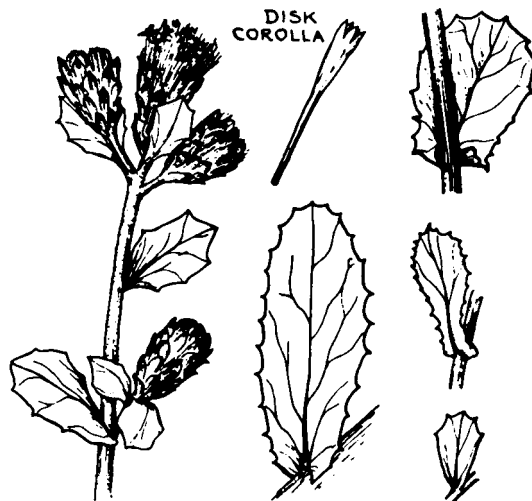


Figure 63-Sawtooth goldenbush, *Haplopappus squarrosus* (McMinn 1939).

Wildlife Value: Low value.

Cultural Value: Unknown.

H. squarrosus H. & A.

SAWTOOTH GOLDENBUSH (fig. 63). Low, erect subshrub, to 1 m tall, young stems light brown with persistent leaves, brown with age, bark becomes flaky; leaves, green, somewhat darker above, sharply serrated margins, somewhat rounded at tips, bases clasp slightly roughish pubescent stems, resinous, somewhat glandular oblanceolate to obovate, 1.5 to 4 cm long, 1 to 2 cm wide; flowers, September through October, yellow tube-flower heads with brownish-red hairs in spike-like raceme; fruit, akene. Subspecies *grindeloides* (DC.) Keck. most common representative in southern California.

Distribution: Common subshrub, open hills below 1400 m (4500 ft); coastal sage scrub (soft chaparral) chamise chaparral; Monterey and Santa Barbara Counties south to Baja California, and west San Bernardino County.

Fire Response Mechanism: Nonsprouter.

Wildlife Value: Low value.

Cultural Value: Unknown.

Heteromeles arbutifolia M. Roem. Rose Family (*Rosaceae*) **TOYON (CHRISTMASBERRY)** (fig. 64). Evergreen shrub or small tree, 2 to 10 m tall, freely branched, reddish to gray bark, young branchlets reddish green to green, sometimes pubescent; leaves elliptic-oblong, 3 to 11 cm long, 2 to 5 cm wide, petiole 1 to 2.5 cm long, leaves may have ligules, taper-



Figure 64-Toyon (Christmasberry) *Heteromeles arbutifolia* (McMinn 1939).

ing at both ends, rather sharply toothed margins, midvein prominent especially below, leathery, flat to somewhat convex, dark green above, lighter below, leaf surfaces sometimes pubescent; flowers, May through August, small white blooms, terminal clusters with five petals, 4 mm long; fruit, dry red berry 5 to 6 mm long, most prominent in December, present September through January.

Distribution: Brushy slopes, mostly below 1200 m (4000 ft); chaparral to live oak woodland; mountains of southern California to Humboldt, Shasta Counties.

Fire Response Mechanism: Vigorous crown- or stump-sprouter after fire, cutting.

Wildlife Value: Low value or staple browse; fruits preferred food of birds, small mammals.

Cultural Value: Berries cooked slightly to remove bitterness and eaten. Some Native Americans made a tea to cure aches and pains (Balls 1972). Channel Island fishermen used bark or tanning fish nets (Sweet 1962).

Holodiscus discolor (Pursh.) Maxim.

Rose Family (*Rosaceae*)

CREAMBUSH (fig. 65). Deciduous spreading shrub, 1.0 to m tall, young stems pubescent and brownish, become ashy gray with shreddy bark; leaves alternate, ovate in outline, dentate with 3 to 7 teeth each side, 4 to 9 cm long (rarely 2 to 3 long), 3 to 4 cm wide, petiole to 1 cm long, pubescent to villous above and villous-tomentose below, green, often with impressed veins on upper surface, lighter green to white-fuzzy, often with prominent veins below; flowers, June



Figure 65-Creambush, *Holodiscus discolor*.

through August, creamy white, dense branched clusters, 5-petaled, 2 mm long; fruit, akene.

Distribution: Moist woody slopes below 1400 m (4500 ft); Los Angeles and Orange Counties, north to British Columbia, and Rocky Mountains.

Fire Response Mechanism: Early successional after fire.

Wildlife Value: Low value browse for livestock, deer.

Cultural Value: Fruits edible.

Isomeris arborea Nutt. Caper Family (*Capparidaceae*)
BLADDERPOD (fig. 66). This species renamed *Cleome isomeris* Greene. *Isomeris arborea* retained to be consistent with Munz 1974. Erect, rounded evergreen shrub, 0.5 to 1.5 m tall, young branchlets pubescent, greenish becoming light brown to gray; leaves sometimes pubescent above and below, gray green, 3-parted or simple below flowers; leaflets oblong or lance shaped, 1 to 4.5 cm long, 3 to 10 mm wide, ill-scented when crushed; flowers, February through May, yellow blossoms, two lower petals more spreading than two upper; fruit, inflated pod, 2.5 to 5 cm long, 1 to 1.5 cm thick.

Distribution: Desert and coastal bluffs and dunes, subsaline places 1200 m (4000 ft); coastal sage scrub (soft chaparral), creosotebush, etc.; near coast, San Diego to Santa Barbara Counties (Monterey), south to Mexico; species also found in Mojave and Colorado Deserts.

Fire Response Mechanism: Nonsprouter.

Wildlife Value: Low value.

Cultural Value: Green pods edible and spicy.



Figure 66-Bladderpod, *Isomeris arborea* (McMinn 1939); renamed *Cleome isomeris*.

Juglans californica Wats. Walnut Family (*Juglandaceae*)
CALIFORNIA BLACK WALNUT (fig. 67). Small monoecious, deciduous tree or large shrub, usually with several trunks from or near the ground, 3 to 10 m tall, young stems brownish, pubescent becoming dark brown to gray; leaves alternate, pinnate-compound, 15 to 25 cm long, 9 to 19 elliptic to oblong or lanceolate leaflets, base of each somewhat wedge-shaped or rounded, serrated, 3.0 to 7.5 cm (sometimes 11 cm) long, 1 to 3 cm (sometimes 5.5 cm) wide; flowers, March through May, male flowers in catkins 5 to 8 cm long, arise from 1-year-old twigs, female flowers on peduncles arise from end of current year twigs; fruit, walnut enclosed in dark brown husk.

Distribution: Locally common in oak woodlands below 1400 m (4500 ft); Santa Barbara to Orange Counties, to west San Bernardino County.

Fire Response Mechanism: Stump sprouts after fire, cutting.

Wildlife Value: Staple browse for mule deer; fruits preferred by squirrels.

Cultural Value: Nuts edible. Clarke (1977) indicates Cahuilla Indians used hulls for dye in basket making.

Juniperus spp. Cypress Family (*Cupressaceae*)

1a. Leaves with glandular pits on the back; shrub or small tree in pinyon-juniper and Joshua tree communities below 1500 m on desert slopes.

CALIFORNIA JUNIPER, *J. californica*

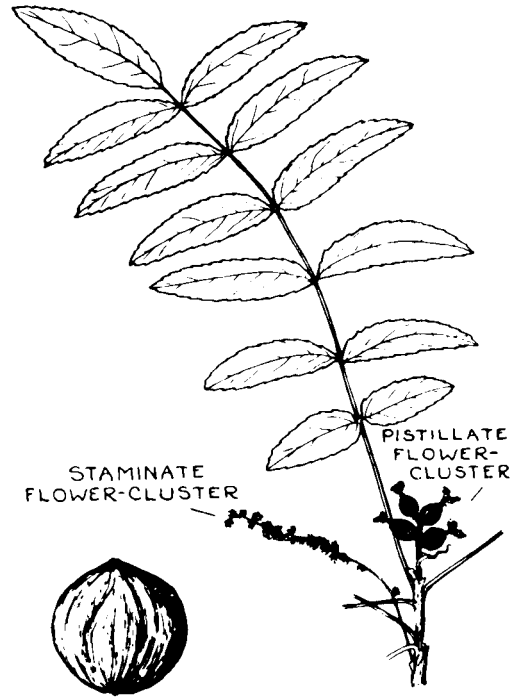


Figure 67-California black walnut, *Juglans californica* (McMinn 1939)

1b. Leaves without glandular pits; shrub or small tree on dry desert mountains and flats, east Mojave Desert between 1500 and 2600 m. **UTAH JUNIPER**, *J. osteosperma*

J. californica Carr.

CALIFORNIA JUNIPER (fig. 68). Shrub or small tree, usually dioecious, much branched, several codominant main branches from base, 1 to 4 m tall, young stems green becoming brown as with Utah juniper (*J. osteosperma*), bark ashy grey or reddish, shreddy; leaves scale-like, usually in whorls of three around branchlet, sometimes in twos opposite, 2 to 4 mm long, bluntly pointed at apex, usually with conspicuous glandular-pitting on back; male cones minute in leaf axils; fruit, berry-like cone, bluish white, turn red brown, oblong-ovoid, 12 to 18 mm long.

Distribution: Dry slopes, flats below 1500 m (5000 ft); pinyon-juniper, Joshua tree communities; desert slopes, Colorado Desert north to Kern, Santa Barbara, and Los Angeles Counties.

Fire Response Mechanism: Nonsprouter.

Wildlife Value: Low value browse, fruits.

Cultural Value: See Utah juniper (*J. osteosperma*).

J. osteosperma (Torr.) Little

UTAH JUNIPER, (fig. 69). Large evergreen shrub or small tree, usually dioecious, 1 to 2 m tall, bushy habit; young stems with leaf scales become brown with age as leaf scales drop; bark grayish, flaky small barbs at branchlet scars; leaves mostly opposite in scale-like pairs, sometimes in whorls of

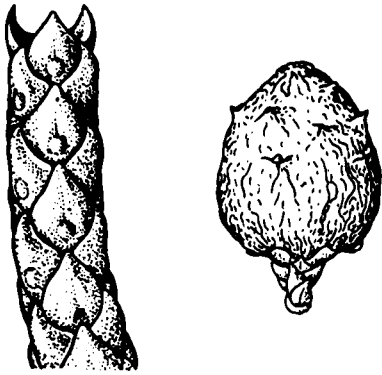


Figure 68-California juniper, *Juniperus californica*.

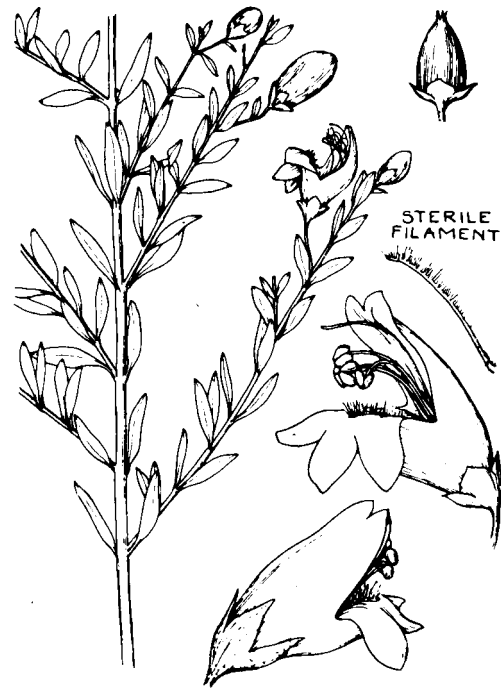


Figure 70-Bush penstemon, *Keckiella antirrhinoides* (McMinn 1939).

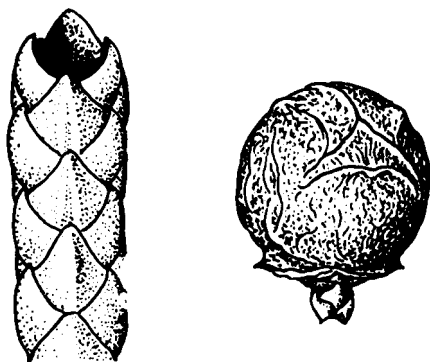


Figure 69-Utah juniper, *Juniperus osteosperma*.

three, 2 to 4 mm long, without glands; male cones, minute in leaf axils; fruit, round berry-like cone, 6 to 9 mm diameter, reddish brown under white film.

Distribution: Dry slopes, flats 1500 to 2600 m (4800-8500 ft); pinyon juniper; mountains of east Mojave Desert, to Mono County, southwest Idaho. Also on east-facing desert slopes of San Bernardino Mountains.

Fire Response Mechanism: Nonsprouter.

Wildlife Value: Low value browse, fruit.

Cultural Value: Berries eaten fresh or sun-dried and ground into flour and made into beverage. Bark used as medicine and red dye made from ashes (Clarke 1977).

Keckiella antirrhinoides (Benth.) Straw

Figwort Family (*Scrophulariaceae*)

BUSH PENSTEMON (fig. 70). Evergreen shrub 1 to 2.5 m tall, spreading, much-branched stems; leaves opposite, entire, linear- to ovate-elliptic, 0.5 to 2 cm long, 2 to 7 mm wide, firm, crowded, leaf surfaces glabrous to somewhat pubescent; flowers, April through June, yellow blooms tinged with brownish red, 16 to 20 mm long, irregularly lobed, snap-dragon-like; fruit, capsule containing many seeds.

Distribution: Dry rocky slopes, below 1400 m (4500 ft); coastal sage scrub (soft chaparral); San Bernardino, Santa Barbara Counties, south Baja California.

Fire Response Mechanism: Information not available.

Wildlife Value: Low value.



Figure 71-Straggly penstemon, *Keckiella cordifolius* (McMinn 1939)

Cultural Value: Bush penstemon (*Keckiella* spp.) probably used like penstemon (*Penstemon* spp.) as wash and poultice for running sores and burns and for floral decorations and ceremonies (Sweet 1962).

K. cordifolius (Benth.) Straw

STRAGGLY PENSTEMON (fig. 71). Sprawling shrub, 1 to 3 m tall, commonly with scrambling, long, straggly brown stems, or bushy; leaves opposite, at least some leaves with serrated margins dark green, shiny, glabrous to pubescent, lighter below, ovate or roundish, cordate (heart-shaped base) with prominent veins below, 1.5 to 5 cm long, 1 to 3 cm wide; flowers, May through July, red or scarlet, 30 to 40 mm long, tubular, terminal racemes; fruit, many-seeded capsule.

Distribution: Dry slopes, below 1200 m (4000 ft) in live oak woodlands, manzanita and chamise chaparral; San Luis Obispo County, south to San Gabriel, San Bernardino, San Jacinto Mountains, to Baja California.

Fire Response Mechanism: Stump-sprouts.

Wildlife Value: Low value.

Cultural Value: See bush penstemon (*K. antirrhinoides*).

K. ternata (Torr.) Straw

WHORL-LEAF PENSTEMON (fig. 72). Straggly evergreen subshrub, 0.5 to 1.5 m tall, rather straight wand-like stems from woody base, white-filmy; bluntly serrated leaves in whorls of three, occasionally two, lance-shaped or somewhat linear, often folded upwards along midvein, 2 to 5 cm long, 2 to 11 mm wide; flowers, June to September, scarlet



Figure 72-Whorl-leaf penstemon, *Keckiella ternata* (McMinn 1939).

blooms, 23 to 30 mm long, tubular; fruit, many-seeded capsule.

Distribution: Dry slopes below 1800 m (6000 ft); ponderosa and Jeffrey pine woodlands, black oak woodlands, manzanita chaparral; San Gabriel, San Bernardino Mountains, to San Diego County.

Fire Response Mechanism: Stump-sprouts after fire.

Wildlife Value: Low value browse.

Cultural Value: See bush penstemon (*K. antirrhinoides*).

Lepechinia calycina (Benth.) Epl. Mint Family (*Lamiaceae*)

PITCHER-SAGE (fig. 73). Erect, small subshrub, to 12 cm tall, considerable stem pubescence (sometimes woolly), at least young stems square; leaves simple, opposite, aromatic, more or less prominent veins, 4 to 12 cm long, 2 to 3 cm wide, petioles 5 to 20 mm long, leaves usually approximately lanceolate to obtuse or oblong, glabrous or scattered pubescence above, more or less hairy or pubescent below; flowers, April through August, 2.5 to 3 cm long, white to pink with purple spots, somewhat prominent veins; fruit, ellipsoid nutlet about 3.5 mm long.

Distribution: Chaparral and woodlands on exposed slopes, below 900 m (3000 ft); Lake County south to Ventura County, *L. fragrans* (Greene) Epl. (leaves tomentose) occasional in Santa Monica, San Gabriel Mountains, Los Angeles County, *L. ganderi* Epl. occurs in San Diego County and looks much like *L. calycina*.

Fire Response Mechanism: Root-sprouts after fire, cutting.

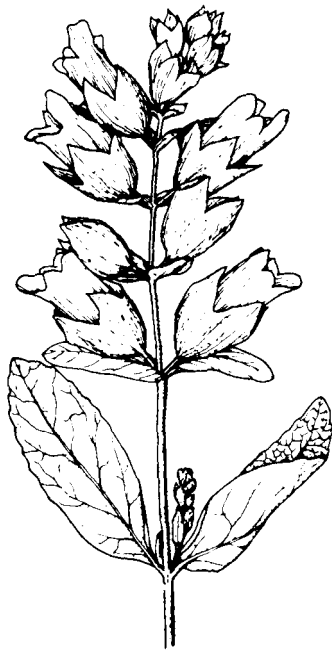


Figure 73-Pitcher-sage, *Lepechinia calycina* (McMinn 1939).

Wildlife Value: Low value.

Cultural Value: None known.

Lepidospartum squamatum (Gray) Gray

Sunflower Family (*Asteraceae*)

SCALEBROOM (fig. 74). Broom-like shrub, 1 to 2 m tall; except for spring shoots, stems and branches usually hairless, green becoming light brown to gray with age; leaves acute, ovate, alternate scales 1 to 2 mm long, sometimes a small tomentose appendage in leaf axils, spring growth may be quite different, including larger leaves (7 to 15 mm long, 2 to 8 mm wide) with fuzzy to tomentose leaf surfaces; flowers, June through December, heads numerous, terminating short lateral branches, bracts of heads papery, overlapping like shingles, flower heads dull white to yellow; fruit, akene.

Distribution: Common in washes, gravelly places, below 1200 m (4000 ft); coastal sage scrub (soft chaparral), chaparral, Joshua tree woodland; Santa Clara, Tulare Counties, south to deserts, and Baja California.

Fire Response Mechanism: Unknown.

Wildlife Value: Low value.

Cultural Value: None known.

Lonicera spp. Honeysuckle Family (*Caprifoliaceae*)

1a. Leaves often joined together in a whorl near branch tips, especially just below flowers or fruits; vine-like shrub, dry slopes between 300 and 1800 m in chaparral, yellow



Figure 74-Scalebroom, *Lepidospartum squamatum*.

pine. **CHAPARRAL HONEYSUCKLE**, *L. interrupta*

1b. Leaves all separate to branch tips; vine-like shrub in chaparral below 900 m in Santa Barbara region.

SANTA BARBARA HONEYSUCKLE, *L. subspicata*

L. interrupta Benth.

CHAPARRAL HONEYSUCKLE (fig. 75). Evergreen bushy vine-like shrub with branches leaning on and growing over other vegetation; branchlets often purplish becoming brown with stringy bark, filmy covered, and hairless; leaves opposite, entire, roundish to elliptic, 1.5 to 7.0 cm long, 1.5 to 5.0 cm wide, green above, white-filmy below, thick and somewhat leathery, uppermost pair often joined at base, forming apparently single leaf through which stem passes; flowers, May to July, whorls of terminal clusters, 3 to 16 cm long, yellowish corolla, funnel-shaped, 10 to 14 mm long; fruit, red berry 5 mm diameter.

Distribution: Dry slopes 300 to 1800 m (1000-6000 ft); chaparral to yellow pine forests; north coast ranges to San Bernardino Mountains. California Honeysuckle (*L. hispidula* Dougl.) with pink purple flowers and glandular-hairy flower stalks also occur with this species.

Fire Response Mechanism: Probably nonsprouter or poor sprouter.

Wildlife Value: Low to moderate value for deer and birds, some use by bees.



Figure 75-Chaparral honeysuckle, *Lonicera interrupta* (McMinn 1939).



Figure 77-Deerweed, *Lotus scoparius* (McMinn 1939).

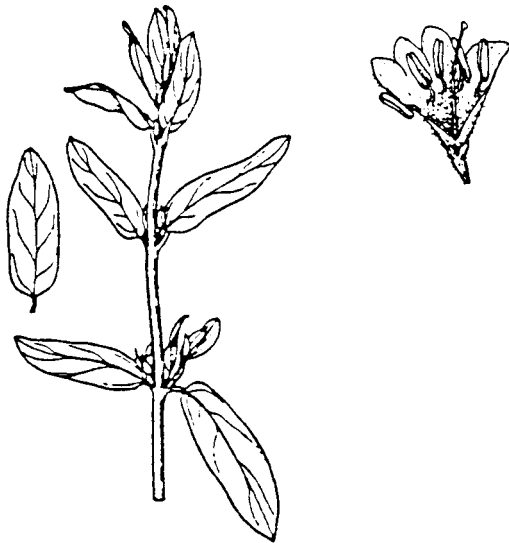


Figure 76-Santa Barbara honeysuckle, *Lonicera subspicata* (McMinn 1939).

Cultural Value: Medsger (1966) reported twinberry (*L. involucrata* [Richards.] Banks) berries eaten by Native Americans, no mention made of chaparral honeysuckle or Santa Barbara honeysuckle.

L. subspicata H. & A.

SANTA BARBARA HONEYSUCKLE (fig. 76). Clambering, evergreen, vine-like shrub, 1 to 2.5 m tall, thin shredded brown gray bark on older branches; leaves, 1 to 3.5 cm long, 0.5 to 2.5 cm wide; petiole 3 to 4 mm long, narrowly elliptical or linear to oblanceolate, leathery, darker green and hairless above, lighter below and usually pubescent white, fuzzy below; leaf margins may be rolled downward and somewhat serrate; flowers, June to July, pale yellow; fruit, yellowish or red ellipsoid berry, 5 to 7 mm long.

Distribution: In chaparral, mostly below 900 m (3000 ft); Santa Barbara region. Var. *johnstonii* Keck. with somewhat broader leaves grows at higher elevation, to 1500 m (5000 ft).

Fire Response Mechanism: Early postfire successional; nonsprouter.

Wildlife Value: Preferred browse for deer, livestock, goats, especially after burns.

Cultural Value: See chaparral honeysuckle (*L. interrupta*).

