

Master Naturalist Plant ID



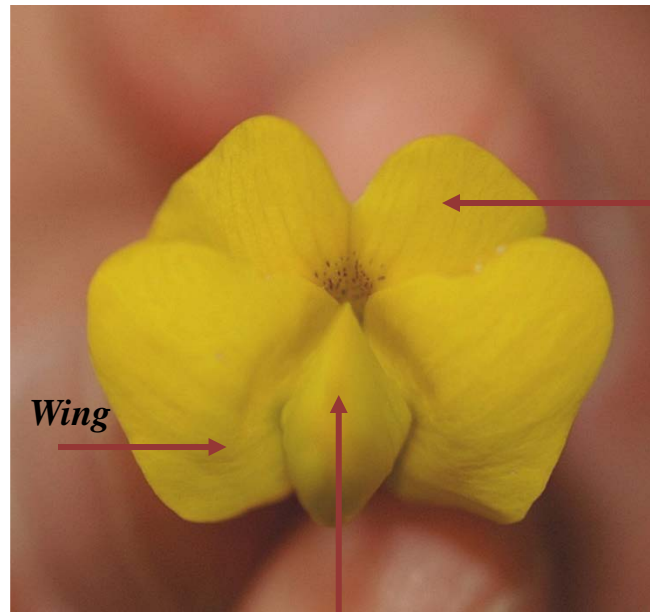
Leaves alternate, ternately compound, palmate, stipulate; leaflets with entire margins.

Inflorescence a raceme; flowers zygomorphic, papilionaceous; petals 5, yellow; stamens 10, distinct.

Fabaceae Family Characteristics

Herbs shrubs or trees; flowers zygomorphic; leaves compound; fruit a legume or loment.

Fruit a legume, sessile, pods widely spreading, curved, glabrous or nearly so.



Wing

Keel

Banner or Standard

Calyx



Golden banner (*Thermopsis divaricarpa*)
Herbaceous, perennial with showy flowers; blooms April-June.

**Colorado
State**
University



**B.S. Rangeland Ecology
concentration Restoration Ecology**

City of
Fort Collins

Natural
Areas

**Master Naturalist
1998- Current**



State President 2010-2013



**CSU Extension – NPM Instructor
2008- Current**



**Forensic Botanist
2013 (11) - Current**





prairie Junegrass
(*Koeleria macrantha*)

"I believe a leaf of
grass is no less than
the journey-work of
the stars."

- Walt Whitman

Master Naturalist Plant ID

Vegetation in the Natural Areas

Common vs. Latin Names

Terminology

Dichotomous Keys

Plant Jeopardy







Thelesperma filifolium
– stiff greenthread
Soapstone Prairie 2015

Vegetation in Natural Areas

Rare Plants

State Records

Lysimachia thyrsiflora

(1903 in State)

Eleocharis atropurpurea

Only 1 other Record

Azolla mexicana

Liatris ligulistylis

Aristida basiramea

Calystegia sepium

Cyperus squarrosus

Lobelia siphilitica

var. *ludoviciana*



CFC Species of Interest (SOI)	156
(SOI) in Natural Areas	57
Threatened and Endangered	2
Species tracked by CNHP	101 (27)
State records (current)*	2
County records (current)*	23
Endemic – <i>Physaria bellii</i>	1
Only found in Larimer County – <i>Besseya wyomingensis</i>	1
Only 1 other record for County	7
Only 1 other record for State	1

County Records

Acorus calamus (1972)

Agalinis tenuifolia

Anagallis minima (Weld)

Ammannia robusta

Spiranthes diluvialis

Gaura neomexicana ssp.

coloradensis

Carex atherodes

Carex crawei

Cyperus bipartitus

Cyperus lupulinus

Dichanthelium acuminatum

(1890) in Larimer

Lemna minuta

Lipocarpha aristulata

(1893) in Larimer

Marsilea vestita

Oligoneuron album

(1898) Larimer

Pediomelum esculentum

Penstemon eriantherus

Ribes americanum

Ruppia cirrhosa

Sporobolus heterolepis

Stephanomeria runcinata

Triodanis leptocarpa

Wolffia columbiana

*Herbaria records that are 30 years or older are considered historic populations.

Vegetation in Natural Areas

Top 10 Best Condition

Rate	Natural Area	Score
1	Soapstone Prairie	45.98
2	Pineridge	43.59
3	Gateway	42.98
4	Bobcat Ridge	42.13
5	Reservoir Ridge	41.56
6	Cathy Fromme Prairie	41.27
7	Coyote Ridge	40.51
8	Maxwell	40.20
9	Redtail Grove	39.26
10	McMurry Ponds	38.85

Vegetation in Natural Areas

Top 10 Worst Condition

Rate	Natural Area	Score
1	Williams	23.19
2	Fischer	24.88
3	Coterie	25.14
4	Eagle View	27.28
5	Cottonwood Hollow	29.11
6	Fossil Creek Reservoir	29.85
7	Pelican Marsh	30.78
8	Prospect Ponds	30.80
9	Springer	30.91
10	Arapaho Bend	31.83

Vegetation in Natural Areas

Top 10 for Diversity

Rate	Natural Area	# of Species
1	Soapstone Prairie	451
2	Gateway	255
3	Reservoir Ridge	241
4	Coyote Ridge	226
5	Bobcat Ridge	223
6	Cathy Fromme Prairie	220
7	Pineridge	215
8	Kingfisher Point	164
9	Arapaho Bend	142
10	McMurry Ponds	138

The "Big Families"

Approx. 3,322 species

143 families (18 Big, ~75%)

Families end in "aceae"