Lotus scoparius (Nutt.) Ottley Pea Family (*Fabaceae*)
DEERWEED (fig. 77). Spreading, more or less drought deciduous subshrub 0.5 to 1.2 m tall, long slender green branches become brown with age; leaves 3-foliate with gland-

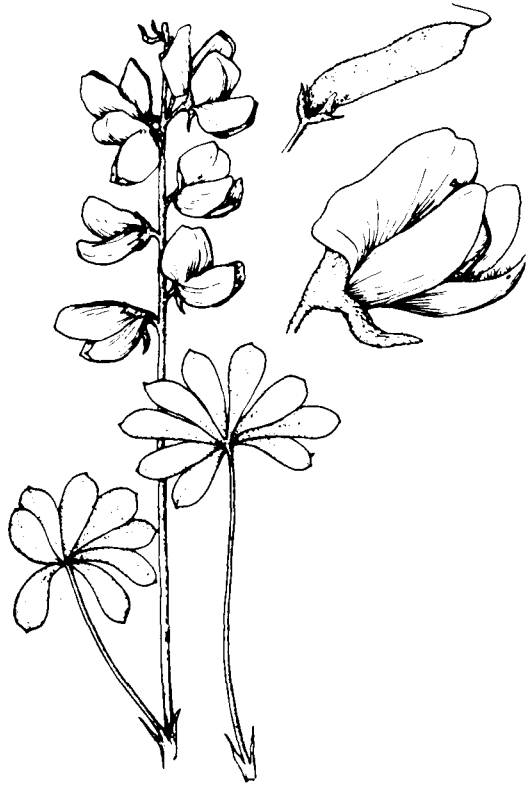


Figure 78-Silver lupine, *Lupinus albifrons* (McMinn 1939).

like stipules at base of leaf, leaflets entire, lance- to oblanceolate-shaped, 3 to 10 mm (sometimes to 15 mm) long, 1 to 4 mm wide; flowers, January through May, 1- to 5-flowered clusters in leaf axils, 7 to 10 mm long, yellow or tinged with red; fruit, slightly curved pod.

Distribution: Common on dry slopes, below 1500 m (5000 ft); coastal sage scrub (soft chaparral) and chaparral; Baja California to northern California.

Fire Response Mechanism: Seedling response to fire; non-sprouter.

Wildlife Value: Staple to low value browse for deer, livestock.

Cultural Value: None known.

Lupinus albifrons Esch Pea Family (*Fabaceae*)
SILVER LUPINE (fig. 78). Rounded shrub, to 1.5 m tall, yellowish green pubescent stems becoming brownish to gray with flaky bark and silky-silver foliage; leaves compound, alternate, olive green divided into 7 to 10 palmate leaflets, silky on both surfaces, leaflets 1 to 3 cm long, 3 to 10 mm wide, petioles 2 to 4 cm long; flowers, March to July, blue or purple, upper petal with light center; fruit, pubescent pod 3 to 5 cm long.

Distribution: Common on dry hillsides, sandy places below 1500 m (5000 ft); in many plant communities; Ventura County north to Humboldt County. Pauma lupine (*L. longifolius* [Wats.] Abrams.) similar species, has more herbaceous growth with somewhat longer petioles (4 to 7 cm long), leaflets (3 to 6 cm), confined to lower elevations inland from

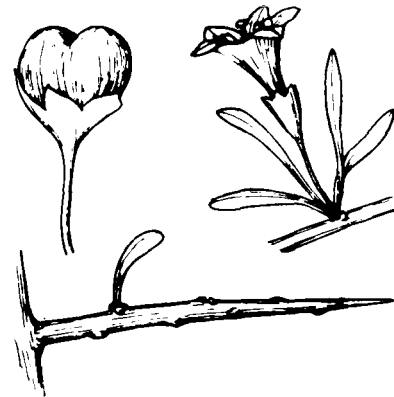


Figure 79-Box-thorn, *Lycium californicum* (McMinn 1939).

coast to Santa Ana Mountains. Inyo lupine (*L. excubitus* Jones var. *johnstonii* C. P. Sm.) found in pine woodlands, San Gabriel Mountains, 1700 to 2000 m (5500-6600 ft), longer petioles (4 to 10 cm), usually larger leaves (leaflets 2 to 4 cm long); stems woody at base. Along coastal strand in Santa Barbara County, look for tree lupine (*L. arboreus* Sims.) with yellow flowers. Dune lupine (*L. chamissonis* Eschs.) is another coastal species with silky leaves.

Fire Response Mechanism: Important early invader following fire, lasts 3 to 4 years, later only as an occasional plant, coastal species useful for dune reclamation; nonsprouter.

Wildlife Value: Low value except for insects, especially bees, small animals.

Cultural Value: Though seeds of some species contain poisonous alkaloids, Native Americans made medicinal tea from seeds especially to help urination (Sweet 1962).

Lycium californicum Nutt. Nightshade Family (*Solanaceae*)
BOX-THORN (fig. 79). Compact appearing, intricately branched and densely spiny shrub with numerous small twigs ending in spines, 1 to 2 m tall; leaves somewhat drought deciduous, grayish green above and below, 1 to 3 in a bundle, fleshy and succulent, hairless, spatulate to linear, 3 to 12 mm long, 1 to 3 mm wide; flowers, much of year, solitary, white or purplish, somewhat trumpet-shaped, 2 to 4 lobes; fruit, firm, ovoid (2 mm across), reddish 2-seeded berry.

Distribution: Near coast mostly below 110 m (360 ft); coastal sagebrush in coastal sage scrub (soft chaparral); Los Angeles County, south to Baja California.

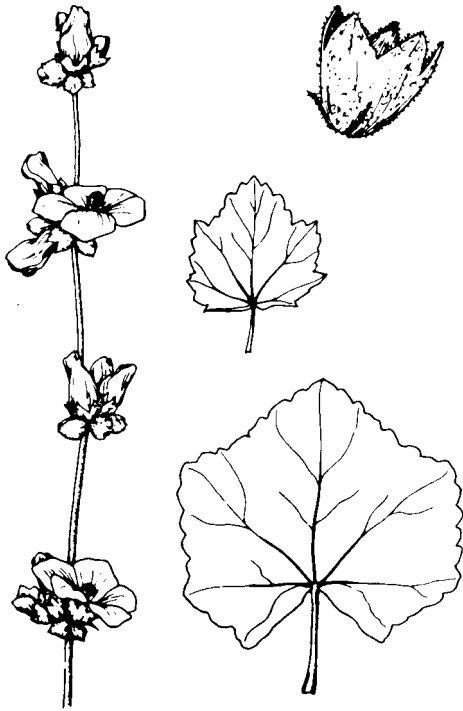


Figure 80-Bush mallow, *Malacothamnus fasciculatus* (McMinn 1939).

Fire Response Mechanism: Unknown.

Wildlife Value: Staple fruit for doves, quail, small mammals.

Cultural Value: Edible fruits.

Malacothamnus fasciculatus (Nutt.) Greene

Mallow Family (*Malvaceae*)

BUSH MALLOW (fig. 80). Tall, somewhat drought deciduous shrub, 1 to 5 m, long slender wand-like branches covered with short, soft yellowish fuzz, young stems cream-colored becoming gray brown; leaves with yellowish fuzz, round-ovate to deltoid in outline, often presenting an upside-down heart shape, barely to deeply 3- to 5-lobed, with rounded serrations, 2 to 5 cm wide, petioles 0.5 to 1 cm long; flowers, April through December, pink clustered blooms attached directly to stems; flowers on branched stalks indicate *M. fasciculatus* var. *laxiflorus* (Gray) Kear.; petals 12 to 18 mm long.

Distribution: Dry canyon sides, slopes, below 800 m (2500 ft) or up to 1700 m (5500 ft) for variety in coastal sage scrub (soft chaparral); Santa Barbara, Orange, north Riverside Counties to San Bernardino County, Cajon Pass.

Fire Response Mechanism: Early successional; seedling response to fire.

Wildlife Value: Low value or staple browse for livestock, deer.

Cultural Value: None known.



Figure 81-Monkeyflower, *Mimulus longiflorus* (inset, McMinn 1939); renamed *Diplacus longiflorus*.

Mimulus longiflorus Nutt.

Figwort Family (*Scrophulariaceae*)

MONKEYFLOWER (fig. 81). This species renamed *Diplacus longiflorus* Nutt. *Mimulus longiflorus* retained to be consistent with Munz 1974. Diffusely branched, largely wood subshrub 0.3 to 1.2 m tall. Upper stems and branches, under side of leaves, and pedicels hairy. Yellowish green leaves, upper side with impressed veins, leaves lighter below, lanceolate to oblong, may be serrate, 2.5 to 8 cm long, 5 to 20 mm wide; flowers, February through August, orange to buff, 5 to 6 cm long; fruit, capsule.

Distribution: Common on dry rocky slopes to 1500 m (5000 ft); coastal sage scrub (soft chaparral); chaparral, San Diego to San Luis Obispo Counties, inland to San Jacinto Mountains and Kern River area.

Fire Response Mechanism: Probably poor sprouter or nonsprouter.

Wildlife Value: Low to moderate value.

Cultural Value: Sweet (1962) reports leaves and young stems of some species used by Native Americans for food and as poultice for sores.

Myrica californica C. & S.

Wax-Myrtle Family (*Myricaceae*)

PACIFIC WAX-MYRTLE (fig. 82). Large monoecious, evergreen shrub, 2 to 4 m tall, smooth gray or light brown bark; leaves simple, alternate, elliptic to approximately oblanceolate, glossy and dark green above, paler below, hair-

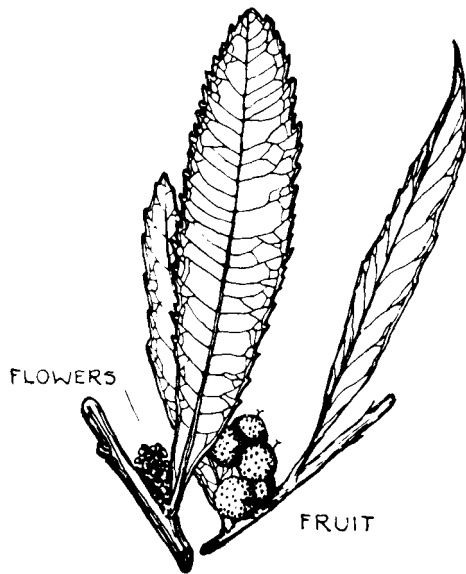


Figure 82-Pacific wax-myrtle, *Myrica californica* (McMinn 1939).

less, 5 to 11 cm long, 1.2 to 2 cm wide, petiole short or missing, slightly serrate or with smooth margins; flowers, March to May, male catkins in leaf axils below female catkins; fruit, round brownish-purple nut covered with whitish wax, 3 to 8 mm diameter, borne at base of leaves.

Distribution: Moist places; coastal sage scrub (soft chaparral); chaparral, woodlands, below 150 m (500 ft); Santa Monica Mountains, north along coast to Washington.

Fire Response Mechanism: Sprouts from root shoots, suckers after fire, cutting.

Wildlife Value: Low value browse; fruits used by California quail.

Cultural Value: None known.

Nicotiana glauca Grah. Nightshade Family (*Solanaceae*) TREE TOBACCO (fig. 83). More or less drought deciduous, tall, loosely branched shrub or small tree, 2 to 8 m tall, white filmy glaucous, green stems and glaucous leaves, easily brush green at touch; leaves ovate or elliptic to almost lanceolate, entire, 3 to 17 cm long, 1.5 to 3.5 cm wide, petiole 3 to 5 cm long; flowers much of year, especially April through September, 3 to 4 cm long, yellow and tubular; fruit, 4-valved ovoid capsule, 10 to 12 mm long.

Distribution: Common, naturalized from South America in waste places, below 900 m (3000 ft).

Fire Response Mechanism: Nonsprouter.

Wildlife Value: Toxic to livestock, rarely browsed.



Figure 83-Tree tobacco, *Nicotiana glauca* (McMinn 1939).

Cultural Value: According to legend, tobacco was one of first plants created by the god Mukat. Leaves used for smoking. Leaves, stems and seeds used for medicinal purposes (Sweet 1962).

Pickeringia montana Nutt. Pea Family (*Fabaceae*) CHAPARRAL-PEA (fig. 84). Evergreen shrub, 0.5 to 2 m tall, densely branched, spine-tipped branchlets, greenish or grayish becoming reddish to gray; leaves alternate, compound, 3-parted or some solitary, green, mostly glabrous or pubescent, leaflets entire, obovate, firm 4 to 12 mm long, 3 to 5 mm wide, attached directly to stems; flowers, May to June, rose to purple, five irregular petals with yellowish spot near base of upper petal; fruit, pod 3 to 5 cm long, constricted between seeds. San Bernardino and eastern San Diego Counties variant have pubescent to canescent leaves and young twigs (Munz 1974).

Distribution: Dry slopes, ridges below 1500 m (5000 ft); manzanita to live woodlands; Sierra Nevadas, Butte County, south to San Diego County.

Fire Response Mechanism: Sprouts from exposed roots, root shoots.

Wildlife Value: Low value.

Cultural Value: None known.

Prunus spp. Rose Family (*Rosaceae*)
1a. Plants evergreen; leathery, holly-like leaves; shrub or small tree on dry foothills in chaparral to live oak wood-



Figure 84-Chaparral-pea, *Pickeringia montana* (McMinn 1939).

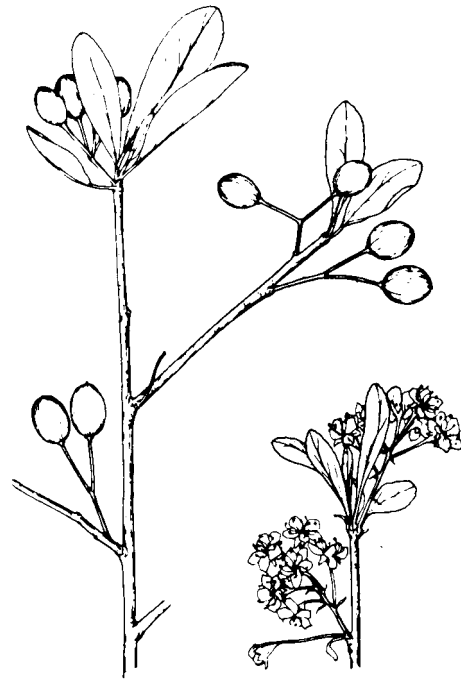


Figure 85-Bitter cherry, *Prunus emarginata* (McMinn 1939).

lands below 1500 m.

HOLLYLEAF CHERRY, *P. ilicifolia*

- 1b. Plants deciduous; not with leathery leaves.
- 2a. Shrubby, with spine-tipped branchlets; shrub on desert slopes in creosote bush, Joshua tree, pinyon-juniper between 970 and 1800 m.

DESERT ALMOND, *P. fasciculata*

- 2b. Shrubby or small trees, not spiny.
- 3a. Leaves 1 to 2.5 cm wide; petioles short, 5 mm long; shrub or tree on moist chaparral to pine woodland slopes below 2700 m.

BITTER CHERRY, *P. emarginata*

- 3b. Leaves 2 to 5 cm wide; petioles 1 to 2 cm long; shrub or tree on moist slopes in chaparral to oak and pine woodlands below 2500 m.

WESTERN CHOKE CHERRY

P. virginiana ssp. *demissa*

P. emarginata (Dougl.) Walp.

BITTER CHERRY (fig. 85). Deciduous shrub or tree, 1 to 6 m tall, hairless red twigs, older bark smooth; leaves simple, alternate, grouped or somewhat bundled, spatulate to ovate, rounded at apex, 2 to 5 cm long, 1 to 2 cm wide, petiole less than 1 cm long, light green both sides, smooth surface, possible slightly pubescent especially below, minutely serrate; flowers, April and May, 1.5 to 4 cm long, five white petals, 5 to 7 mm long, clusters of 3 to 10; fruit, red bitter drupe 6 to 8

mm diameter, turning black at maturity, stone pointed at ends.

Distribution: Moist slopes, stream banks, below 2700 m (9000 ft); yellow pine woodlands, manzanita and other chaparral communities; southern California, coast ranges, Sierra Nevada, to British Columbia, Nevada, Arizona.

Fire Response Mechanism: Stump-sprouts after fire, cutting.

Wildlife Value: Preferred browse of deer; fruits staple for birds.

Cultural Value: Fruits used, but bitter.

P. fasciculata (Torr.) Gray

DESERT ALMOND (fig. 86). Rigidly much-branched deciduous shrub, 1 to 3 m tall, with short, stiff, thorn-like twigs, brownish branchlets becoming gray; leaves simple, alternate, bundles of 3 to 7 or more, spatulate to oblance-spatulate usually widest near end, 5 to 15 mm long, 2 to 4 mm wide, pale green above and below, slightly pubescent to glabrous; flowers, April and May, single or few-flowered clusters, five white petals, 2 to 3 mm long; fruit, dry ovoid drupe 8 to 12 mm long, pubescent with light brown hairs and smooth stone.

Distribution: Desert slopes, mostly 970 to 1800 m (3200-6000 ft); creosote bush, Joshua tree to pinyon juniper woodlands; Mojave and Colorado Deserts, Arizona, Utah.

Fire Response Mechanism: Root-sprouts after fire, cutting.

Wildlife Value: Low value browse.

Cultural Value: Fruits eaten, not preferred.



Figure 86-Desert almond, *Prunus fasciculata* (McMinn 1939).

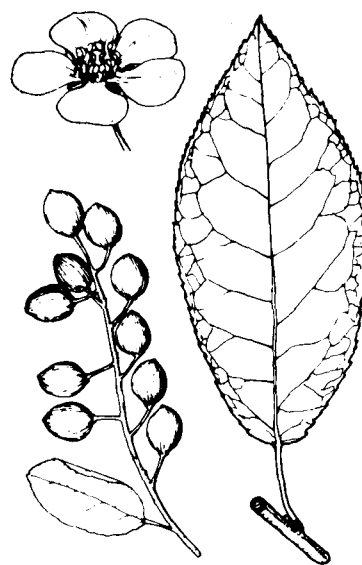


Figure 88-Western choke cherry, *Prunus virginiana* var. *demissa* (McMinn 1939).

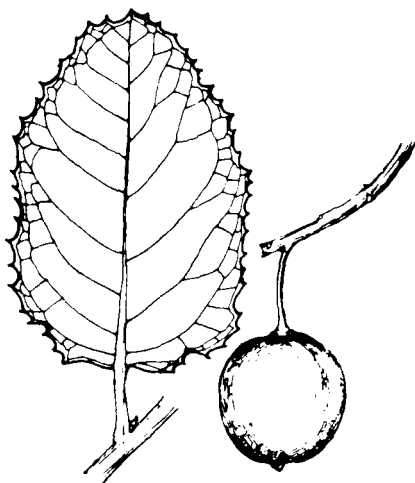


Figure 87-Hollyleaf cherry, *Prunus ilicifolia* (McMinn 1939).

P. ilicifolia (Nutt.) Walp.

HOLLYLEAF CHERRY (fig. 87). Evergreen shrub or small tree, 1 to 8 m tall, twigs gray or reddish brown; leaves simple, alternate, thick, leathery, 2 to 7 cm long, 2 to 4 cm wide, petiole 0.5 to 1.5 cm long, mature leaves generally with coarse spiny-toothed margins, ovate to oval, dark green, shiny above, paler below; flowers, April and May, 3 to 10 cm long cylindrical clusters of white 5-petaled blossoms; fruit, purplish drupe 2 to 3 cm across, pulp, thin and sweetish.

Distribution: Dry foothills, below 1500 m (5000 ft); chaparral, scrub oak, live oak woodlands; coast ranges, Napa County south to Baja California.

Fire Response Mechanism: Stump-sprouts vigorously after fire.

Wildlife Value: Preferred browse of deer and bighorn sheep. Fruits preferred food of birds, animals.

Cultural Value: Fruits sweet, eaten raw or peeled, dried, and stored. Pit ground for flour.

P. virginiana L. ssp. *demissa* (Nutt.) Sarg.

WESTERN CHOKE CHERRY (fig. 88). Large shrub or small tree, 1 to 5 m tall, deciduous with smooth gray brown bark, minutely hairy twigs; leaves simple, alternate, light green, lighter below, glabrous above, finely pubescent below, ovate, or broadly elliptic, finely toothed edges, abruptly pointed at apex, rounded or slightly indented at base, 5 to 10 cm long, 1.5 to 2.5 (rarely up to 5) cm wide; flowers, May through July, white petals 5 to 6 mm broad, many-flowered

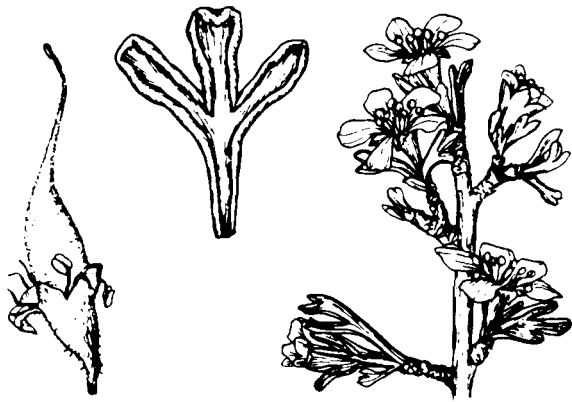


Figure 89-Bitterbrush, *Purshia glandulosa* (McMinn 1939).

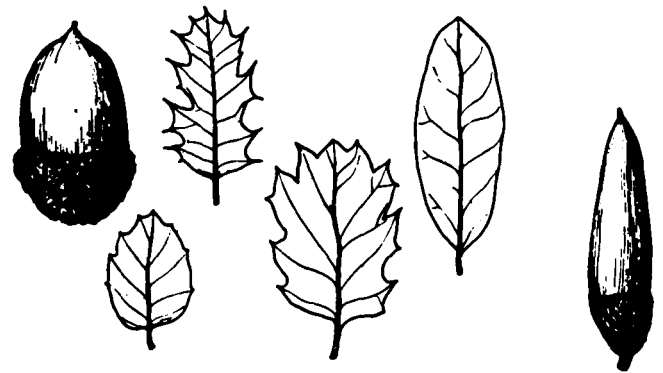


Figure 90-California scrub oak, *Quercus dumosa* (McMinn 1939).

clusters 5 to 11 cm long; fruit, dark red cherry 5 to 6 mm thick, bitter, with smooth round stone.

Distribution: Moist, brushy slopes, below 2500 m (8200 ft); yellow pine, live oak, black oak forests or woodlands, ceanothus chaparral; San Diego County north along Sierra Nevada, coast ranges, British Columbia.

Fire Response Mechanism: Shallow-rooted; spreads by rhizomes; sprouts from rhizomes after fire.

Wildlife Value: Staple browse, toxic if overgrazed by livestock; fruits preferred by birds, small mammals, black or brown bear.

Cultural Value: Fruit can be eaten raw, but slightly astringent.

Purshia glandulosa Curran. Rose Family (*Rosaceae*)
BITTERBRUSH (fig. 89). Erect evergreen shrub, 1 to 2.5 m tall, gray or brown bark, not very shreddy, young twigs glabrous and glandular; simple leaves and short vegetative stems alternate, 0.5 to 1 cm long, 3-cleft, tend to be rolled under at edges, in crowded fascicle-like clusters, somewhat darker green with glandular pits above, slightly fuzzy below; flowers, April to June, solitary, terminal blossoms with five pale yellow or white petals, 6 to 8 mm long; fruit, hairy akene.
Distribution: Transmontane dry slopes 900 to 2700 m (2800-9000 ft); chaparral to Joshua tree, pinyon-juniper, or juniper woodlands; western Colorado Desert, Cajon Pass, Mojave Desert to Mono County, Nevada, Arizona.

Fire Response Mechanism: Variable stump-sprouter.

Wildlife Value: Staple browse for livestock, deer.

Cultural Value: None known.

Quercus spp.

Beech Family (*Fagaceae*)

SHRUB OAKS. Fifteen species native to California. Usually tree-like, the two taxa described here are shrubs found in exposed environmental conditions and subject to frequent fire.

Wildlife Value: Young shoots and leaves preferred browse of deer, bighorn sheep, cattle, goats. Acorns important food for many birds, small mammals.

Cultural Value: Acorns provided staple food for Native Americans. Nuts hulled, ground, leached to remove water soluble tannins, and used as flour for baking or in soups. Bark and some insect galls used for various medicinal purposes, making dye, curing hides (Balls 1972).

la. Leaves green on both surfaces, slightly paler below, lacking fuzz of any kind; shrub or small tree in chaparral up to 1500 m elevation.

INTERIOR LIVE OAK, *Q. wislizenii* var. *frutescens*

1b. Leaves dark green above, pale and minutely fuzzy below, 1.2 to 4 cm long; thin-walled acorn cup encloses about half the nut; common shrub or small tree on dry chaparral slopes below 1500 m. SCRUB OAK, *Q. dumosa*

Q. dumosa Nutt.

CALIFORNIA SCRUB OAK (fig. 90). Evergreen, monoecious shrub or small tree, 1 to 3 m tall, young stems reddish brown becoming dark brown to grayish brown; leaves simple and alternate, shape and size variable, oblong or roundish to spatulate, 1.2 to 4.0 cm long, 6 to 20 mm broad, petiole 3 to 5 mm long, brittle to leathery and thick, plane or undulate,

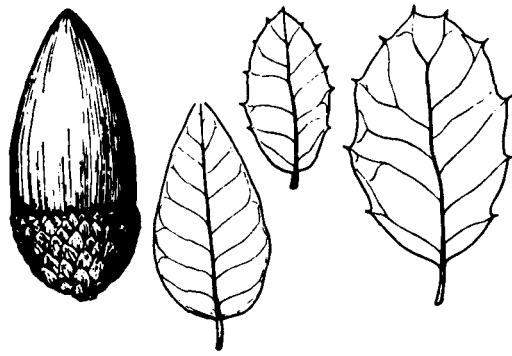


Figure 91-Interior live oak, *Quercus wislizenii* var. *frutescens* (McMinn 1939).

sometimes dentate, green, shiny, hairless above, may be concave, paler and pubescent below; flowers, March to May, male flowers in catkins 2.5 to 5 cm long, female flowers in clusters of 2 to 3 in axils of upper leaves; acorn, ovoid and rounded or acute at apex, matures in one season, with cup enclosing up to one-half of the acorn, cup scales ovate or united at least near base. Palmer oak (*Q. dunnii* Dell) is similar species with wavy-margined, spiny leaves; acorn cup flares out and away from nut around rim; localized in San Jacinto, San Bernardino Mountains at Coxey Meadow.

Distribution: Common on dry slopes below 1500 m (5000 ft); southern California, west base of Sierra Nevada to northern California.

Fire Response Mechanism: Stump-sprouts after fire, cutting.

Wildlife Value: See genus.

Cultural Value: See genus.

Q. wislizenii A. DC var. *frutescens* Engelm.

INTERIOR LIVE OAK (fig. 91). Small evergreen monoecious tree or sometimes shrubby (1 to 5 m tall), young twigs green to reddish becoming gray; leaves usually convex, ovate or oblong to lanceolate, plane or slightly wavy, margin entire to dentate, dark green above, green and somewhat paler and hairless below, 2 to 6 cm long (mostly 3 to 4 cm), 1 to 2.5 cm wide, petiole 2 to 5 mm long; flowers, March to May, male flowers in catkins 2 to 5 cm long, female flowers in clusters of 2 to 4 in upper leaf axils; acorns oblong-ovate and abruptly pointed, maturing second season, cup, 8 to 12 mm wide, 12 to 18 mm long.



Figure 92-Coffeeberry, *Rhamnus californica* (McMinn 1939).

Distribution: Chaparral, valleys, slopes, below 1500 m (5000 ft); lower slopes of Sierra Nevada, Shasta County, south to mountains of southern California.

Fire Response Mechanism: Stump-sprouts after fire, cutting.

Wildlife Value: See genus.

Cultural Value: See genus.

Rhamnus californica Esch.

Buckthorn Family (*Rhamnaceae*)

COFFEEBERRY (fig. 92). Shrub, 1 to 4 m tall, persistent leaves, bark on young twigs reddish; leaves alternate, flat to somewhat revolute, oval or elliptic, taper to a point or obtuse, 2.5 to 8 (up to 10) cm long, 1 to 3 cm wide, usually glabrous, dark green above, glabrous or with few hairs, paler below with prominent midvein below, sometimes rusty or pale green, sometimes minutely serrate; flowers, April through June, small and greenish, usually without petals, less than 3 mm long, 6- to 50-flower clusters; fruit, green, black, or red, juicy berry with two "coffeebean" seeds, 7 to 9 mm long.

Distribution: Hillsides and ravine riparian areas, 1200 to 2100 m (4000-7000 ft); mixed conifer to redwood forests, chaparral; east and west slopes of Sierras, Mono and Madera Counties, south to Riverside, Los Angeles Counties.

Fire Response Mechanism: Stump-sprouts after fire, cutting.

Wildlife Value: Staple browse; fruits, preferred food of birds, bears.

Cultural Value: Berries edible and sweet, laxative effect.



Figure 93-Redberry, *Rhamnus crocea*.

R. crocea Nutt.

REDBERRY (fig. 93). Densely branched evergreen shrub, to 2 m tall, stiff, relatively divaricate gray branchlets often ending with a sharp point; leaves often in bundles and dark green above (sometimes lighter), yellowish green below, leaves usually feel leathery, ovate or nearly round, 5 to 15 mm long, 3 to 6 mm wide, usually glabrous or slightly pubescent below with smooth margins or often serrated; flowers, February to April, greenish, tiny, small clusters from the leaf axils; fruit, red berry 5 to 6 mm long with two seeds.

Distribution: Dry slopes, below 900 m (3000 ft); coastal sage scrub (soft chaparral); Lake County south to San Diego County, Baja California.

Fire Response Mechanism: Stump-sprouts after fire.

Wildlife Value: Preferred browse of deer, livestock.

Cultural Value: Berries edible, bark was peeled, ground, dried, and used as laxative.

R. ilicifolia Kell.

HOLLY LEAF REDBERRY (fig. 94). Erect evergreen shrub, similar to redberry (*R. crocea*), but taller, to 4 m tall, young stems slightly pubescent, reddish with bark becoming gray; leaves 1 to 4 cm long, 1 to 4 cm wide, spine-toothed margins or rarely entire, leaf darker above, somewhat pubescent above and below; flowers, March to May, clusters of tiny greenish flowers, almost always without petals; fruits, red berry 3 to 5 mm across, much like redberry (*R. crocea*). Redberry and hollyleaf redberry often occur together.

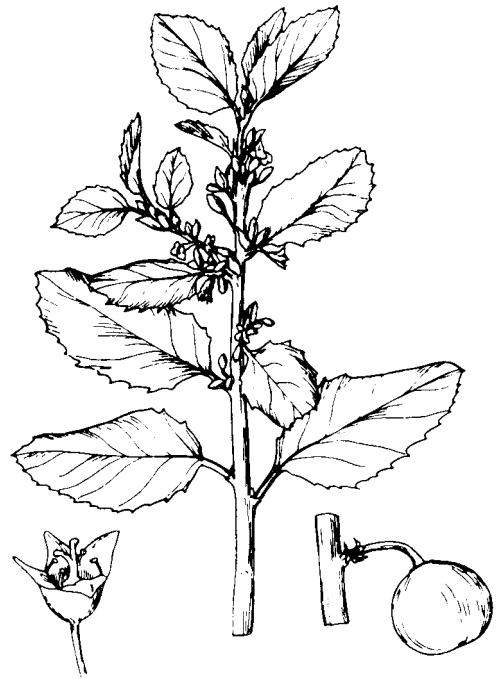


Figure 94-Hollyleaf redberry, *Rhamnus ilicifolia* (McMinn 1939).

Distribution: Up to 2000 m (6600 ft); chaparral to yellow pine forests or woodlands; Humboldt County, south to San Diego County, Baja California.

Fire Response Mechanism: Stump-sprouts after fire.

Wildlife Value: Probably same as redberry (*R. crocea*).

Cultural Value: Probably same as redberry (*R. crocea*).

Rhododendron occidentale (T. & G.) Gray

Heath Family (*Ericaceae*)

WESTERN AZALEA (fig. 95). Loosely branched deciduous shrub, 1 to 3 m tall, often branching 4 to 6 times in umbrella-like pattern, brown bark on young stems becoming gray and shreddy; leaves simple, alternate, thin, light green, sometimes pubescent, midvein yellowish red and obvious, elliptic or obovate to oblanceolate, 3 to 9 cm long, 1.5 to 3.5 cm wide, stiff hairs along margins, lacking serration; flowers, May to July, showy, large, white or tinged pink; fruit, capsule 1 to 2 cm long.

Distribution: Along streams, moist places, below 2300 m (7500 ft); mixed conifer, ponderosa or Jeffrey pine, willow; Humboldt, Shasta Counties, south to San Jacinto, Palomar, and Cuyamaca Mountains.

Fire Response Mechanism: Thicket-forming by lateral shoots.

Wildlife Value: Toxic to cattle, sheep, much used by beaver.

Cultural Value: None known.



Figure 95-Western azalea, *Rhododendron occidentale* (T. & G.) Gray (McMinn 1939).



Figure 97-Laurel sumac, *Rhus laurina* (McMinn 1939); renamed *Malosma laurina*.

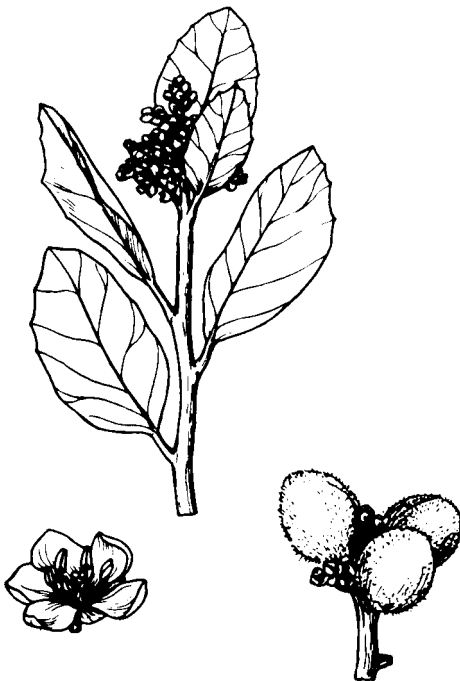


Figure 96-Lemonadeberry, *Rhus integrifolia* (McMinn 1939).

Rhus integrifolia (Nutt.) Benth. & Hook.

Sumac Family (*Anacardiaceae*)

LEMONADEBERRY (fig. 96). Rounded evergreen shrub, 1 to 3 m tall, fine fuzzy twigs and leaves; leaves leathery, mid-vein prominent, flat, smooth margins or irregularly toothed, sometimes with curled down edges, 2.5 to 6 cm long, 1 to 4 cm wide, petiole 3 to 4 mm long, elliptic and rounded at both ends, glaucous to fuzzy with pubescence on veins at least, dark green above and paler below; flowers, January to March, white or pink oval clusters; fruit, reddish and somewhat flattened, waxy drupe.

Distribution: Ocean bluffs, canyons below 600 m (2000 ft); inland to west Riverside County, Santa Barbara to Baja California.

Fire Response Mechanism: Roots from branches touching ground; stump sprouts after fire, cutting.

Wildlife Value: Low value browse; seed used by birds, including 8 to 9 percent of diet of roadrunners.

Cultural Value: Fruits quite tart, yield a lemony drink when added to water. Cahuillas made tea of leaves to treat coughs and colds (Clarke 1977).

R. laurina Nutt.

LAUREL SUMAC (fig. 97). This species renamed *Malosma laurina* Nutt. ex. Abrams. *Rhus l.* retained to be consistent with Munz (1974). Leafy, evergreen shrub, 2 to 5 m tall, reddish-brown bark; leaves oblong-lanceolate to ovate or elliptical, mature leaves 5 to 10 cm long, 2 to 5 cm wide,



Figure 98-Sugar bush, *Rhus ovata*.

petiole 1 to 3 cm long, somewhat aromatic, somewhat glaucous, green, lighter below, usually folded upwards along midvein, like sugar bush (*R. ovata*), tapering to soft point; veins, leaf margins, petioles, new growth twigs, reddish; produces new growth before flowering in May and June, hence old inflorescences frequently on ends of branches and obvious; flowers numerous, small (1 to 2 mm), white, dense panicle 5 to 15 cm long; fruit, whitish or greenish to reddish glabrous drupe, 2 to 4 mm long, single smooth stone; frost sensitive, stands occasionally severely frosted with resultant large quantities of dead leaves and twigs.

Distribution: Dry slopes below 600 m (2000 ft); coastal sage scrub (soft chaparral), chamise chaparral; Santa Barbara County to Baja California.

Fire Response Mechanism: Stump sprouts vigorously after fire, seedlings common after fire but mortality very high.

Wildlife Value: Low value browse; flowers commonly visited by honey bees; seeds important for quail, wren tits, other birds.

Cultural Value: Unknown, probably like lemonadeberry (*R. integrifolia*).

R. ovata Wats.

SUGAR BUSH (fig. 98). Evergreen shrub, 1.5 to 3 m tall, stout reddish, hairless twigs; leaves shiny green, thick, leathery, smooth margins, midvein prominent, ovate to lanceolate, tapering to a point at apex, 4 to 8 cm long, 2 to 4 cm wide, petiole 1 to 1.5 cm long, cupped upwards at edges from

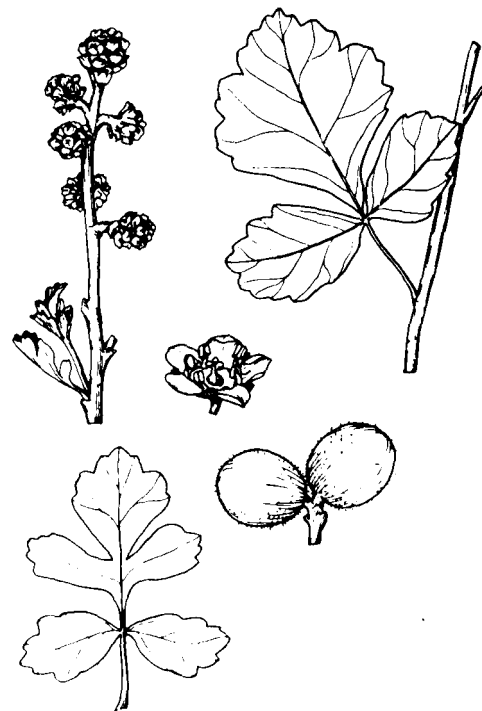


Figure 99-Squaw bush (basket sumac), *Rhus trilobata* (McMinn 1939).

midvein to form a trough, edges wavy; flowers, April and May before producing new growth, hence old inflorescences not on ends of branches, flower panicles often present long before flowers, 5-parted, pinkish white, dense panicle; fruit, reddish, pubescent, acid-tasting, sticky drupe, 7 to 8 mm diameter, single stone; relatively frost resistant.

Distribution: Dry chaparral slopes, mostly 300 to 1700 m (1000-5700 ft); coastal sage scrub (soft chaparral, chaparral); Santa Barbara County to northern Baja California.

Fire Response Mechanism: Stump-sprouts rapidly after fire, cutting.

Wildlife Value: Low value browse; flowers attract bees, other insects; fruits important for birds, many animals.

Cultural Value: Berries dried, eaten fresh, or ground into flour; white sap on berries used as acid flavoring (Clarke 1977).

R. trilobata Nutt.

SQUAW BUSH (BASKET SUMAC) (fig. 99). Sprawling to erect normally deciduous shrub, stems to 1.5 m long, young twig ends tend to be reddish becoming gray with age, branches spreading and pubescent; leaves 3-foliate, minutely hairy, leaflets may be pubescent ovate to obovate or almost diamond-shaped in outline with rounded serrations at apex, terminal 1 to 3 cm long, about as wide, terminal leaflet larger than laterals, lower margin concave taper to petiole, lower margin of lateral leaflets convex to petiole; flowers, March to May, yellowish clustered spikes; fruit, reddish sticky, hairy drupe.

Distribution: Canyons and dry washes, below 1200 m (4000 ft); coastal sage scrub (soft chaparral), ceanothus chaparral, live oak and canyon live oak woodlands; southern California to Butte County.

Fire Response Mechanism: Stump-sprouts after fire, cutting.

Wildlife Value: Low value or staple browse for livestock, mule deer. Seeds eaten by quail, other birds.

Cultural Value: Native Americans used stems in basket making. Berries used in several forms, food and medicine. Hopis used berry juice in body paint. Navajos made black dye from roots (Clarke 1977).

Ribes spp. Saxifrage Family (*Saxifragaceae*)
CURRENTS and GOOSEBERRIES. Erect or trailing shrubs, drought or winter deciduous or evergreen, with simple, alternate, palmately lobed leaves and leaf venation; stems armed with spines at nodes where leaves join the stem or without spines; several species with both spines and internode prickles; flowers, 5-parted, produce many-seeded berries, may be covered with prickles, otherwise edible. Munz (1974) lists 17 species of *Ribes* in southern California; 11 of these have spines, 6 have pubescent to sticker covered fruits. Seven species included here.

Fire Response Mechanism: Most species stump-sprout after fire, cutting.

Wildlife Value: Most species provide fair to poor browse for deer, livestock, bighorn sheep. Most berries taken by birds, many mammals, insects.

Cultural Value: Berries edible. Most serious problem is coat of prickles that encase berries of some species. According to Clarke (1974), currants and gooseberries important ingredients in pemmican, an important part of diet of Native Americans.

- 1a. Stems with spines at nodes.
 - 2a. Stems usually with bristles or prickles between nodes.
 - 3a. Leaves sticky; straggling shrub on dry pine woodland slopes above 2100 m elevation.
 MOUNTAIN GOOSEBERRY,
R. montigenum
 - 3b. Leaves not sticky; spreading shrub in shaded moist coast sage and chaparral canyons below 450 m elevation.
 FUCHSIA-FLOWERED GOOSEBERRY,
R. speciosum
- 2b. Stems without bristles or prickles between nodes.
 - 4a. Leaves more or less equally pubescent on both surfaces; erect shrub on shady, moist woodland slopes below 1800 m.
 BITTER GOOSEBERRY, *R. amarum*
 - 4b. Leaves darker green and less pubescent above; spreading shrub on dry chaparral to conifer slopes between 1100 and 2600 m.
 CHAPARRAL GOOSEBERRY, *R. roezlii*
- 1b. Stems without spines at nodes.
 - 5a. Young stems covered with woolly and/or gland-tipped bristly hairs; multiple stemmed shrub com-

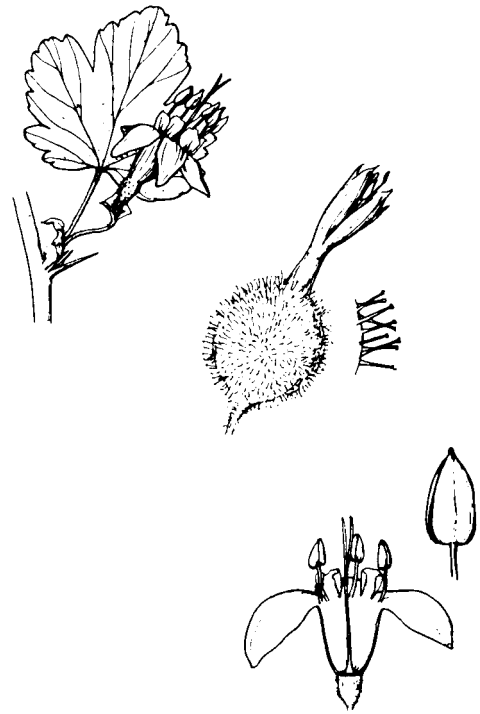


Figure 100-Bitter gooseberry, *Ribes amarum* (McMinn 1939).

mon on dry chaparral and woodland slopes below 1500 m.

CHAPARRAL CURRANT, *R. malvaceum*

- 5b. Young stems glabrous or with fine puberulence.
 - 6a. Leaves rather thin and flexible, somewhat paler and more pubescent below; slender stemmed shrub of moist places between 900 and 3000 m.

SIERRA CURRANT, *R. nevadense*

- 6b. Leaves somewhat stiff and leathery, color and pubescents nearly equal above and below; erect shrub in moist places in scrub oak chaparral and oak woodlands below 500 m.

GOLDEN CURRANT,
R. aureum var. *gracillimum*

R. amarum McCl.

BITTER GOOSEBERRY (fig. 100). Erect, drought deciduous shrub, 1 to 2 m tall, brown nodal spines, lacking prickles on rest of stems, young stems pubescent; leaves pubescent to somewhat glandular-puberulent on both surfaces roundish to somewhat palmate, heart-shaped at base, darker green above, 1.5 to 3 cm wide, petiole to 3 cm long, 3- to 5-lobed with rounded serrations, leaves develop in January and February; flowers, February to April, 1 to 3 on pubescent peduncles, blossoms purplish; fruit, berry, 1.5 to 2 cm diameter, densely covered with gland-tipped bristles.

Distribution: Shady, usually moist wooded slopes below 1800 m (6000 feet); San Diego to Monterey, El Dorado Counties.

Fire Response Mechanism: Resprouts after burning, cutting.



Figure 101-Golden currant, *Ribes aureum* (McMinn 1939).

Wildlife Value: Low value browse, fruit eaten by many animals.

Cultural Value: Edible berries well armed (see Clarke 1974).

R. aureum Pursh var. *gracillimum* (cov. & Britt.) Jeps.
GOLDEN CURRANT (fig. 101). Erect, drought deciduous shrub, bark gray or brown, 1 to 2 m tall, stems without spines, young stems and leaves nearly glabrous; leaves fairly stiff, leathery, mostly 3-lobed, light green with palmate venation, lobes rounded or toothed, 2 to 5 cm long, 1.5 to 5 cm wide, petioles 1 to 4 cm long; flowers, January to June, 5 to 15 odorless yellow blossoms becoming red, 5-parted, 3- to 7-cm long raceme; fruit, berry 6 to 8 mm diameter without bristles, mostly orange to yellowish, color varies sometimes on same plant.

Distribution: Moist places on foothill areas below 500 m (1650 ft); scrub oak chaparral and oak woodland; Los Angeles and Riverside Counties, north to British Columbia, east to Rocky Mountains.

Fire Response Mechanism: Sprout after cutting, fire.

Wildlife Value: Low value browse; fruit eaten by numerous species.

Cultural Value: Tasty berry used fresh, in cooking; probably used by Native Americans in several ways, an ingredient of pemmican (Clarke 1977).

R. malvaceum Sm. Abrams.

CHAPARRAL CURRANT (fig. 102). Drought deciduous shrub, 1 to 2 m tall, 5 to 20 straight stout stems from base;

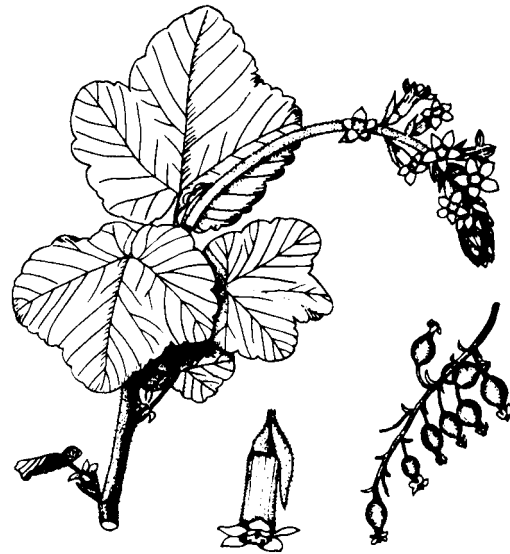


Figure 102-Chaparral currant, *Ribes malvaceum* (Munz 1974).

young stems covered with woolly- and gland-tipped bristly hairs; leaves roundish in outline, 3-to 5-lobed, palmate venation, wrinkled surface, dull green above with stalked glands, margins serrate, paler green and pubescent below, 2 to 6 cm long and wide, petioles 1 to 5 cm long; flowers, December to April, 10 to 25 rose-colored blossoms in drooping terminal racemes, corolla tubular and abruptly flaring at apex, 8 to 12 mm long tube; fruit, purplish-black berry, 6 mm diameter, somewhat hairy and glandular. Subspecies *viridifolium* Abrams. has greener leaves and more coarse glandular pubescence. *R. indecorum* Eastw. similar with white flowers. *R. cereum* Dougl. has more finely toothed leaves, found in San Gabriel Mountains, on Mt. Pinos.

Distribution: Common foothill shrub of dry places, several chaparral communities, oak woodlands, closed cone pine communities, mostly below 1500 m (5000 ft); San Jacinto Mountains to Santa Ana, Santa Monica Mountains.

Fire Response Mechanism: Same as genus.

Wildlife Value: See *R. aureum* var. *gracillimum*.

Cultural Value: See *R. aureum* var. *gracillimum*.

R. montigenum McCl.

MOUNTAIN GOOSEBERRY (fig. 103). Low, straggling, much branched, drought deciduous shrub, 0.3 to 0.6 m tall, usually bristly all along stems (sometimes almost smooth); leaves glandular, sticky, appear round in outline, heart-shaped base, 1 to 4 cm long and wide, 5-cleft with much incised and toothed lobes, palmate venation, spines at base of

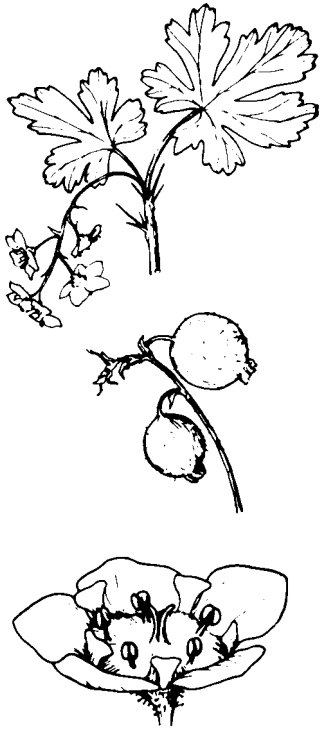


Figure 103-Mountain gooseberry, *Ribes montigenum* (McMinn 1939).

petioles; flowers, July and August, 3 to 7 saucer-shaped blooms, short purplish to greenish white raceme; fruit, bristly red berry about 6 mm diameter.

Distribution: Dry rocky places, 2100 to 3800 m (7000-12,500 ft); alpine and limber pine communities; San Jacinto, San Bernardino, San Gabriel Mountains to British Columbia, Rocky Mountains.

Fire Response Mechanism: Variable root-sprouter after fire, cutting.

Wildlife Value: Berries edible.

Cultural Value: Fresh berries good raw, mashed and strained through sieve to remove bristles (Clarke 1977).

R. nevadense Kell.

SIERRA CURRANT (fig. 104). Slender stemmed, drought deciduous shrub, 1 to 2 m tall, without spines or prickles, young growth glabrous or puberulent; leaves roundish, rather thin and flexible, palmately 3- to 5-lobed, lobes obtuse, bluntly toothed, resinous-dotted and glabrous above, somewhat pubescent and paler below, 3 to 9 cm long and wide, petioles 1 to 6 cm long; flowers, April to July, drooping 8- to 12-flowered racemes, blossoms tubular and abruptly flaring at ends, tube approximately 5 mm long, small white petals with erect pink rose to red sepals; fruit, blue black somewhat glandular, glaucous berry about 8 mm diameter.

Distribution: Moist places, stream sides; 900 to 3000 m (3000-10,000 ft); Palomar, San Gabriel, San Bernardino, and San

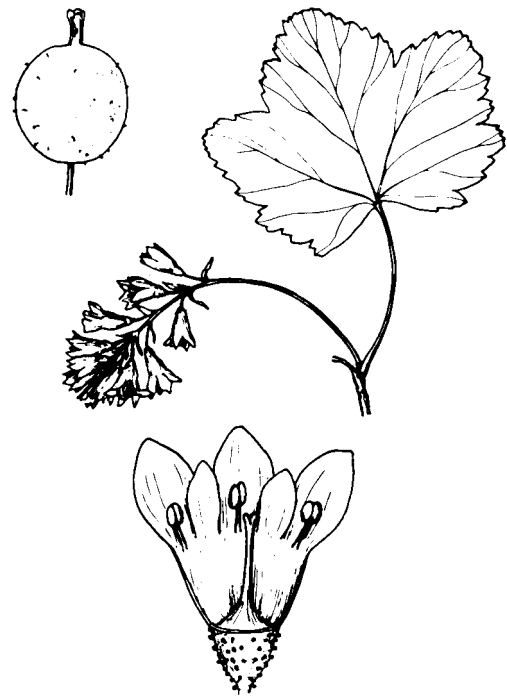


Figure 104-Sierra currant, *Ribes nevadense* (McMinn 1939).

Jacinto Mountains, north to Sierra Nevadas, Shasta and Modoc Counties.

Fire Response Mechanism: Resprouts when burned, cut.

Wildlife Value: Berries eaten, especially by birds.

Cultural Value: Berries edible (Clarke 1977).

R. roezlii Regel.

CHAPARRAL GOOSEBERRY (fig. 105). Drought deciduous shrub, 0.5 to 1.2 m tall, long spreading stems and short rigid branchlets, 1 to 3 straight or recurved spines at leaf nodes; leaves round in outline with palmate venation, 1.5 to 3.5 cm long and wide on 0.6 to 2 cm petiole, dark green with fine, short pubescence above, paler below, cleft into 3 to 5 lobes; flowers, April to July, 1 to 2 glandular, purplish red blooms with whitish petals, 3 to 5 mm long; fruit, purple or sometimes pinkish or yellowish berry, 1.4 to 1.6 cm diameter, covered with stout spines, usually with some gland-tipped bristles.

Distribution: Dry slopes 1100 to 2600 m (3500-8500 ft); ponderosa or Jeffrey pine, bigcone Douglas-fir woodlands or forests, manzanita chaparral; Tulare County south to mountains of southern California, San Diego County.

Fire Response Mechanism: Stump-sprouts after fire, cutting.

Wildlife Value: Staple browse for deer and bighorn sheep; fruit eaten by birds and small mammals.

Cultural Value: Berries dried and stored or eaten raw.

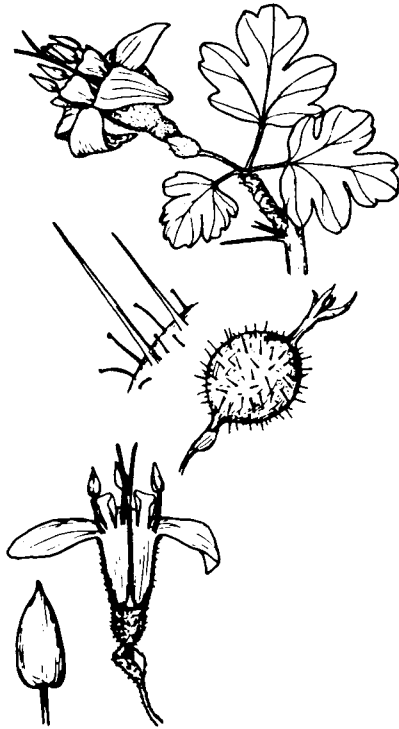


Figure 105-Chaparral gooseberry, *Ribes roezlii* (McMinn 1939).

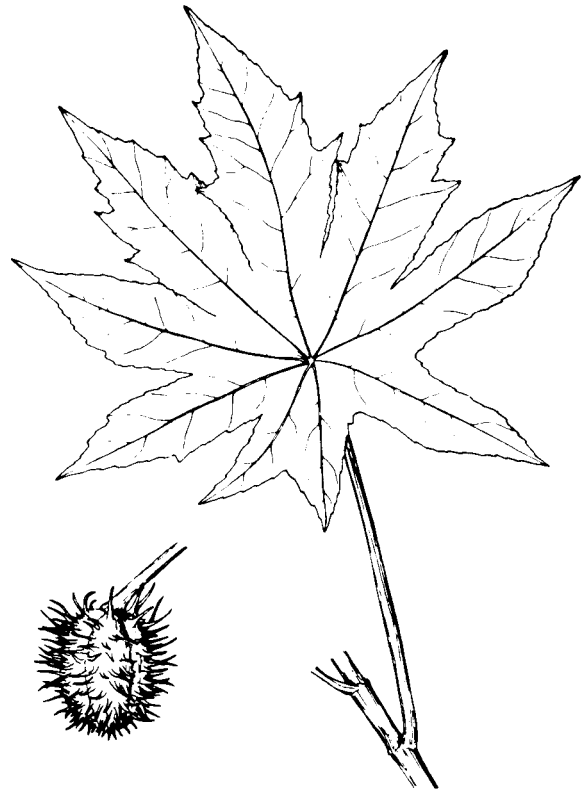


Figure 107-Castor-bean, *Ricinus communis* (McMinn 1939).



Figure 106-Fuchsia-flowered gooseberry, *Ribes speciosum*.

R. speciosum Pursh.

FUCHSIA-FLOWERED GOOSEBERRY (*fig. 106*). Ever-green shrub, 1 to 2 m tall, spreading bristly branches, stems with three nodal spines 1 to 2 cm long; leaves roundish to obovate with palmate venation, 1 to 3.5 cm long and wide, petiole 6 to 25 mm long, glossy dark green above, paler below, 3- to 5-lobed; flowers, January to May, 1 to 4 drooping, crimson, peduncled blossoms with stamens extending three times the length of petals; fruit, bristly, glandular, oval-shaped berry about 1 cm long.

Distribution: Shaded, moist canyons below 500 m (1500 ft); coastal sage scrub (soft chaparral), chaparral; Santa Clara to San Diego Counties, to north Baja California.

Fire Response Mechanism: Same as genus.

Wildlife Value: Berries and flowers used by insects, birds, small animals.

Cultural Value: Edible berries armed with bristles; colorful shrub useful as an ornament (McMinn 1964).

Ricinus communis L. Spurge Family (*Euphorbiaceae*)
CASTOR-BEAN (*fig. 107*). Monoecious subshrub, to 3 m tall; young stems green or reddish or becoming reddish then brown, older stems have a ring at each leaf scar, easily identified by its large leaves, 10 to 30 cm long, 10 to 40 cm broad, prominently palmate 5-to 11-veined and lobed, glossy, lighter green below; flowers most of year, inconspicuous clusters of blooms with female flowers higher on stem than male; fruit, spiny capsule.

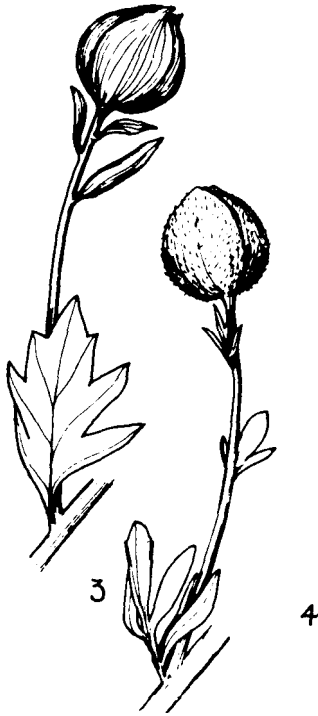


Figure 108--Matilija poppy, *Romneya coulteri* (A); *Romneya trichocalyx* (B) (McMinn 1939).

Distribution: Native of Old World, escaped from cultivation around arroyos, waste places up to 730 m (2000 ft).

Fire Response Mechanism: Rather flammable, nonsprouter.

Wildlife Value: Low value, toxic in large quantities.

Cultural Value: Seeds more poisonous than leaves. Seeds ground into salve for sores; source of castor oil. This species not available to Native Americans.

Romneya coulteri Harv. Poppy Family (*Papaveraceae*)
MATILIJ POPPY (fig. 108). Subshrub with numerous wand-like green stems becoming gray with age and with clear bitter juice, from woody base, to 2.5 m tall; leaves simple, sometimes sparsely toothed, alternate, olive-colored, lighter below, divided into 3 to 5 pinnate lobes, sometimes nearly separate, appear as leaflets, venation is pinnate, leaf 5 to 20 cm long, 5 to 15 cm wide, petiole 1 to 2 cm long; flowers, May to August, white and showy with crinkled petals 5 to 10 cm long; fruit, capsule 3 to 4 cm long. Hybridizes with *R. trichocalyx*.
Distribution: Dry washes, canyons, below 1200 m (4000 ft); coastal sage scrub (soft chaparral) and chaparral; Ventura or Santa Barbara to San Diego Counties, Baja California.

Fire Response Mechanism: Sprouts readily from underground roots.

Wildlife Value: Low value.

Cultural Value: Watery sap may have been used as a drink.

Rosa spp. Rose Family (*Rosaceae*)
ROSES. Erect or sprawling prickly shrubs. Leaves alternate, deciduous or almost evergreen, compound, with 5 to 7 leaflets

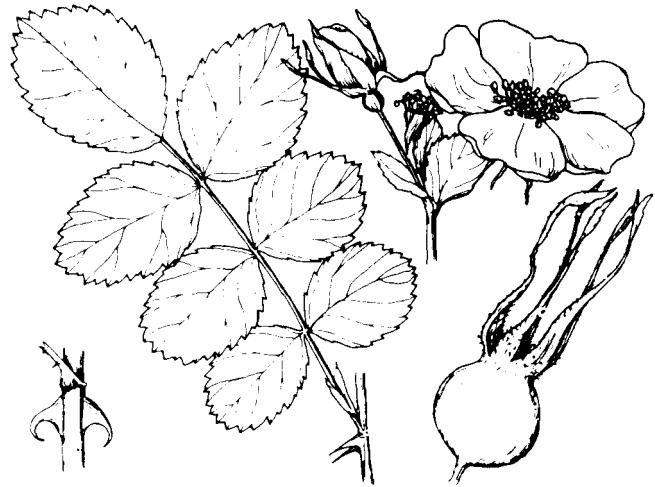


Figure 109--California wild rose, *Rosa californica* (McMinn 1939).

arranged pinnately on leaf petiole. Ear-like appendices (stipules) at base of petioles are attached to stem along sides of petiole. Stem prickles in species discussed here may be straight or recurved. Flower, spring and summer, rose pink to red, may be borne singly or in cluster on floral stems. Munz (1974) lists three species in southern California; two included here, most common below 1800 m (6000 ft). Third species, *R. woodsii* Linde. with three high mountain, desert slope variations which are difficult to separate from *R. gymnocarpa*, since all have straight, slender prickles. *R. gymnocarpa* fruit easily identified because flower parts shed from rose hip fruit.
Distribution: Throughout region in moist and often more or less shaded areas.

Fire Response Mechanism: Most species resprout from basal organs.

Wildlife Value: Useful as food, cover.

Cultural Value: Most rose species used for numerous purposes, especially as source of minerals and vitamin C.

1a. Stem prickles usually stout and recurved; erect shrub in moist places associated with willows and other riparian communities below 1800 m.

CALIFORNIA WILD ROSE, *R. californica*

1b. Stem prickles mostly slender and straight; slender shrub in moist shaded woodlands below 1500 m.

WOOD ROSE, *R. gymnocarpa*

R. californica C. & S.

CALIFORNIA WILD ROSE (fig. 109). Erect, branched, 1 to 3 m tall, young stems greenish with short prickles, stems



Figure 110—Wood rose, *Rosa gymnocarpa* (McMinn 1939).

become reddish brown and armed with stout recurved thorns; leaves compound, divided into 5 to 7 leaflets; leaflets green, nearly oval, serrate, few scattered hairs to clearly pubescent, 1 to 5 cm long, wedge-shaped appendages (stipules) at base of leaf; flowers, April through August, rose-colored or pink, few to 30 in showy clusters, petals 1 to 2.5 cm long, ovary below sepals; fruit, bright orange rose hip, 8 to 16 mm long, 10 to 15 mm thick.

Distribution: Moist places, canyons, near streams, below 1800 m (6000 ft); willow and other riparian plant communities; Washington, Oregon, east to Rocky Mountains, south to Baja California.

Fire Response Mechanism: Roots from branchlets, suckers; stump-sprouts after fire, cutting.

Wildlife Value: Fruits staple for birds.

Cultural Value: Hips and flowers used in tea as source of vitamin C, calcium, phosphorus, iron (Clarke 1977).

R. gymnocarpa Nutt. in T. & G.

WOOD ROSE (fig. 110). Slender shrub mostly 1 m tall or less, reddish-brown stems armed with slender straight prickles, numerous bristles; leaves green, with stipules at base of petioles adherent to petiole stems, petiole up to 9 cm long including 5 to 7 leaflets nearly oval to roundish, leaflets 1 to 2.5 cm long, 0.6 to 1.2 cm wide with serrated margins commonly with glands on tips of teeth, glabrous and equal color on both surfaces; flowers, May to July, mostly solitary at ends of branchlets, red petals, ovary below sepals, ovary and sepals nearly glabrous; fruit, reddish rose hip; as hip matures, sepals

and other flower parts dry and fall away, leaving naked rose hip.

Distribution: In more or less moist shaded woods below 1500 m (5000 ft); Palomar and San Gabriel Mountains, north to British Columbia, and Montana.

Fire Response Mechanism: Probably resprouts following fire, cutting.

Wildlife Value: Poor browse; flowers and hips important staple for birds, animals, insects.

Cultural Value: Rose hips an important source of vitamin C, calcium, phosphorus, and iron. Native Americans used roots, hips, and flowers (Clarke 1977).

Rubus spp. Rose Family (*Rosaceae*)

BLACKBERRIES. Trailing or erect shrubs with or without spines and bristles. Leaves alternate, simple, or compound; if compound, generally 3 to 5 parted. First year canes normally do not produce flowers; in second year, flowers appear and foliage may appear different. Stipules at base of petioles adnate (connected) to petioles. Flowers, 5-parted, usually white or pink or sometimes red solitary or in small clusters. Fruits, many drupelets crowded on elevated receptacle. Munz (1974) lists seven species in southern California, three of which are included here. Three other species which Munz lists have escaped from cultivation; the fourth, *R. glaucifolius* Kell. var. *ganderi* (Bailey), Munz identified with shaded woods and coniferous forests on Palomar and Cuyamaca Mountains in San Diego County at 1400 to 1650 m (4500-5500 ft). Of the following species, the above is most easily confused with western raspberry (*R. leucodermis* var. *bernardinus*), but stems of western raspberry more densely covered with prickles.

1a. Stems without prickles or spines, unarmed; common shrub in open conifer woodlands.

THIMBLEBERRY, *R. parviflorus*

1b. Stems with prickles.

2a. Leaves and petioles (stalk) with prickly-like pubescence; common shrub in many plant communities below 900 m.

CALIFORNIA BLACKBERRY, *R. ursinus*

2b. Leaves without prickles; leaf petioles (stalks) and stems with relatively few prickles; shrub in yellow pine woodlands.

WESTERN RASPBERRY,
R. leucodermis var. *bernardinus*

R. leucodermis Dougl. ex T & G. var. *bernardinus* (Greene) Jeps.

WESTERN RASPBERRY (fig. 111). Straggly shrub with trailing, prickly stems, some recurved prickles, arched and branched, may root at tips, brambles 1 to 2 m high; leaves compound with 2 to 5 leaflets, whitish tomentum below, green above, prickly stalked, leaflets ovate to lanceolate, with terminal larger, 3 to 9 cm long, 1 to 5 cm wide, irregularly serrate; flowers, May to July, 3 to 10 blossoms in compact clusters, 5-petaled, white, 7 to 10 mm broad; fruit, dark red to black raspberry, sweet, sometimes dry and abortive.



Figure 111-Western raspberry, *Rubus leucodermis* (McMinn 1939).

Distribution: Dry flats, slopes, 1400 to 2300 m (4700-7500 ft); yellow pine communities; mountains of southern California north to British Columbia.

Fire Response Mechanism: Root-sprouts after fire; spreads by rooting-branchlets.

Wildlife Value: Fruits staple for game, birds, and small mammals.

Cultural Value: Berries edible. Leaves can be dried, used for tea (Clarke 1977).

R. parviflorus Nutt.

THIMBLEBERRY (fig. 112). Low, scrambling deciduous shrub, 1 to 2 m tall, without prickles; leaves large, simple, palmately 5-lobed, 9 to 13 cm long, 10 to 16 cm broad, unequally serrate, green with soft pubescence to tomentose on both surfaces, more so below; flowers, March through August, blooms 2 to 5 cm broad, few-flowered clusters, white petals 1.5 to 2 cm long; fruit, dull red berry, somewhat like a blunt strawberry, 1 to 1.6 cm broad.

Distribution: Open woods and canyons, below 2400 m (8000 ft); yellow pine, mixed conifer, white fir woodlands or forests; San Diego County to Alaska.

Fire Response Mechanism: Sprouts from underground roots after fire, cutting.

Wildlife Value: Berries staple food of many birds and mammals; low value browse.

Cultural Value: Berries eaten raw or dried and stored, or used as ingredient in pemmican. Young shoots can be eaten fresh or boiled (Clarke 1977).



Figure 112-Thimbleberry, *Rubus parviflorus*.

R. ursinus C. & S.

CALIFORNIA BLACKBERRY (fig. 113). Evergreen trailing or climbing shrub with many densely prickled stems, somewhat prickly leaves, young stems greenish becoming brown; leaves green, lighter below, pubescent above, nearly tomentose below, mostly 3-parted on bristly stalks, leaf sometimes not compound but palmate-shaped, leaflets mostly ovate to oval, 2.5 to 12 cm long, 2 to 7 cm wide; flowers, March through July, white blooms 2 to 3 cm across, few to several flowered clusters near end of leafy branchlets; fruit, sweet, black, somewhat bristly blackberry, to 2 cm long.

Distribution: Below 900 m (3000 ft); many plant communities; Oregon to Baja California.

Fire Response Mechanism: Sprouts from suckers after fire, cutting.

Wildlife Value: Fruits, important food of birds and animals.

Cultural Value: Fruits, edible. Roots boiled with water to relieve diarrhea. Half-ripe berries soaked in water to make a drink, leaves used for tea (Clarke 1977).

Salix spp.

Willow-Family (*Salicaceae*)

WILLOWS. Erect, dioecious shrubs to large trees with simple, alternate, deciduous leaves commonly associated with moist places. Flowers are single sex; on separate plants and borne in compact clusters called catkins. Male and female flowers are on separate plants. Leaves often start growing after plants flowered and are usually long and relatively narrow. Leaves tend to end in gradually tapering tip or base.



Figure 113-California blackberry, *Rubus ursinus* (Munz 1974).

Often, one end of leaf is abrupt, the other tapered. Munz (1974) lists nine shrub willows; only two given here. Two species listed below commonly occur below 2100 m (7000 ft) while remaining species tend to be rare below 1800 m (6000 ft) or are desert species.

- 1a. Bark gray and furrowed, young stems with gray hair; shrub or small tree along streams and other wet places.
SANDBAR WILLOW, *S. hindsiana*
- 1b. Bark smooth and dark brown to yellowish, twigs brownish to yellowish; shrub or small tree along streams and other wet places.
ARROYO WILLOW, *S. lasiolepis*

S. hindsiana Benth.

SANDBAR WILLOW (fig. 114). Erect, deciduous shrub or small tree, to 7 m tall, with gray, furrowed bark; young stems with dense gray-woolly hair; leaves light green, simple, alternate, nearly linear, mostly 4 to 8 cm long, 0.2 to 1.6 cm wide, entire or with minute serrations or sometimes vaguely denticulate, mostly covered with gray, silky hairs, midvein with several laterals tending toward leaf tip; flowers, March to June, following leaf development in February and March; fruit, 2-valved, silky to nearly glabrous capsule, almost sessile. Similar shrubby species is narrowleaf willow, *S. exigua* Nutt., with leaves usually less hairy and greener above.

Distribution: Wet places, sandbars; common from Ventura to San Diego County, Baja California.

Fire Response Mechanism: Root-sprouts after fire, cuttings.

Wildlife Value: Staple browse for deer, preferred by livestock.



Figure 114-Sandbar willow, *Salix hindsiana* (McMinn 1939).

Cultural Value: Leaves and green bark probably ground and steeped in water for use as beverage to relieve colds, headaches, etc. Salicylic acid, an active ingredient of aspirin, first isolated in Europe from a *Salix*.

S. lasiolepis Benth.

ARROYO WILLOW (fig. 115). Erect, deciduous shrub or small tree, 2 to 10 m tall, smooth bark and yellowish to dark brown twigs; leaves simple, alternate, wider above the middle than below, oblanceolate or obovate, leaf size highly variable, 2 to 10 cm long, 0.6 to 3 cm wide, sometimes serrate, flat to rolled under at edges, green and hairless above, pubescent and white-filmy below; flowers, February to April (usually before, but sometimes coincidental with, leaf development) in slender, compact clusters (catkins), dark scales; fruit, 2-valved, glabrous or finely pubescent, pedicled capsule.

Distribution: Stream banks, sandbars, other wet places below 2100 m (7000 ft); many plant communities; throughout cis-montane California, occasional on desert side, north to Washington, and Idaho.

Fire Response Mechanism: Stump-sprouts and root-sprouts after fire, cutting.

Wildlife Value: Staple or preferred browse of deer, bighorn sheep, and beaver.

Cultural Value: Leaves ground and steeped for several hours; beverage used to relieve colds, headaches, and other pains.



Figure 115-Arroyo willows, *Salix lasiolepis* (McMinn 1939).

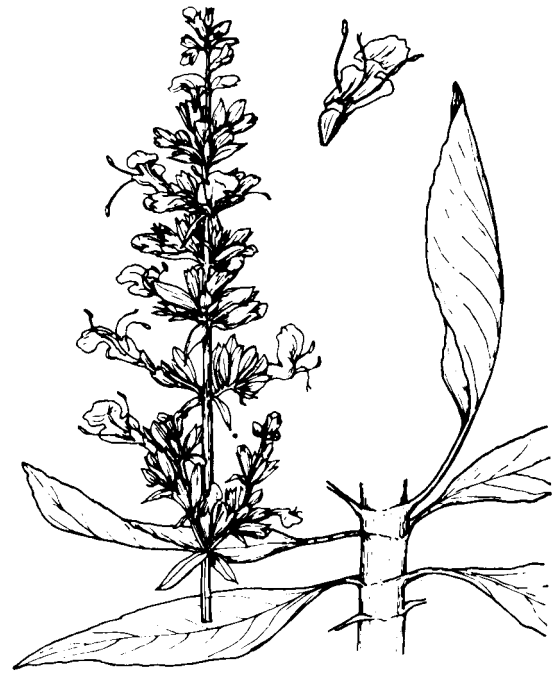


Figure 116-White sage, *Salvia apiana* (McMinn 1939).

Salvia spp. Mint-Family (*Lamiaceae*)

- 1a. Leaves green to grayish green, at least above.
- 2a. Leaves dark green and wrinkled above; shrub, foothills in coastal sage scrub to chamise chaparral.

BLACK SAGE, *S. mellifera*

- 2b. Leaves grayish green and wrinkled on both surfaces; occasional shrub in chamise chaparral and coastal sage scrub in San Diego County.

CLEVELAND SAGE, *S. clevelandii*

- 1b. Leaves and stems whitish gray.
- 2a. Plants generally coastal, below 600 m in coastal sage scrub. PURPLE SAGE, *S. leucophylla*
- 2b. Plants more interior, up to 1500 m in woodlands and sage scrub. WHITE SAGE, *S. apiana*

S. apiana Jeps.

WHITE SAGE (*fig. 116*). Subshrub, 1 to 2 m tall, very white on stems and leaves, long erect branches from base, young stems square; leaves simple, opposite, canescent, crowded at base of branches, lanceolate with some rounded teeth on leaf margins, 3 to 9 cm long, 1 to 3.5 cm wide, petioles variable, leaves appear white with fuzzy texture; flowers, March to July, white to pale lavender, blooms in whorls at leaf axils in terminal, few flowered racemes 50 to 150 cm long, pedicels 3 to 15 cm long on opposite sides of stems; fruit, 4 nutlets, 2.5 to 3 mm long, become separate at maturity.

Distribution: Widespread, mostly below 1500 m (5000 ft); yellow pine woodlands, sage scrub (soft chaparral), chamise chaparral; mountains of southern California to Colorado Desert, south to Baja California.

Fire Response Mechanism: Numerous root-sprouts and seedlings following fire.

Wildlife Value: Low value browse mostly by rodents. Seeds taken by birds and rodents. Flowers preferred by bees.

Cultural Value: Leaves used for tea, or in sweatshouses to remove body odors before a hunt. Elongating stalks can be peeled and eaten.

S. clevelandii (Gray) Greene

CLEVELAND SAGE (*fig. 117*). Sweetly fragrant low shrub, to 1 m tall, young stems square and tomentose; leaves grayish green covered with short hairs (canescent), somewhat wrinkled on both surfaces, dark green above, lighter below, elliptic-oblong with small rounded teeth on leaf margins, 1 to 5 cm long, 0.5 to 1.5 cm wide, petioles mostly 1 to 6 mm long; flowers, December through September, along elongated flowering stem in widely-spaced whorled clusters, blue violet to occasionally whitish; fruit, 4 nutlets, 1.5 to 2 mm long, becoming separate at maturity. Appears somewhat like *S. mellifera*, but with grayer foliage, and has characteristic sweet fragrance.



Figure 117-Cleveland sage, *Salvia clevelandii* (McMinn 1939).

Distribution: Below 1100 m (3000 ft); chamise chaparral to coastal sage scrub (soft chaparral); San Diego County to Baja California.

Fire Response Mechanism: Variable sprouter from roots and stems after cutting; rather flammable especially when flower stems mature and become dry.

Wildlife Value: Low value browse.

Cultural Value: Leaves excellent for tea or cooking.

S. leucophylla Greene

PURPLE SAGE (fig. 118). Much-branched shrub, 1 to 1.5 m tall, whitish stems, young stems square, reddish becoming gray with age; leaves opposite with several secondary leaves at primary leaf node, primary leaves ovate to almost lance-shaped, 6 or 7 cm long, 0.5 to 2.5 cm wide, petioles (if present) 3 to 8 mm long, leaves with rounded teeth on margins, grayish green above with rough, wrinkled surface, paler and white, fuzzy below; flowers, April to June, lavender, 3 to 5 compact, whorled clusters on elongated flowering stems; fruit, 4 nutlets, 3 to 4 mm long, separates at maturity.

Distribution: Coastal mountains below 600 m (2000 ft); coastal sage scrub (soft chaparral); Orange County (Santiago Canyon), north to San Luis Obispo County.

Fire Response Mechanism: Root-sprouts after fire, cutting; rather flammable, especially when flower stems mature and become dry.

Wildlife Value: Low value browse; seeds eaten by birds.

Cultural Value: Can be used to make pleasant herb tea.

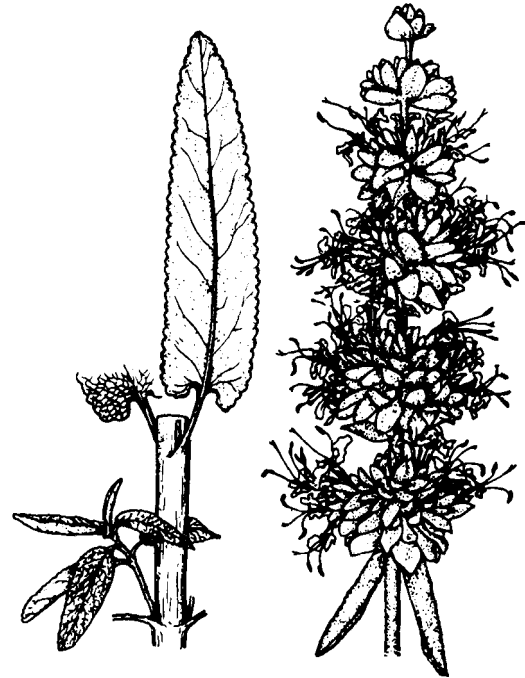


Figure 118-Purple sage, *Salvia leucophylla* (McMinn 1939).

S. mellifera Greene

BLACK SAGE (fig. 119). Shrub, 1 to 2 m tall, young stems square, hairy, sometimes purple, commonly greenish, become brownish gray with age; leaves simple, opposite, mostly elliptic to oblong, dark green with many small crenate (rounded teeth) margins, wrinkled above, lighter to ash-colored below and covered with short hairs (canescent), 2 to 6 cm long, less than 1.5 cm wide, petioles (if present) 10 to 12 mm long; flowers, March to June, pale blue to whitish, 2-lipped, compact whorls, spaced along elongated stem; fruit, 4 nutlets about 2 mm long, separates at maturity.

Distribution: Foothills below 900 m (3000 ft); coastal sage scrub (soft chaparral) to chamise chaparral; Contra Costa County, Mt. Diablo, south to Baja California.

Fire Response Mechanism: Rather flammable, especially when flower stems mature and become dry; many root-sprouts and seedlings after fire.

Wildlife Value: Browsed by rodents, low value; seeds staple of birds, small mammals; flowers preferred by honey bees.

Cultural Value: Seeds parched and ground into meal. Leaves and stalks used as condiment.

Sambucus mexicana Presl.

Honeysuckle Family (*Caprifoliaceae*)

MEXICAN ELDERBERRY (fig. 120). Tall shrub or small tree, 2 to 8 m tall, young stems reddish becoming brown, old bark heavily ridged, thick and grayish; leaves opposite, compound, divided into 3 or more (commonly 5, sometimes 7)



Figure 119-Black sage, *Salvia mellifera* (inset, Munz 1974).

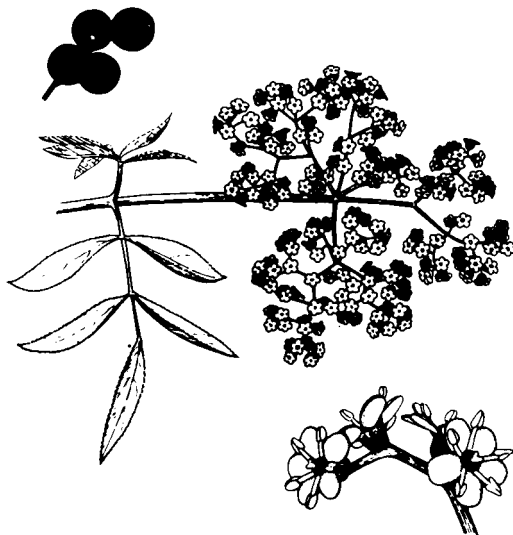


Figure 120-Mexican elderberry, *Sambucus mexicana* (Munz 1974).

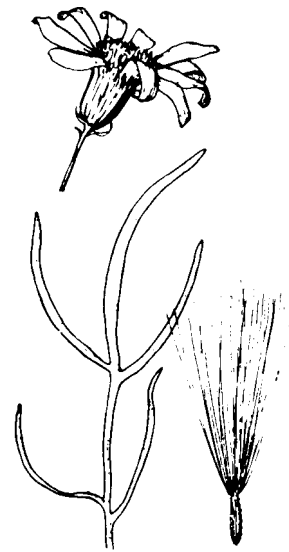


Figure 121-Bush groundsel, *Senecio douglasii* (McMinn 1939).

leaflets, terminal leaflet 4 to 14 cm long, 2 to 5 cm wide, leaflets ovate to obovate, finely serrate and pubescent to glabrous; flowers, April through July, small blooms with five dull white petals in flat-topped spreading cluster, 4 to 10 cm across; fruit, bluish drupe about 5 mm across, white filmy covering. Blue elderberry (*S. coerulea* Raf.) occurs at higher elevations to 3000 m (10,000 ft), 5 to 9 leaflets, better flavored berries.

Distribution: Common in canyons and valleys, below 1700 m (5600 ft); many plant communities; Lake and Glenn Counties, south to Baja California, and Arizona.

Fire Response Mechanism: Stump-sprouts after fire.

Wildlife Value: Staple browse plant; fruits preferred by birds, small mammals, rodents.

Cultural Value: Flower clusters dried, preserved, and later cooked to make sweet sauce. Berries eaten fresh or stored, used to make purple black dye. Stems used to make yellow or orange dye. Native Americans made flutes from branches and arrow shafts from straight stems (Sweet 1962).

Senecio douglasii DC. Sunflower Family (*Asteraceae*)
 BUSH GROUNDSEL (fig. 121). Straggly or straight branched subshrub, 1 to 1.6 m tall, leafy up to flowers, young stems light green and tomentose becoming less tomentose and brown with age, mature bark gray, stems marked with longitudinal lines or furrows; leaves 3 to 10 cm long, linear, filiform or divided into 5 to 9 linear lobes, upper leaves commonly 3-lobbed or entire, leaf divisions usually deep enough to make

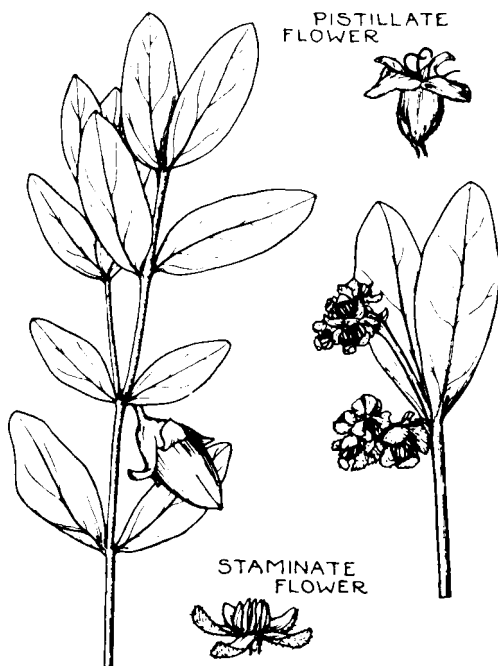


Figure 122-Jojoba (goatnut), *Simmondsia chinensis* (McMinn 1939)

leaf appear compound, divisions flattened and near filiform, gray green above, whitish fuzz below; flowers, April through November, several to many showy, yellow heads with 10 to 13 rays, 10 to 15 mm long; fruit, hairy akene about 4 mm long. Munz (1974) recognizes *S. spartioides* T. & G. as species of higher elevation, 2400 to 3200 m (8000-10,500 ft). This species grows from a heavy woody base (caudex), stems leafy up to flowers. Leaves mostly linear, entire, and glabrous, 3 to 10 cm long, 1.5 to 5 mm wide; flowers approximately same as above, blooming more pronounced mid-summer.

Distribution: Common in washes, dry hillsides, below 1800 m (6000 ft); coastal sage scrub (soft chaparral) to scrub oak chaparral; coast ranges, Mendocino County to Baja California.

Fire Response Mechanism: Information not available.

Wildlife Value: Low value.

Cultural Value: None known.

Simmondsia chinensis (Link) Schneider.

Box Family (*Simmondsiaceae* formerly *Buxaceae* [Munz 1974])

JOJOBA (GOATNUT) (fig. 122). Rigid, spreading dioecious evergreen shrub, 1 to 2 m tall, young stems densely pubescent and green becoming gray; leaves leathery, simple, opposite, approximately ovate, 2 to 5 cm long, 1.0 to 2.5 cm wide, petiole very short or absent, leaf surfaces about equally covered with fine pubescence, pale green or yellowish, 1- to 3-veined from base; flowers, March to May, male and female

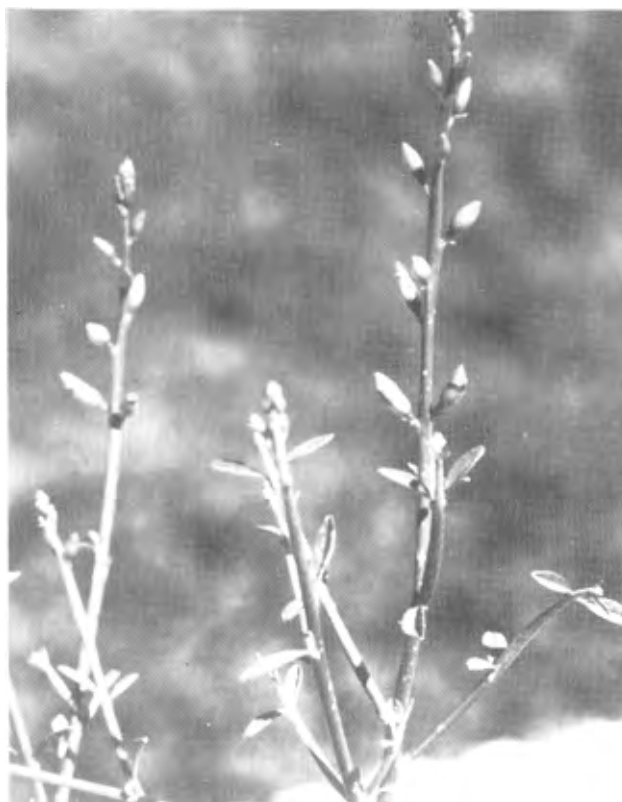


Figure 123-Spanish broom, *Spartium junceum*.

flowers on separate plants, pale green or yellowish, 3 to 4 mm long with sepals only, female flowers become 10 to 20 mm long as fruit develops; fruit, smooth cylindrical capsule about 2 cm long, resembling an acorn.

Distribution: Dry barren slopes, below 1500 m (5000 ft); creosote bush, Joshua tree woodland; Little San Bernardino Mountains, west to Riverside, San Diego Counties to Baja California.

Fire Response Mechanism: Information not available.

Wildlife Value: Fruits staple for small mammals, birds. Leaves and twigs staple browse for livestock.

Cultural Value: Seeds eaten fresh or ground and mixed with water for coffee-like beverage (Clarke 1977). Oil from nut has considerable commercial value as whale oil substitute.

Spartium, junceum L.

Pea Family (*Fabaceae*)

SPANISH BROOM (fig. 123). Tall broom-like drought deciduous shrub, to 3 m tall, stems green becoming gray at base often nearly leafless; leaves (when present) green, simple, alternate, entire and glabrous, oblong-oblongate, 1 to 3 cm long, 2 to 6 mm wide; flowers, April to June, bright yellow, 2 to 2.5 cm long, fragrant, terminal clusters on straight green stems; fruit, pod 5 to 10 cm long.

Distribution: Frequent escapee from cultivation or planted along roadsides below 2100 m (7000 ft).

Fire Response Mechanism: Information not available.

Wildlife Value: Not used.

Cultural Value: Introduced.



Figure 124-Storax, *Styra officinalis* var. *fulvescens* (Munz 1974).

Storax officinalis L. var. *fulvescens* (Eastw.) M. & J.

Storax Family (*Styracaceae*)

STORAX (fig. 124). Erect, deciduous shrub to 4 m tall with grayish twigs, young stems pubescent; leaves 2 to 9 cm long, 1.5 to 7 cm wide, upper surface pubescent, rather short brownish matted hair below, roundish (round-ovate to obovate), obtuse or subcordate base, obtuse to rounded apex, petioles to 10 mm long; flowers, April to May, terminal clusters of white blossoms with 4- to 10-lobed corolla, 12 to 18 mm long, persistent, unequally toothed calyx on flowering branchlets, peduncles 6 to 12 mm long; fruit, globose-oval seed about 12 to 14 mm long.

Distribution: On slopes and in canyons to 1500 m (5000 ft); chaparral and southern oak woodlands from San Luis Obispo south to San Diego.

Fire Response Mechanism: Not known.

Wildlife Value: Unknown.

Cultural Value: None known.

Symphoricarpos mollis Nutt.

Honeysuckle Family (*Caprifoliaceae*)

SPREADING SNOWBERRY (fig. 125). Low sprawling, deciduous shrub, stems to 90 cm long, twigs reddish, usually with dense short, curved hairs; leaves opposite, grayish green to light green, oval to nearly ovate, usually entire, rarely lobed, short pubescence above and densely pubescent with whitish appearance beneath, 1 to 4 cm long, 0.7 to 3 cm wide; flowers, March through August, short clusters or pairs, corolla lobes pink, bell shaped, 3 to 5 mm long, lobes 2 to 3

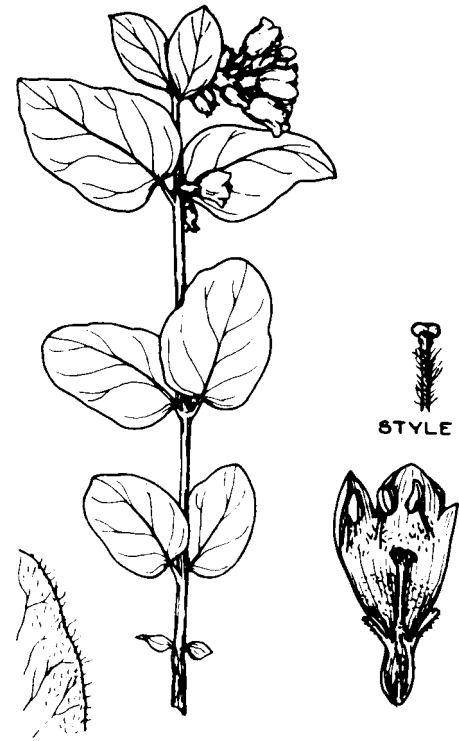


Figure 125-Spreading snowberry, *Symphoricarpos mollis* (McMinn 1939).

mm long; fruit, white berry-like drupe (hence the name snowberry).

Distribution: Shaded slopes, below 900 m (3000 ft), sometimes to 1500 m (5000 ft); oak woodland, conifer forest, chaparral, scrub oak chaparral; coast ranges, Mendocino County to Baja California. Similar species, **MOUNTAIN SNOWBERRY**, *S. parishii*, Rydb., funnel-shaped, white yellow to pink flower; leaves thicker than *S. mollis*, grayish green on both surfaces; occurs at higher elevations 1500 to 3400 m (5000-11,000 ft) throughout San Bernardino National Forest to Humboldt County.

Fire Response Mechanism: Sometimes roots at branchlet tips; stump sprouts after fire.

Wildlife Value: Staple or preferred browse for deer, preferred browse of cattle and sheep. Honey bees use flowers.

Cultural Value: Leaves contain saponin, possibly in poisonous amounts; Native Americans used portions of roots and fruits for medicinal purposes (Sweet 1962).

Tetradymia comosa Gray.

Sunflower Family (*Asteraceae*)

HAIRY HORSEBRUSH (fig. 126). Erect bush, 0.5 to 1.2 m tall, white fuzzy (tomentose) branchlets, light gray, darkening to dark gray with patches of fuzzy scales; tomentose leaves, simple, entire, alternate, whitish, linear, 2.5 to 5 cm long, to 2 mm wide, early leaves flexible, later become rigid and spine-tipped, sometimes short leaves in fascicle with principle leaves; flowers, June to September, heads of 6 to 10 tube flowers (no ray flowers) subtended by 5 to 6 woolly bracts; fruit, akene covered with long, woolly hairs.



Figure 126-Hairy horsebrush, *Tetradymia comosa* (McMinn 1939).

Distribution: Dry places usually on interior mountain slopes, below 1500 m (5000 ft); coastal sage scrub (soft chaparral), chaparral and many other shrub plant communities; southern California, north to Newhall, occasional in Mojave Desert.

Fire Response Mechanism: Stump-sprouts after fire.

Wildlife Value: Low value.

Cultural Value: None known.

Toxicodendron diversilobum Greene.

Sumac Family (*Anacardiaceae*)

POISON-OAK (fig. 127). Erect or spreading deciduous shrub, 1 to 3 m tall, young stems olive green to reddish becoming dark brown and somewhat shreddy; leaves 3-foliate, divisions with rounded serration or lobed, ovate to round in outline, leaflets 2 to 7 cm long, 1 to 5 cm wide, leaves bright green and shiny above, paler below, leaflets glabrous to more or less pubescent on veins, new leaves usually red; flowers, March through June, small, greenish white blossoms in drooping clusters from leaf axils; fruit, white or brownish, berry-like drupe.

Distribution: Low places, thickets, stream banks, below 1500 m (5000 ft); many plant communities; Baja California north to Oregon and Washington.

Fire Response Mechanism: Root-sprouts.

Wildlife Value: Fair to poor browse for deer and livestock

Cultural Value: Oils from this species cause most people to break out with minor to serious allergic skin rash and swelling, may be more serious if taken internally. Reputedly,

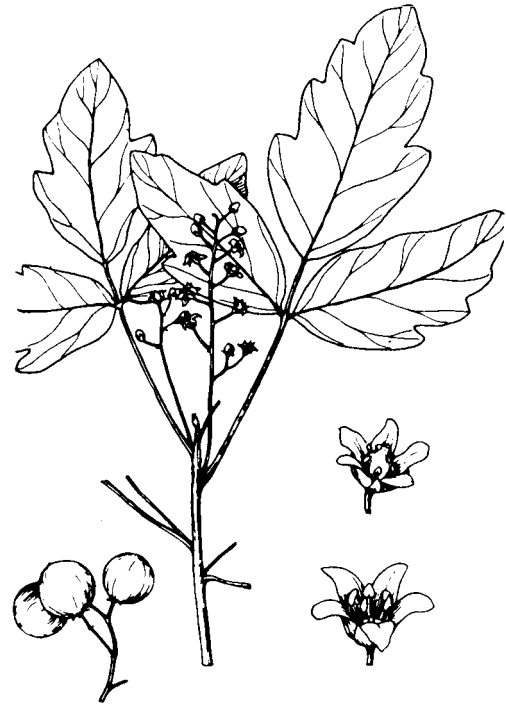


Figure 127-Poison-oak, *Toxicodendron diversilobum* (McMinn 1939).

Native Americans were not allergic to the plant and used sap for black dye in basketry.

Trichostema lanatum Benth. Mint Family (*Lamiaceae*)
WOOLLY BLUE CURLS (fig. 128). Small rounded evergreen largely woody subshrub, 0.5 to 1.5 m tall, young stems square, hairy and reddish becoming brown and less hairy, mature stems with shreddy bark; leaves lance-linear, 3.5 to 7.5 cm long, 1 to 6 mm wide, rolled under at edges, green above, white and fuzzy below, bundles of small leaves in axils of larger opposite pairs; flowers, April to August, short clusters from leaf axils along upper stems, blooms are irregular, blue and fuzzy with long stamens extending beyond corolla, blooms more or less covered with bluish pink to nearly white hairs; fruit, 4 nutlets, joined at base, roughened with prominent veins and short stiff hair.

Distribution: Dry slopes of coastal mountains, below 1400 m (4500 ft); San Diego to Monterey Counties.

Fire Response Mechanism: Sprouting ability unknown, numerous seedlings after fire.

Wildlife Value: Low value; honey bees use flowers.

Cultural Value: Leaves and flowers boiled for tea to relieve stomach ailments and for various uses (Sweet 1962).

Turricula parryi (Gray) Macbr.

Waterleaf Family (*Hydrophyllaceae*)

POODLE-DOG BUSH (fig. 129). Coarse evergreen subshrub 1 to 2.5 m tall, glandular-hairy purplish stems becom-



Figure 128-Woolly blue curls, *Trichostema lanatum* (McMinn 1939).

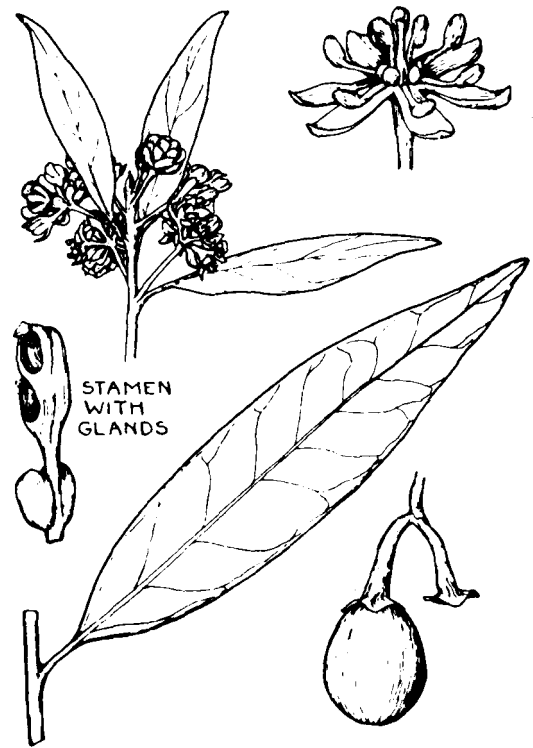


Figure 130-California bay (laurel), *Umbellularia californica* (McMinn 1939).



Figure 129-Poodle-dog bush, *Turricula parryi* (McMinn 1939).

ing brown at base, sticky, ill-smelling herbage, drooping and brown with age, appearing like shaggy poodle heads; leaves alternate, pubescent or hirsute, crowded, 5 to 20 cm long, 1 to 2.5 cm wide, toothed or entire, without petioles; flowers, June to August, numerous in a scorpioid raceme, coiled fiddle-neck cluster commonly more than 10 cm long, individual flowers purple, tubular and pubescent, 13 to 18 mm long; fruit, membranous capsule. Plants may be mostly herbaceous.

Distribution: Occasional in dry disturbed places, 300 to 2400 m (1000-8000 ft); chaparral to yellow pine communities; Fresno, Kern Counties, Sierra Nevada to Baja California. *Fire Response Mechanism:* Nonsprouter, profuse seedlings on burns.

Wildlife Value: Low value, insects use flowers.

Cultural Value: None known; contact with this plant causes some people to have dermatitis.

Umbellularia californica (H. & A.) Nutt.

Laurel Family (*Lauraceae*)

CALIFORNIA BAY (LAUREL) (fig. 130). Normally an evergreen tree to 30 m tall or large erect shrub on exposed slopes and in chaparral, young stems with green bark turning brown with age; leaves entire, simple, alternate, shiny, lance-shaped or oblong, 3 to 10 cm long, 1.5 to 4 cm wide, pungent odor when crushed; flowers, January through June, small, greenish yellow, 4- to 10-flowered clusters; fruit greenish to dark purple round-ovoid drupe, 2 to 2.5 cm long containing hard stone.

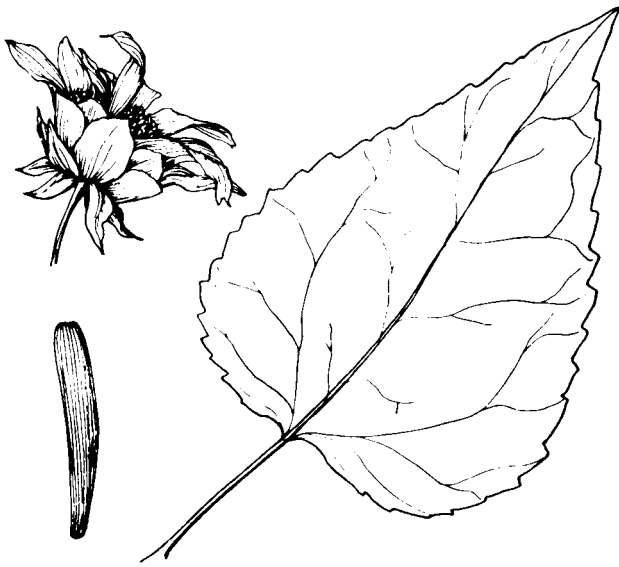


Figure 131-Canyon sunflower, *Venegasia carpesioides* (McMinn 1939).

Distribution: Common in canyons, shaded slopes; many plant communities from mesic chaparral to dense woodlands; mostly below 1500 m (5000 ft); San Diego County to southwest Oregon.

Fire Response Mechanism: Vigorous stump and crown sprouts after fire, cutting.

Wildlife Value: Low value browse. Fruits eaten by Steller's jays and similar birds.

Cultural Value: Leaves can be dried and used as condiment. Inhaling too much of aromatic leaves can cause headaches. Native Americans used leaves to cure headaches by placing piece of leaf in nostril and binding several leaves to forehead (Clarke 1977).

Venegasia carpesioides DC. Sunflower Family (*Asteraceae*)
CANYON SUNFLOWER (fig. 131). Erect perennial herbs from a woody base, to 2.5 m tall, young stems purplish to brown becoming more definitely brown with age, stem has pith center, stems and leaves sparingly pubescent; leaves, thin, alternate and simple, 3 to 15 cm long, 1.5 to 12 cm wide, large serrations, notched at base and somewhat heart-shaped, sometimes lobed, usually darker green above; flowers, March through August, blooms are large heads with 13 to 20 yellow female ray-flowers, 15 to 20 mm long, many male tube flowers; fruit, akene.

Distribution: Shaded canyon walls, coastal to 800 m (2700 ft); coastal sage scrub (soft chaparral), scrub oak chaparral; Monterey County, south to San Diego, and Baja California.



Figure 132-San Diego sunflower, *Viguiera laciniata* (McMinn 1939).

Fire Response Mechanism: Seedlings.

Wildlife Value: Birds like seeds.

Cultural Value: None known.

Viguiera laciniata Gray Sunflower Family (*Asteraceae*)
SAN DIEGO SUNFLOWER (fig. 132). Rounded subshrub, 1 to 2 m tall, more or less resinous with tough feeling surfaces, much-branched, slender rough pubescent and more or less brittle stems, young stems greenish, bark becoming brown with age; leaves simple, at least lower ones opposite, 2 to 5 cm long, to 1.5 cm wide, lance-shaped, often with an abrupt base, margins serrated, thick and leathery, darker green above with sparse short, sometimes recurved hairs especially on veins; flowers, February to June, blooms in heads with 8 to 13 rays, 10 to 15 mm long, many tube flowers; fruit, laterally compressed akene.

Distribution: Dry slopes, to 800 m (2500 ft); chamise chaparral, coastal sage scrub (soft chaparral); southwest San Diego County to Baja California.

Fire Response Mechanism: Unknown.

Wildlife Value: Low value browse.

Cultural Value: None known.

Vitis girdiana Munson. Grape Family (*Vitaceae*)
DESERT WILD GRAPE (fig. 133). Deciduous shrub with trailing tendril bearing stems climbing over and supported by other plants or may be bush-like, young stems with some hairiness becoming brown with age; leaves, simple, alternate,

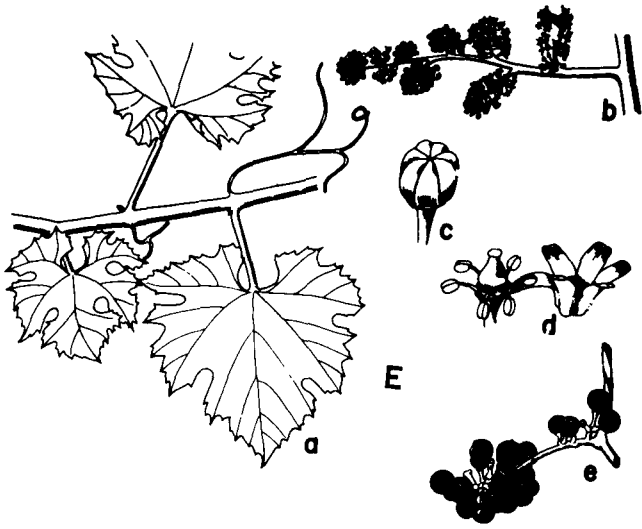


Figure 133-Desert wild grape, *Vitis girdiana*: (a) vegetative branch, (b) fruiting branch, (c) bud, (d) flower, (e) fruit (Munz 1974).

green to light green, darker above, 3 or 5 veins from heart-shaped base, ovate, in outline but tips tend to be triangular, lobed and coarsely serrate, with cobwebby hairs beneath, 5 to 10 cm long, 5 to 16 cm wide, petioles 3 to 5 cm long; flowers, May and June, small, fragrant, greenish blossoms in racemes to 12 cm long; fruit, smooth, blackish berry, 3 to 6 mm diameter.

Distribution: Along streams, canyon bottoms below 1200 m (4000 ft); scrub oak chaparral, live oak woodland, coastal sage scrub (soft chaparral); Inyo and Santa Barbara Counties, south to Baja California.

Fire Response Mechanism: Information not available, probably root sprouts if not too severely burned.

Wildlife Value: Berries staple for birds and animals.

Cultural Value: Native Americans ate berries raw or dried and stored them. Juice of grape leaves used to treat diarrhea and lust in women (Clarke 1977).

Xylococcus bicolor Nutt. Heath Family (*Ericaceae*)
MISSION MANZANITA (fig. 134). Erect evergreen shrub to 3 m tall, shredded reddish to graybrown bark; leaves lanceolate to ovate or obovate, alternate, dark green and shiny above, often with obvious vein indentations, whitish and pubescent to tomentose below, thick and leathery, involute or at least rolled under at margins, tapering at both ends, 3 to 6 cm long, 1 to 2 cm wide, petiole 0.5 to 1 cm long; flowers, December to March, white or pink urn-shaped blossoms, 8 to 9 mm long; fruit, black or reddish dry drupe, 5 to 8 mm diameter, containing hard stone.

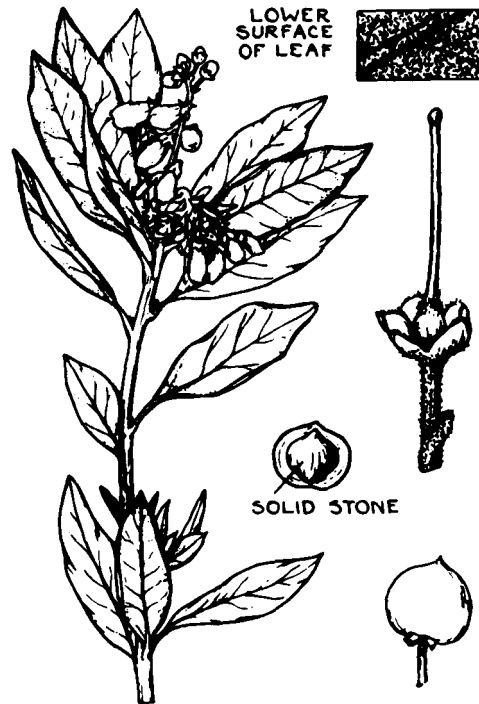


Figure 134-Mission-manzanita, *Xylococcus bicolor* (McMinn 1939).

Distribution: Below 600 m (2000 ft); chamise chaparral and ceanothus chaparral; west San Diego County to Baja California.

Fire Response Mechanism: Stump or crown sprouts after fire, cutting.

Wildlife Value: Low value browse and fruit.

Cultural Value: None known.

Yucca spp. Agave Family (*Agavaceae*)
1a. Leaves gray green, with sharp, black spine at the tips, never with stringy edges; common in dry coastal sage scrub, chaparral, creosote bush between 300 and 2400 m.
CHAPARRAL YUCCA, *Y. whipplei*
1b. Leaves with stringy edges; occasional on dry inland slopes on both sides of the mountains below 1500 m.
SPANISH BAYONET, *Y. schidigera*

Y. schidigera Roez ex. Ortgies
SPANISH DAGGER (fig. 135). Stiff leaved, robust plant with short trunk; leaves concave or flattened, green to greenish yellow with brown tip, to 1 m long, 2 to 6 cm wide, sharp-pointed spine tip, stringy edges; flowers, March to June, on extended stalk to 30 cm long (short compared with *Y. whipplei*), blossoms whitish with purple tinge, bell-shaped,

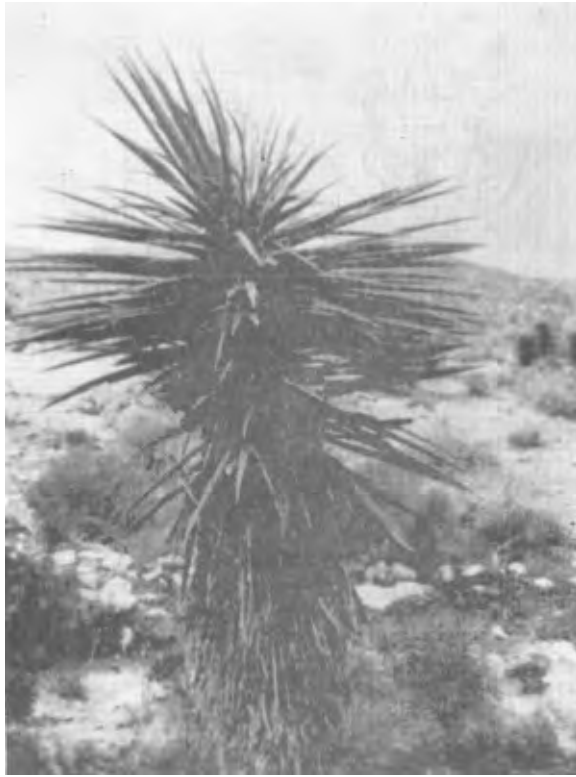


Figure 135-Spanish dagger, *Yucca schidigera*.

to 4 cm long; fruit, capsule to 11 cm long, 4 cm wide. Pollination done only by yucca moth (*Pronuba* sp.).

Distribution: Dry rocky slopes, below 1500 m (5000 ft); both sides of southern California mountains, Mojave Desert, San Bernardino Valley, San Jacinto, Santa Rosa Mountains south to San Diego, and Baja California. On desert side, Joshua Tree, *Y. brevifolia* Engelm. in Wats., root-sprouts after fire and may appear shrubby at that time.

Fire Response Mechanism: Root-sprouts after fire, cutting.

Wildlife Value: Low value browse. Indicator of severe range problems if used by cattle.

Cultural Value: Fruits of chaparral yucca edible. Leaves used for cordage, leaf tips could be used as a needle.

Y. whipplei Torr.

CHAPARRAL YUCCA (OUR LORD'S CANDLE) (fig. 136). A stiff-leaved robust plant, apparently stemless, has tall flower stalk with massive fruiting panicle; leaves all basal, bright green to gray green with brown spine tip, 0.3 to 1 m long, 0.8 to 1.0 cm wide, more or less flattened or concave, rigid, slender terminal spine 1 to 2 cm long; flower stalk sprouting from base, to 2.5 m tall, flowers, April and May, cream white, or tinged purple, open bell-shaped, 2 to 4 cm long; fruit, capsule about 4 cm long and 3 cm across. After fruiting is complete, entire aerial part of plant dies and regeneration may occur from seed or short rhizomes or stolons. Pollination only by small yucca moth (*Pronuba* sp.).



Figure 136-Chaparral yucca, *Yucca whipplei*.

Distribution: Dry slopes, 300 to 2400 m (1000 to 8000 ft); coastal sage scrub (soft chaparral), creosote bush, manzanita, to chamise chaparral; Monterey County, southern Sierra Nevadas to southern California.

Fire Response Mechanism: Basal resprouts if not too severely burned and a burned stand frequently produces a profusion of flowers in a year or two after fire.

Wildlife Value: Low value browse, fruits eaten by birds and insects.

Cultural Value: Fruits and flowers edible (Clarke 1977).

REFERENCES

- Abrams, LeRoy. **Illustrated flora of the Pacific States**. 4 v. Palo Alto, CA: Stanford Univ. Press; 1960. 2791 p.
- Balls, Edward K. **Early uses of California plants**. Berkeley: Univ. of California Press; 1972. 103 p.
- Clarke, Charlotte Bringle. **Edible and useful plants of California**. Berkeley: Univ. of California Press; 1977. 280 p.
- Collins, Barbara J. **Key to coastal and chaparral flowering plants of southern California**. Northridge, CA: California Lutheran College; 1974a. 249 p.
- Collins, Barbara J. **Key to trees and wildflowers of the mountains of southern California**. Northridge, CA: California Lutheran College; 1974b. 277 p.

- Hanes, Ted L. **Ecological studies on two closely related chaparral shrubs in southern California**. Ecological Monographs 35(2):213-235; 1965 Spring.
- Martin, A. C.; Zim, H. S.; Nelson, A. L. **American wildlife and plants; a guide to wildlife food habits**. New York: Dover Publ., Inc.; 1951. 500 p.
- McMinn, Howard E. **An illustrated manual of California shrubs**. Berkeley: Univ. of California Press; 1939. 663 p.
- Medsger, Oliver Perry. **Edible wild plants**. New York: Collier MacMillan Publishers; 1966. 323 p.
- Munz, Philip A. **A flora of southern California**. Berkeley: Univ. of California Press; 1974. 1086 p.
- Munz, Philip A.; Keck, David. **A California flora and supplement**. Berkeley: Univ. of California Press; 1970. 1681 p.
- Raven, Peter H. **Native shrubs of southern California**. Berkeley: Univ. of California Press; 1966. 132 p.
- Smith, Clifton F. **A flora of the Santa Barbara region**. Santa Barbara: Santa Barbara Museum of Natural History; 1976. 331 p.
- Stebbins, G. L.; Major, J. **Endemism and speciation flora**. Ecological Monographs 35(1):1-35; 1965 Winter.
- Sweet, Muriel. **Common edible and useful plants of the west**. Healdsburg, CA: Naturegraph Co.; 1962. 64 p.
- U.S. Department of Agriculture, Forest Service. **Range analysis**. FSH 2209.21. San Francisco: Div. Range and Wildlife Manage., California Region, Forest Service, U.S. Department of Agriculture; 1969 [Loose leaf, updated].
- Van Dersal, William R. **Native woody plants of the United States**. Misc. Publ. No. 303. Washington, DC.; U.S. Department of Agriculture; 1938. 362 p.

APPENDIX A

Southern California Shrub and Subshrub Vegetation Excluding Desert Genera¹

Family / genus	Common name	Total		Chaparral		Shrubs and subshrubs			
				Shrubs	Sub-shrubs	Elevation ranges (meters) ³	Major aspect ⁴	Geo graphic zone ⁵	Typical vegetation types ⁶
		Genera	Species						
<i>Aceraceae</i>	Maple family	1							
<i>Acer</i>	Maple		3	1	0	<2000-2700	MONT, TRANS	SJ, SB, HD	MCF, MCW
<i>Agavaceae</i>	Agave family	3							
<i>Yucca</i>	Yucca ²		4	2	0	<2400	TRANS	FH, DC	C, CSS, CBS
<i>Aizoaceae</i>	Carpet-weed family	11							
<i>Aptena</i>			1	0	1	<150	CST	CST, I	INTRO
<i>Carpobrotus</i>	False-fig		2	0	2	<150	CST	CST	CS, CSS, INTRO
<i>Drosanthemum</i>			2	0	2	<500	CST	CST	INTRO
<i>Anacardiaceae</i>	Sumac family	3							
<i>Rhus</i>	Sumac ²		4	4	0	<1700	CIS	CST-FH	C, CSS, OW
<i>Toxicodendron</i>	Poison-oak ²		1	1	0	<1500	CIS	CST-FH	C, CSS, OW, WW
<i>Asclepidaceae</i>	Milkweed family	5							
<i>Sarcostemma</i>			2	0	1	<600	CST, TRANS	CST, D	CSS, C, CBS
<i>Asteraceae</i>	Sunflower family	149							
<i>Ambrosia</i>	Bursage		10	1	1	<300	CIS	CST	CSS, C
<i>Artemisia</i>	Sagebrush ²		13	4	1	<900 (500-3200)	CIS, TRANS	CST, MTS, D	CSS, SGS, W, C, CF
<i>Aster</i>	Aster		15	0	2	<1100	CIS, TRANS	CST-LD AS,	CSS, CBS
<i>Baccharis</i>	Baccharis ²		8	5	1	<1100	CIS, TRANS	CST-FH	CSS, WW, CBS, C, CS, CSM
<i>Bebbia</i>	Sweet Bush		1	0	1	<1200	CST, TRANS	CST, D	CBS, CSS
<i>Brickellia</i>	Brickellbush ²		12	2	1	<2300	CIS, TRANS	CST-D	CBS, CSS, PJ, C, JTW
<i>Chaenactis</i>			10	0	1	1500-2100	CIS	SJ, SR	C, YPF
<i>Chrysopsis</i>	Golden-aster		2	0	1	UND	UND	SB-SN	RARE OR EXTINCT
<i>Chrysothamnus</i>	Rabbit-brush ²		7	1	1	1200-3400	TRANS, CIS	MP	CW, MC, SGS, PJ
<i>Coreopsis</i>	Coreopsis (Tickseed)		7	1	0	<100	CST	CS, CSS	
<i>Corethrogyne</i>	Cudweed-Aster		1	0	1	150	CST	CST	CSS
<i>Encelia</i>	Encelia ²		4	0	3	<1200	CIS, TRANS	CST-FH-D	CBS, CSS, C
<i>Eriophyllum</i>	Golden-yarrow		10	0	3	<150	CST	CST-FH, I, MTS	CSS, CS, C
<i>Gutierrezia</i>	Matchweed		3	0	1	<1100	CIS, TRANS	FH	C, VG, CSS
<i>Haplopappus</i>	Goldenbush ²		25	11	2	<2100	CST, CIS, TRANS	FH, CST, I, MTS	CSS, C, CS, CBS, C, CSS
<i>Hemizonia</i>	Tarweed		15	2	0	<200	CST	I, CST	C, CSS
<i>Hymenoclea</i>	Burrobrush		2	1	0	<550	CIS	FH, CW	C, CSS
<i>Iva</i>	Poverty weed		3	0	2	<2000/<300	CIS, TRANS	CST, D	AS, CSM
<i>Lepidospartum</i>	Scale-broom ²		2	1	0	<1500	CST, TRANS	CST-FH-D	SS, C, JTW
<i>Malacothrix</i>	Cliff-aster		11	0	2	<600	CST, CIS	CST-FH	CSS, CS
<i>Munzothamnus</i>			1	1	0	<200	I	I	CSS
<i>Pulchea</i>	Arrowweed		2	1	0	<300	CST, TRANS	CST-FH	CSS, CBS, WW

Southern California Shrub and Subshrub Vegetation Excluding Desert Genera¹

Family/ genus	Common name	Total		Chaparral		Elevation ranges (meters) ³	Shrubs and subshrubs		
		Genera	Species	Shrubs	Sub-shrubs		Major aspect ⁴	Geo-graphic zone ⁵	Typical vegetation types ⁶
<i>Porophyllum</i>	Poreleaf		1	0	1	60-1500	CIS, TRANS	CST-FH-D	CBS, CSS
<i>Santolina</i>	Lavender-Cotton		1	1	0	<100	CST	CST	INTRO
<i>Senecio</i>	Senecio ²		17	0	2	<1800	CIS	CST-FH, 1	CSS, C, VG, FHW
<i>Stephanomera</i>	Tejon Milk-Aster		6	0	1	<1800	CIS	SB, SA	C, YPF
<i>Tetradymia</i>	Horsebrush ²		7	1	0	<1500	CIS, TRANS	FH, SB, SG	CSS, C
<i>Vengasia</i>	Canyon-sunflower ²		1	0	1	<800	CST	FH-CST	CSS, C, OW
<i>Viguiera</i>	Desert-sunflower ²		4	0	2	<1500	D, CST	D-CST	CBS, C, CSS
<i>Batidaceae</i>	Batis family	1							
<i>Batis</i>	Saltwort		1	0	1	<150	CST	CST	CS, CSM
<i>Berberidaceae</i>	Barberry family		1						
<i>Berberis</i>	Barberry ²		7	5	0	600-2000 (<600)	CIS g	MTS, FH	C, CSS, PJ, CF, CW
<i>Bignoniaceae</i>	Bignonia family	1							
<i>Chilopsis</i>	Desert-willow		1	1	0	<1500	TRANS	FH-D	C, CBS, JTW
<i>Brassicaceae</i>	Mustard family	38							
<i>Erysimum</i>	Wallflower		5	0	2	<150	CST	CST, I	CS
<i>Cactaceae</i>	Cactus family	10							
<i>Bergerocactus</i>			1	0	1	<150	CST	CST, I	CSS
<i>Echinocereus</i>	Hedgehog cactus		2	0	1	1500-2100	MONT	SB, SJ, D	PJ, YPF
<i>Ferocactus</i>	Barrel cactus		2	1	0	<300	CIS	FH	CSS, VG
<i>Opuntia</i>	Prickly-Pear		21	8	0	<1800	CST, CIS	CST, FH	C, CSS, YPF, VG
<i>Capparidaceae</i>	Caper family	5							
<i>Isomeris</i>	Bladderpod ²		1	1	0	<1200	CST, TRANS	I, CST, D	CBS, JTW, CSS
<i>Caprifoliaceae</i>	Honeysuckle family	3							
<i>Lonicera</i>	Honeysuckle ²		5	5	0	<900 (<1800)	CST, MONT, CIS	G	C, W, YPF, WW, CS
<i>Sambucus</i>	Elderberry ²		3	3	0	<1800 (3000)	CIS, MONT, TRANS	MTS, G	MC, CSS, C, OW, SF
<i>Symphoricarpos</i>	Snowberry ²		3	3	0	1200-3300 (<1500)	CIS, MONT, TRANS	MTS	PJ, BCPF, C, OW, SF
<i>Celastraceae</i>	Staff-tree family	3							
<i>Euonymus</i>	Burning Bush ²		1	1	0	300-2000	CIS, MONT	SJ-PM, CM	YPF
<i>Chenopodiaceae</i>	Goosefoot family	18							
<i>Atriplex</i>	Saltbush ²		25	4	4	<500 (<2200)	CST, CIS, TRANS	CST, I, D	VG, CSS, CS, CSM, AS, PJ
<i>Eurotia</i>	Winter fat ²		1	1	0	<600	TRANS	HD, SB, SN, SR	CBS, PJ
<i>Salicornia</i>	Pickleweed		5	0	1	<500	CST	CST, CSM, I	CSM
<i>Suaeda</i>	Seep-weed		4	0	3	<1500	CST, CIS, TRANS	CST, MTS, D	CSS, CBS, AS, CSM

Southern California Shrub and Subshrub Vegetation Excluding Desert Genera¹

Family/genus	Common name	Total		Chaparral		Shrubs and subshrubs			
				Shrubs	Sub-shrubs	Elevation ranges (meters) ³	Major aspect ⁴	Geo graphic zones ⁵	Typical vegetation types ⁶
		Genera	Species						
<i>Cistaceae</i>	Rock-rose family	2							
<i>Cistus</i>	Rock-rose		1	1	0	UND	CIS	UND	INTRO
<i>Helianthemum</i>	Rush-rose		2	0	2	<1300	CIS, CST	CST, I, FH	C, CSS
<i>Cornaceae</i>	Dogwood family	1							
<i>Cornus</i>	Dogwood ²		4	3	0	<2700	CIS, MONT	CST, I	WW, MCF
<i>Crassulaceae</i>	Stonecrop family	4							
<i>Cotyledon</i>			1	0	1	<150	CST	CST	INTRO
<i>Crossosomataceae</i>	Crossosoma family	1							
<i>Crossosoma</i>			2	1	0	<150	CST	I	CSS, C
<i>Cupressaceae</i>	Cypress family	3							
<i>Juniperus</i>	Juniper ²		3	1	0	<1500 (1500-2600)	TRANS, CIS	D-FH	PJ, JTW, C
<i>Ephedraceae</i>	Ephedra family	1							
<i>Ephedra</i>	Ephedra ²		7	1	0	900-2300 (<1100)	CIS, TRANS	CST, D	CBS, C, VG, JTW
<i>Ericaceae</i>	Heath family	11							
<i>Arctostaphylos</i>	Manzanita ²		13	10	0	<2700	CIS, TRANS	G	C, YPF, MC, W
<i>Chimaphila</i>	Pipsissewa		2	2	0	1500-2900	MONT	MTS	MCF
<i>Comarostaphylis</i>	Summer-holly ²		1	1	0	<550	CST	CST	C
<i>Phyllodoce</i>	Mountain-heather		1	1	0	2700-3500	MONT	SB	SF
<i>Rhododendron</i>	Azalea ²		1	1	0	1400-2300	CIS, TRANS	SJ-CM	WW
<i>Vaccinium</i>	Blueberry		1	1	0	700	CIS	MTS, I	WW, C, W
<i>Xylococcus</i>	Mission-manzanita ²		1	1	0	<600	CIS	CST, FH, I	C
<i>Euphorbiaceae</i>	Spurge family	10							
<i>Acalypha</i>	California copperleaf		1	1	0	200-1200	CIS	SR, BV	C, OW
<i>Euphorbia</i>	Spurge		30	1	0	<150	CST, TRANS	I, CST, D	CBS, CSS
<i>Ricinus</i>	Castor-bean ²		1	1	0	<730	CIS	G	INTRO
<i>Tetracoccus</i>			3	1	0	<800	CIS	FH	C
<i>Fabaceae</i>	Pea family	32							
<i>Acacia</i>	Acacia		6	1	0	<1000	CIS	FH	C, INTRO
<i>Amorpha</i>	False Indigo ²		2	2	0	<2300	CIS	SR, SA	CSS, C, YPF, WW
<i>Cercis</i>	Redbud ²		1	1	0	100-1500	TRANS, CIS	LM, CM, FH	C, YPF
<i>Cytisus</i>	Broom ²		2	2	0	<500	CST, CIS	I, CST	INTRO
<i>Lotus</i>	Birdsfoot trefoil ²		22	0	2	<1500	CIS, TRANS	FH, D, I	CSS, CS, C, YPF, JTW
<i>Lupinus</i>	Lupine ²		48	2	4	<2200	CST, CIS	MP, SG, SA, FH, CST	CS, CSS, C, OW, MCF
<i>Pickeringia</i>	Chaparral-pea ²		1	1	0	<1500	CIS	SM, SB, I	C
<i>Psoralea</i>			8	0	1	<1500	CIS	SG	C
<i>Spartium</i>	Spanish-broom ²		1	1	0	<2100	CST	UND	INTRO
<i>Ulex</i>	Gorse		1	1	0	UND	CST	CST	INTRO
<i>Fagaceae</i>	Beech family	3							
<i>Chrysolepis</i>	Chinquapin ²		1		0	1600-3400	MONT	SJ, SG	I MC, SF
<i>Quercus</i>	Oak ²		12	4	0	<1500	CIS, TRANS	G	FHW, C, YPF, W

Southern California Shrub and Subshrub Vegetation Excluding Desert Genera¹

Family/genus	Common name	Total		Chaparral		Shrubs and subshrubs			
				Shrubs	Sub-shrubs	Elevation ranges (meters) ³	Major aspect ⁴	Geo-graphic zones ⁵	Typical vegetation types ⁶
		Genera	Species						
<i>Frankeniaceae</i> <i>Frankenia</i>	Frankenia family Frankenia	1	2	0	1	<100 (<1500)	CST, CIS	CST, AS	CSM, CS, AS
<i>Garryaceae</i> <i>Garrya</i>	Silktassel family Silktassel bush ²	1	4	4	0	<2500	CIS, TRANS, MONT	FH	C, YPF, PJ, FHW
<i>Hippocastanaceae</i> <i>Aesculus</i>	Buckeye family Buckeye	1	1	1	0	<1200	CIS	FH	FHW
<i>Hydrophyllaceae</i> <i>Eriodictyon</i>	Waterleaf family Yerba Santa ²	12	5	4	0	<2500	CIS, TRANS	I, SY-SB- SR	C, YPF, PJ
<i>Turricula</i>	Poodle-dog bush ²		1	1	0	300-2400	CIS, TRANS	MTS, FH	C, YPF
<i>Wigandia</i>			1	0	1	UND	CST	CST	INTRO
<i>Hypericaceae</i> <i>Hypericum</i>	St. John's Wort family St. John's Wort	1	4	1	0	UND	CIS	FH	INTRO
<i>Juglandaceae</i> <i>Juglans</i>	Walnut family Walnut ²	1	1	1	0	<1400	CIS	FH	OW
<i>Lamiaceae</i> <i>Lepechinia</i>	Mint family Pitcher Sage ²	25	4	0	4	<1200	CST, CIS	SA, SG, SM, I	C, FHW
<i>Monardella</i>	Coyote-mint		12	0	6	900-3000 (<300)	CIS, MONT, TRANS	SG, SB, SI, SA, FH	MC, C, YPF, CSS
<i>Salvia</i>	Sage ²		20	6	1	1500 (<3000)	CIS, MONT, TRANS	SB, FH, I	CSS, C, YPF, PJ MC
<i>Satureja</i>	Yerba Buena shrub		2	0	1	<800	CIS	FH	C
<i>Trichostema</i>	Bluecurls ²		5	2	0	<1800	CIS, TRANS	FH	C, YPF, JTW
<i>Lauraceae</i> <i>Umbellularia</i>	Laurel family California Bay ²	1	1	0	0	<1800	CIS	CST	C, FHW, MCF
<i>Loganiaceae</i> <i>Chilanthus</i>	Logania family	2	1	1	0	<700	CST	CST	INTRO
<i>Malvaceae</i> <i>Lavatera</i>	Mallow family Tree-mallow	12	3	0	2	<150	CST	I, CST	CSS, INTRO
<i>Malacothamnus</i>	Globemallow ²		8	4	3	<1500 (<2100)	CST, CIS	FH, SA- CM, I	CSS, C, YPF, FHW
<i>Myoporaceae</i> <i>Myoporum</i>	Myoporum family Myoporum	1	1	1	0	<150	CST	CST	CSS, INTRO
<i>Myricaceae</i> <i>Myrica</i>	Wax-Myrtle family Wax-Myrtle ²	1	1	1	0	<150	CIS	SM	C, CSS
<i>Myrtaceae</i> <i>Eucalyptus</i>	Myrtle family Gum tree	1	2	1	0	UND	CST	CST	INTRO
<i>Nyctaginaceae</i> <i>Mirabilis</i>	Four-O'Clock family Four-O'Clock	8	5	0	1	<800	CIS	CST, FH, I	C, CSS, FHW
<i>Oleaceae</i> <i>Forestiera</i>	Olive family Desert olive	3	1	1	0	<2000	CIS, TRANS	SR-CST	C, CBS, CSS, FHW
<i>Fraxinus</i> <i>Onagraceae</i>	Flowering Ash ² Evening-Primrose family		4	1	0	<1100	CIS	SA-CST	C, FHW
<i>Zauschneria</i>	California-Fuchsia	11	3	0	2	<600	CIS	FH, I	C, CSS

Southern California Shrub and Subshrub Vegetation Excluding Desert Genera¹

Family / genus	Common name	Total		Chaparral		Shrubs and subshrubs			
				Shrubs	Sub-shrubs	Elevation ranges (meters) ³	Major aspect ⁴	Geo graphic zones ⁵	Typical vegetation types ⁶
		Genera	Species						
<i>Papaveraceae</i>	Poppy family	13							
<i>Dendromecon</i>	Tree Poppy ²		1	1	0	<1500	CIS	FH, I	C
<i>Romneya</i>	Matilija Poppy ²		2	0	1	<1200	CIS	FH, CST	C, CSS
<i>Pittosporaceae</i>	Pittosporum family	2							
<i>Pittosporum</i>	Pittosporum		2	1	0	UND	UND	UND	INTRO
<i>Sollya</i>			1	0	1	UND	UND	UND	INTRO
<i>Polemoniaceae</i>	Phlox family	12							
<i>Eriastrum</i>	Mesa-phlox		8	0	1	1200-2400	MONT	MTS	MC
<i>Ipomopsis</i>	Jacumba-gilia		5	0	1	500-1100	CIS, TRANS	FH, D	CBS, PJ, C
<i>Leptodactylon</i>	Prickly-phlox		3	1	1	<1700 (2700)	CIS, MONT	FH, MTS	C, FHW, MCF
<i>Linanthus</i>	Bush-gilia		23	0	1	<2300	CIS, MONT	FH, MT	SC, YPF, OW
<i>Phlox</i>	Phlox		6	0	2	1500-3300	MONT, TRANS	MTS, D	PJ, YPF
<i>Polygalaceae</i>	Milkwort family	1							
<i>Polygala</i>	Milkwort		4	2	0	<900	CIS	I, SM, SA	C, OW
<i>Polygonaceae</i>	Buckwheat family	10							
<i>Eriogonum</i>	Wild Buckwheat ²		67	5	4	300-3400 (150)	MONT CST	CST, MTS, I	CSS, C, CS, YPF, PJ, SGS, JTW, MC
<i>Ranunculaceae</i>	Buttercup family	9							
<i>Clematis</i>	Clematis (Virgin's Bower) ²		3	0	3	<2100	CIS, TRANS	G, FH	C, W, YPF, WW
<i>Rhamnaceae</i>	Buck horn family	6							
<i>Adolphia</i>	California adolphia ²		1	1	0	<1400	CIS	CW	C
<i>Ceanothus</i>	California-Lilac ²		17	17	0	<1800(2000)	CIS, TRANS, MONT	G	C, MC, CSS, PI, YPF, OW, JTW
<i>Rhamnus</i>	Buckthorn ²		5	5	0	<2100	CST, CIS TRANS	I, CST, FH	CS, CSS, OW YPF, CBS, PJ, C WW
<i>Rosaceae</i>	Rose family	30							
<i>Adenostema</i>	Chamise ²		2	2	0	<1800	CIS, TRANS	FH	C
<i>Amelanchier</i>	Service-berry ²		3	2	0	1500-2100 (3400)	MONT, TRANS	MTS	PJ, MC, YPF
<i>Cercocarpus</i>	Mountain-Mahogany ²		5	3	0	<1800 (1200-3000)	CIS, CST	I, G	C, PJ, SGS, MC
<i>Chamaebatia</i>	Fern bush ²		1	1	0	<600	CIS	FH	C
<i>Heteromeles</i>	Toyon ²		1	1	0	<1200 (1600-3300)	CIS	FH, MTS	C
<i>Holodiscus</i>	Spirea ²		3	2	0	<1700	CIS, TRANS	I, FH, MTS	MC, PJ, C
<i>Prunus</i>	Stone-Fruits ²		10	4	0	600-2700 (<1500)	CIS, TRANS	I, MTS	C, YPF, MC, W
<i>Purshia</i>	Bitterbrush ²		1	1	0	800-2700	TRANS, MONT	MTS, D	PJ, JTW
<i>Rosa</i>	Rose ²		3	3	0	<1800	CIS, TRANS	MTS	MC, WW

Southern California Shrub and Subshrub Vegetation Excluding Desert Genera¹

Family/genus	Common name	Total		Chaparral		Shrubs and subshrubs			
				Shrubs	Sub-shrubs	Elevation ranges (meters) ³	Major Aspect ⁴	Geo graphic zones ⁵	Typical vegetation types ⁶
		Genera	Species						
<i>Rubus</i>	Blackberry ²	7	7	0		1200-2400 (<1300)	CIS, TRANS	FH, MTS	MC, YPF, WW, INTRO
<i>Rubiaceae</i>	Madder family	3							
<i>Galium</i>	Bedstraw	26	1	3		<2500	CIS, MONT	I, SG, SR	CSS, C, OW, PJ
<i>Rutaceae</i>	Rue family	3							
<i>Cneoridium</i>	Bushrue ²	1	1	0		<800	CST	I, CST	C, CSS
<i>Salicaceae</i>	Willow family	2							
<i>Salix</i>	Willow ²	13	6	0		<2700	CIS	CW, I	MC, WW
<i>Saxifragaceae</i>	Saxifrage family	10							
<i>Ribes</i>	Currant/Gooseberry ²	18	18	0		<3800	CIS, MONT, TRANS, CST	MTS, I	C, CSS, MC, CF, SF, OW, FHW, WW
<i>Schrophulariaceae</i>	Figwort family	20							
<i>Castilleja</i>	Paint-Brush	19	0	3		<1500	CST, CIS	I, FH	CS, CSS, C
<i>Galvezia</i>	Galvezia	1	1	0		<100	I	I	INTRO
<i>Keckiella</i>	Kecks-pentstemon ²	5	5	0		<2500	CIS, TRANS	MTS, FH	C, YPF, RJ, MC, CBS
<i>Mimulus</i>	Monkey-Flower ²	35	3	3		<1800 (<100)	CIS	FH, I	C, YPF, CSS
<i>Penstemon</i>	Penstemon	27	0	4		1400-3000 (<1500)	CIS, TRANS	MTS, FH	MC, C, FHW, YPF PJ
<i>Simmondsiaceae</i>	Jojoba family	1							
<i>Simmondsia</i>	Jojoba (goatnut) ²	1	1	0		<1500	CIS, TRANS	SB-D	CBS, C, JTW
<i>Solanaceae</i>	Nightshade family	10							
<i>Lycium</i>	Box-Thorn ²	10	6	0		<1800	CST, CIS, TRANS	I, CST, FH	CBS, PJ, SGS, C, CSS, INTRO
<i>Nicotiana</i>	Tobacco ²	5	1			<900	CIS	FH	INTRO
<i>Solanum</i>	Nightshade	15	1	7		<1400 (1500-2700)	CIS	I	CSS, C, CS, YPF, VG, FHW, OW, INTRO
<i>Sterculiaceae</i>	Cacao family	2							
<i>Fremontodendron</i>	Flannel Bush ²	2	2	0		900-2100 (500)	CIS, TRANS	FH	C, OW, YPF, PJ
<i>Styracaceae</i>	Storax family	1							
<i>Styrax</i>	Storax ²	1	1	0		<1500	CIS	FH	C, OW
<i>Verbenaceae</i>	Vervain family	3							
<i>Lippia</i>	Lippia	4	0	1		UND	CIS	I, FH	INTRO
<i>Vitaceae</i>	Grape family	1							
<i>Vitis</i>	Grape ²	1	1	0		<1200	CIS, TRANS	I, CW	OW, CSS

¹Based on Munz (1974) and McMinn (1939).

²Species from this genus are in the guide.

³*Elevation ranges* based on ranges of elevation given by Munz (1974) and McMinn (1939) for the various species in the genus. The indicated values should generally be the range of elevations in meters which includes the extent of the shrub and subshrub species. Where there are definable breaks between species or groups of species, the elevation range of the second grouping is shown in parentheses. In some cases there is no information identifying elevation ranges, shown as UND (undetermined).

⁴*Major aspect* codes broadly identify the major areas that include habitats of the majority of shrub or subshrub species in a genus. Usually, more than one code is entered for a genus. Multiple codes mean that the species are found on one or more aspects. The codes are:

CIS - On the ocean side of the mountains as opposed to the desert side

CST - Mostly in the coastal influence zone

D - Primarily desert species

I - Primarily island species

MONT - Mostly high mountain species

TRANS - On the desert side of the mountains as opposed to the ocean side

UND - Aspect not determined

⁵*Geographic zone* codes identify the geographic areas indicated for the shrub and subshrub species by Munz (1974) and McMinn (1939). The geographic code does not imply exclusive representation in the zones; it does imply that species in the genus should be found in the zone(s) indicated. The codes are:

AS - Alkali sink

BV - Borrego Valley (mostly San Diego and Imperial counties)

CW - Canyons and washes

CM - Cuyamaca Mountains (San Diego County)

CSM - Coastal salt marshes

CST - Coastal units

D - Deserts

FH - Foothills

C - Generally widespread, many geographical zones

HD - High desert (mostly San Bernardino and Los Angeles counties)

I - Islands

LD - Low desert (mostly San Bernardino, Riverside, and Imperial counties)

LM - Laguna Mountains (San Diego County)

MP - Mount Pinos (mostly Ventura County)

MIS - Mountains in general

PM - Palomar Mountains (mostly San Diego County)

SA - Santa Ana mountains (Orange and Riverside counties)

SG - San Gabriel Mountains (Los Angeles County)

SJ - San Jacinto Mountains (Riverside County)

SM - Santa Monica Mountains (Los Angeles and Ventura counties)

SN - Sierra Nevada

SR - Santa Rosa Mountains (San Diego and Imperial counties)

SSM - Santa Susanna Mountains (Ventura and Los Angeles counties)

SY - Santa Ynez Mountains (Santa Barbara to Ventura counties)

UND - Undefined

⁶*Typical vegetation* types codes are the vegetation types identified by Munz (1974) and McMinn (1939) as frequent habitats for shrub and subshrub species in the genus. The identified communities are not necessarily the only habitats of the species. The following codes are:

AS - Alkali sink

BCPF - Bristle-cone pine forest

C - Chaparral

CBS - Creosotebush scrub

CF - Conifer forest

CGS - Coastal sagebrush shrub

CS - Coastal strand

CSM - Coastal salt marsh

CSS - Coastal sage scrub

CW - Conifer woodland

FH W - Foothill woodland

INTRO - Introduced species with no community identified

JTW - Joshua tree woodland

MC - Montane conifers

MCF - Montane conifer forest

MCW - Montane conifer woodland

OW - Oak woodland (southern)

PJ - Pinyon-juniper

SF - Subalpine forest

SGS - Sagebrush scrub

VG - Valley grassland

W - Woodland

WW - Waterway areas (riparian)

YPF - Yellow pine forest

APPENDIX B

Index to species

Latin name	Common name	Page	Figure
<i>Adenostoma fasciculatum</i>	Chamise (Greasewood)	15	5
<i>A. fasciculatum</i> var. <i>obtusifolium</i> ²	--	15	
<i>A. sparsifolium</i>	Red shank (Ribbon bush)	15	6
<i>Adolphia californica</i>	Adolphia	16	7
<i>Amelanchier utahensis</i>	Service berry	16	8
<i>Amorpha californica</i>	False-indigo	17	9
<i>A. fruticosa</i> var. <i>occidentalis</i> ²	Desert false-indigo	17	--
<i>Arctostaphylos</i> spp.	Manzanita	17	--
<i>A. glandulosa</i> ¹	Eastwood manzanita	18	10
<i>A. glauca</i> ¹	Bigberry manzanita	18	11
<i>A. otayensis</i> ¹	Otay manzanita	19	12
<i>A. parryana</i> ¹	Parry manzanita	19	13
<i>A. patula</i> var. <i>platyphylla</i> ²	--	19	--
<i>A. pringlei</i> ssp. <i>drupacea</i> ¹	Pink-bracted manzanita	19	14
<i>A. pungens</i> ¹	Mexican manzanita	20	15
<i>A. tomentosa</i> ²	Woollyleaf manzanita	17	--
<i>Artemisia californica</i>	Coast sagebrush	20	16
<i>A. tridentata</i>	Basin sagebrush	20	17
<i>Atriplex canescens</i>	Wingscale salt bush (Shadscale)	21	18
<i>A. lentiformis</i>	Lenscale saltbush	22	19
<i>A. lentiformis</i> ssp. <i>breweri</i> ²	--	22	--
<i>Baccharis</i> spp.	Baccharis	22	--
<i>B. glutinosa</i>	Mulefat	22	20
<i>B. pilularis</i> ssp. <i>consanguinea</i> ¹	Chaparral broom	22	21
<i>B. plummerae</i> ²	Plummer baccharis	23	--
<i>B. sarothroides</i>	Broom baccharis	23	22
<i>Berberis</i> (<i>Mahonia</i>) ³ spp	--	24	--
<i>B. dictyota</i> ¹	Barberry	24	23
<i>B. pinnata</i> ²	Shiny-leaf barberry	24	--
<i>B. nevini</i> ²	--	24	--
<i>Brickellia californica</i>	Brickellbush	24	24
<i>Ceanothus</i> spp.	Californica-lilacs	24	--
<i>C. cordulatus</i> ¹	Mountain whitethorn	25	25
<i>C. crassifolius</i> ¹	Hoaryleaf ceanothus	26	26
<i>C. crassifolius</i> var. <i>planus</i> ²	--	26	--
<i>C. cuneatus</i> ¹	Buckbrush	26	27
<i>C. greggii</i> var. <i>perplexans</i> ¹	Cup-leaf ceanothus	27	28
<i>C. greggii</i> var. <i>vestitus</i> ²	--	27	--
<i>C. integerrimus</i> ¹	Deerbrush	27	29
<i>C. integerrimus</i> var. <i>puberulus</i> ²	--	27	--
<i>C. leucodermis</i> ¹	Chaparral whitethorn	28	30
<i>C. megacarpus</i> ¹	Bigpod ceanothus	28	31
<i>C. oliganthus</i> ¹	Hairy ceanothus	28	32
<i>C. spinosus</i> ¹	Greenback ceanothus	29	33
<i>C. tomentosus</i> var. <i>olivaceus</i> ¹	Woollyleaf ceanothus	29	34
<i>C. verrucosus</i> ¹	Wartsystem ceanothus	29	35
<i>Cercis occidentalis</i>	Western redbud	30	36
<i>Cercocarpus betuloides</i>	Western mountain-mahogany	31	37
<i>C. ledifolius</i>	Curlleaf mountain-mahogany	31	38

Latin name	Common name	Page	Figure
<i>Chamaebatia australis</i>	San Diego mountain-misery	31	39
<i>C. foliolosa</i> ²	Sierra mountain misery	32	--
<i>Chysolepis sempervirens</i>	Bush chinquapin	32	40
<i>Chrysothamnus nauseosus</i> ssp. <i>bernardinus</i>	Rubber rabbitbrush	32	41
<i>Clematis</i> spp.	Clematis	33	--
<i>C. lasiantha</i> ²	Pipestem clematis	33	--
<i>C. ligusticifolia</i>	Western clematis	33	42
<i>Cneoridium dumosum</i>	Bushrue	33	43
<i>Comarostaphylis diversifolia</i>	Summer-holly	34	44
<i>Cornus</i> spp	--	34	--
<i>C. occidentalis</i> ²	Dogwood	34	--
<i>C. stolonifera</i> ¹	American dogwood	34	45
<i>Cytisus monspessulanus</i>	French broom	34	46
<i>Dendromecon rigida</i>	Bush poppy (Tree poppy)	35	47
<i>Encelia californica</i>	California encelia	35	48
<i>E. farinosa</i>	Brittlebush (Incienso)	35	49
<i>Ephedra</i> spp.	Ephedra	36	--
<i>E. californica</i> ¹	Mormon-tea	36	50
<i>E. viridis</i> ¹	Green ephedra	37	51
<i>Eriodictyon crassifolium</i>	Thickleaf yerba santa	37	52
<i>E. crassifolium</i> var. <i>denudatum</i> ²		38	--
<i>E. traskiae</i> ²	Trask yerba santa	38	--
<i>E. trichocalyx</i>	Yerba santa	38	53
<i>Eriogonum fasciculatum</i>	California buckwheat	38	54
<i>E. parvifolium</i>	Seacliff buckwheat	39	55
<i>Euonymus occidentalis</i> spp. <i>parishii</i>	Burning bush	39	56
<i>Eurotia lanata</i> (<i>ceratoides</i> l. ³)	Winter fat	39	57
<i>Fraxinus dipetala</i>	Flowering ash (Foothill ash)	40	58
<i>Fremontodendron californicum</i>	Flannel bush	40	59
<i>Garrya veatchii</i>	Silktassel	40	60
<i>Haplopappus parishii</i>	Goldenbush	41	61
<i>H. pinifolius</i>	Pine goldenbush	42	62
<i>H. squarrosus</i>	Sawtooth goldenbush	42	63
<i>H. squarrosus</i> ssp. <i>grindelioides</i> ²		42	--
<i>Heteromeles arbutifolia</i>	Toyon (Christmas berry)	42	64
<i>Holodiscus discolor</i>	Creambush	43	65
<i>Isomeris arborea</i> (<i>Cleome isomeris</i>) ³	Bladderpod	43	66
<i>Juglans californica</i>	California black walnut	44	67
<i>Juniperus</i> spp.	Juniper	44	--
<i>J. californica</i> ¹	California juniper	44	68
<i>J. osteosperma</i> ¹	Utah juniper	44	69
<i>Keckiella antirrhinoides</i>	Bush penstemon	45	70
<i>K. cordifolius</i>	Straggly penstemon	46	71
<i>K. ternata</i>	Whorl-leaf penstemon	46	72
<i>Lepechinia calycina</i>	Pitcher sage	46	73
<i>L. fragrans</i> ²	--	46	--
<i>Lepidospartum squamatum</i>	Scalebroom	47	74

Latin name	Common name	Page	Figure
<i>Lonicera</i> spp.	Honeysuckle	47	--
<i>L. hispidula</i> ²	California honeysuckle	47	--
<i>L. interrupta</i> ¹	Chaparral honeysuckle	47	75
<i>L. involucrata</i> ²	Twinberry	48	--
<i>L. subspicata</i> ¹	Santa Barbara honeysuckle	48	76
<i>L. subspicata</i> var. <i>johnstonii</i> ²	--	48	--
<i>Lotus scoparius</i>	Deerweed	48	77
<i>Lupinus</i> spp.	Lupine	49	--
<i>L. albifrons</i> ¹	Silver lupine	49	78
<i>L. arboreus</i> ²	Tree lupine	49	--
<i>L. chamissonis</i> ²	Dune lupine	49	--
<i>L. excubitus</i> var. <i>Johnstonii</i> ²	--	49	--
<i>L. longifolius</i> ²	Bush lupine	49	--
<i>Lycium californicum</i>	Box thorn	49	79
<i>Malacothamnus fasciculatus</i>	Bush mallow	50	80
<i>M. fasciculatus</i> var. <i>laxiflorus</i> ²	--	50	--
<i>Mimulus longiflorus</i> (<i>Diplacus l.</i> ³)	Monkeyflower	50	81
<i>Myrica californica</i>	Pacific wax-myrtle	50	82
<i>Nicotiana glauca</i>	Tree tobacco	51	83
<i>Pickeringia montana</i>	Chaparral-pea	51	84
<i>Prunus</i> spp.	Plum	51	--
<i>P. emarginata</i> ¹	Bitter cherry	52	85
<i>P. fasciculata</i>	Desert almond	52	86
<i>P. ilicifolia</i>	Hollyleaf cherry	53	87
<i>P. virginiana</i> ssp. <i>demissa</i> ¹	Western choke cherry	53	88
<i>Purshia glandulosa</i>	Bitterbrush	54	89
<i>Quercus</i> spp.	Oak	54	--
<i>Q. dumosa</i> ¹	California scrub oak	54	90
<i>Q. dunni</i> ²	Palmer oak	55	--
<i>Q. wislizenii</i> var. <i>frutescens</i> ¹	Interior live oak	55	91
<i>Rhamnus californica</i>	Coffeeferry	55	92
<i>R. crocea</i>	Redberry	56	93
<i>R. ilicifolia</i>	Hollyleaf redberry	56	94
<i>Rhododendron occidentale</i>	Western azalea	56	95
<i>Rhus integrifolia</i>	Lemonadeberry	57	96
<i>R. laurina</i> (<i>Malosma l.</i> ³)	Laurel sumac	57	97
<i>R. ovata</i>	Sugar bush	58	98
<i>R. trilobata</i>	Squaw bush (Basket sumac)	58	99
<i>Ribes</i> spp.	Currants (Gooseberry)	59	--
<i>R. amarum</i> ¹	Bitter gooseberry	59	100
<i>R. aureum</i> var. <i>gracillimum</i> ¹	Golden currant	60	101
<i>R. cereum</i> ²	Squaw currant	60	--
<i>R. indecorum</i> ²	White-flowered currant	60	--
<i>R. malvaceum</i> ¹	Chaparral currant	60	102
<i>R. montigenum</i> ¹	Mountain gooseberry	60	103
<i>R. nevadense</i> ¹	Sierra currant	61	104
<i>R. roezlii</i> ¹	Chaparral gooseberry	61	105

Latin name	Common name	Page	Figure
<i>R. speciosum</i> ¹	Fuchsia-flowered gooseberry	62	106
<i>Ricinus communis</i>	Castor-bean	62	107
<i>Romneya coulteri</i>	Matilija poppy	63	108
<i>Rosa</i> spp.	Wild rose	63	--
<i>R. californica</i> ¹	California wild rose	63	109
<i>R. gymnocarpa</i> ¹	Wood rose	64	110
<i>R. woodsii</i> ²	--	63	--
<i>Rubus</i> spp.	Blackberry (Raspberry)	64	--
<i>R. glaucifolius</i> var. <i>ganderi</i> ²	--	64	--
<i>R. leucodermis</i> var. <i>bernardinus</i> ¹	Western raspberry	64	111
<i>R. parviflorus</i>	Thimbleberry	65	112
<i>R. ursinus</i> ¹	California blackberry	65	113
<i>Salix</i> spp.	Willow	65	--
<i>S. exigua</i> ²	Narrowleaf willow	66	--
<i>S. hindsiana</i>	Sandbar willow	66	114
<i>S. lasiolepis</i> ¹	Arroyo willow	66	115
<i>Salvia</i> spp.	Sage	67	--
<i>S. apiana</i> ¹	White sage	67	116
<i>S. clevelandii</i> ¹	Cleveland sage	67	117
<i>S. leucophylla</i> ¹	Purple sage	68	118
<i>S. mellifera</i> ¹	Black sage	68	119
<i>Sambucus</i> spp.	Elderberry	68	--
<i>S. caerulea</i> ²	Blue elderberry	69	--
<i>S. mexicana</i> ¹	Mexican elderberry	68	120
<i>Senecio douglasii</i>	Bush groundsel	69	121
<i>S. spartioides</i> ²	Groundsel	70	--
<i>Simmondsia chinensis</i>	Jobba (Goatnut)	70	122
<i>Spartium junceum</i>	Spanish broom	70	123
<i>Styrax officinalis</i> var. <i>fulvescens</i>	Storax	71	124
<i>Symphoricarpos</i> spp.	--	71	--
<i>S. mollis</i> ¹	Snowberry	71	125
<i>S. parishii</i> ²	Mountain snowberry	71	--
<i>Tetradymia comosa</i>	Hairy horsebrush	71	126
<i>Toxicodendron diversilobum</i>	Poison-oak	72	127
<i>Trichostema lanatum</i>	Woolly blue curls	72	128
<i>Turricula parryi</i>	Poodle-dog bush	72	129
<i>Umbellularia californica</i>	California bay (laurel)	73	130
<i>Venegasia carpesioides</i>	Canyon sunflower	74	131
<i>Viguiera laciniata</i>	San Diego sunflower	74	132
<i>Vitis girdiana</i>	Desert wild grape	74	133
<i>Xylococcus bicolor</i>	Mission-manzanita	75	134
<i>Yucca</i> spp.	Yucca	75	--
<i>Y. schidigera</i> ¹	Spanish dagger	75	135
<i>Y. whipplei</i> ¹	Chaparral yucca (Our Lord's candle)	76	136

¹Species described but only the genus name appears in the plant key.

²Species mentioned but not described; species name is not in the dichotomous key.

³Genus and / or species has been renamed.

Conrad, C. Eugene. **Common shrubs of chaparral and associated ecosystems of southern California.** Gen. Tech. Rep. PSW-99. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture; 1987. 86 p.

This Guide presents taxonomic keys based on vegetative features of 132 southern California shrub and subshrub species found in an area bounded by the southern part of the coast ranges, the north and east sides of the transverse and peninsular ranges, and Mexico. The keys are supported with instructions and an extensive glossary. Species discussion includes a brief description and generalized distribution of each species. When known, the fire response mechanism, wildlife value, and cultural value are given. A line drawing or photograph of each species is included. All genera that include chaparral shrub and subshrub species recognized by *A Flora of Southern California* by Philip A. Munz are listed in an appendix. Typical plant communities that include species in the genera listed along with elevation range, aspects, and geographic zones of the species habitats are given.

Retrieval Terms: chaparral, fire, shrubs, southern California, taxonomy, wildlife