ASTERACEAE



FABACEAE



BRASSICACEAE

Family	In Colorado	East Slope to 6,800 ft.	In Natural Areas	%
Asteraceae - Aster	562	434	139	41%
Poaceae - Grass	351	301	135	53%
Fabaceae - Pea	265	158	54	42%
Brassicaceae - Mustard	183	137	37	39%
Cyperaceae - Sedge	163	146	52	69%
Plantaginaceae - Plantain	104	68	32	60%
Polygonaceae - Buckwheat	101	62	21	46%
Rosaceae - Rose	101	86	48	74%
Boraginaceae - Borage	78	38	11	35%
Caryophyllaceae - Pink	72	60	15	43%
Chenopodiaceae - Goosefoot	71	54	23	44%
Ranunculaceae - Buttercup	70	60	19	54%
Onagraceae – Evening primrose	69	48	17	45%
Polemoniaceae - Phlox	68	39	3	10%
Apiaceae - Carrot	65	45	11	37%
Salicaceae - Willow	47	39	12	48%
Juncaceae - Rush	41	36	16	73%
Lamiaceae – Mint	41	36	19	61%
Euphorbiaceae - Spurge	31	26	13	50%

"I call ALL plants Opuntia polyacantha."

- Kimberly Frasier, Master Naturalist, 2007





But Crystal...Common
Names are easier to
remember...

Stinking orache
Garden orache
Jack go to bed at noon
Welcome home husband
Kiss me over the garden gate
No matter how drunk ye be
Ramping fumitory
Butter and eggs
Lambquarters
Shaggy dwarf morning glory
Chamisso sedge
Smallflower halfchaff sedge



At least 84
known common
names in English



Viola nuttallii
Nuttall's viola

You Already Know...

Asparagus

Chrysanthemum

Aster

Coleus

Cosmos

Delphinium

Geranium

Zinnia

Rhododendron

Magnolia

Fuchsia

Petunia

Begonia



Origin of Latin Names

COMMEMORATIVE



Thomas Nuttall



Viola nuttallii

HABIT



Thermopsis montana
of mountains

Photo by Paul
Sheri Hagwood.
USDI Bureau of
Land
Management

GROWTH FORM



Mahonia repens
creeping

MORPHOLOGICAL FEATURE



Thermopsis divaricarpa
spreading fruit

SCIENTIFIC NAMES

Genus + specific epithet = Species Name

Thermopsis *divaricarpa* A. Nelson

Thermos= lupine

opsis= appearance

Spreading fruit



Working in Russia



Illustrated identification guide of the Perm Region plants // S.A. Ovesnov, E.G. Efimik, T.V. Kozminykh et al.; ed. by S.A. Ovesnov. Perm: Book world, 2007. 743 p.

Erodium cicutarium

Род 2. *Erodium* L'Her. – Аистник, или Журавельник

Растение опушено простыми и железистыми волосками. Листья перисто-расчепчатые, с перисто-раздельными сегментами $\text{O}/511$. Лепестки розовые, 4–6 мм длины. Тычинок 10: 5 с пыльниками и 5 стаминодиев. Створки коробочки с носиком, спирально скрученным в нижней части

E. cicutarium (L.) L'Her. – А. цикутиный (табл. 20, рис. 2) (⊙, ⊚. 10–40. V–IX. Европейско–среднесибирско–древнесредиземноморский.) В посевах, огородах, у жилья и дорог, на залежах, сорных местах. Изредка (1, 5); часто (2–4). Терофит или гемикриптофит, монокарпик длительной вегетации. Мезофит. Лекарственное, кормовое, медоносное. $2n = 40$.



" Every project, every analysis, and every compilation of diversity begins with one thing - the identification of the species around us."

Jennifer Ackerfield, Flora of Colorado



Dichotomous Key

Couplet

1a. Plant reproduces by spores, never having true flowers or seeds.....**Fern and Fern Allies**

1b. Plants having true seeds, with flowers or cones; gymnosperms and angiosperms.....**(2)**

MAJOR GROUPS

**Fern & Fern
Allies**



Gymnosperms



Angiosperms



SPORE



**Ferns & Fern
Allies**

SEED



**Gymnosperms
(cones)**



**Angiosperms
(ovary & flowers)**

DURATION

ANNUAL

- Lives for one year or less.
- Puts energy into seed production.



CHEATGRASS (*Bromus tectorum*)

PERENNIAL

- Lives longer than three years.
- Puts energy into root system and seed production.



LEAFY SPURGE (*Euphorbia esula*)

BIENNIAL

- Typically lives for two years.
- Puts energy into seed production.



TEN PETAL MENTZELIA (*Mentzelia decapetala*)

MONOCOTYLEDON

DICOTYLEDON

“COTYLEDON” meaning “LEAF”

**Parallel
veination**

3-merous



Mariposa lily (*Calochortus gunnisonii*)

**Netlike
veination**

4- or 5-merous



Showy milkweed (*Asclepias speciosa*)

GROWTH FORMS



Ponderosa pine (*Pinus ponderosa*)



Wood's rose (*Rosa woodsii*)

WOODY
GRASSES
TREES
SHRUBS
VINES
CACTUS

HERBACEOUS
GRASSES
HERBS
VINES
FORBS



Sidebells penstemon
(*Penstemon secundiflorus*)



Gaillardia (*Gaillardia aristata*)

Stems

LENTICLES

NODE

Resin Dots
Thorns
Hairs
Pith



**TERMINAL
BUD**

**LATERAL
BUD**

INTERNODE

Chokecherry (*Prunus virginiana* var. *melanocarpa*)

Buds

Leaf Scar

Bundle Scar

Bud Scale
(margin)

Stipule



Flower and
Vegetative
Buds

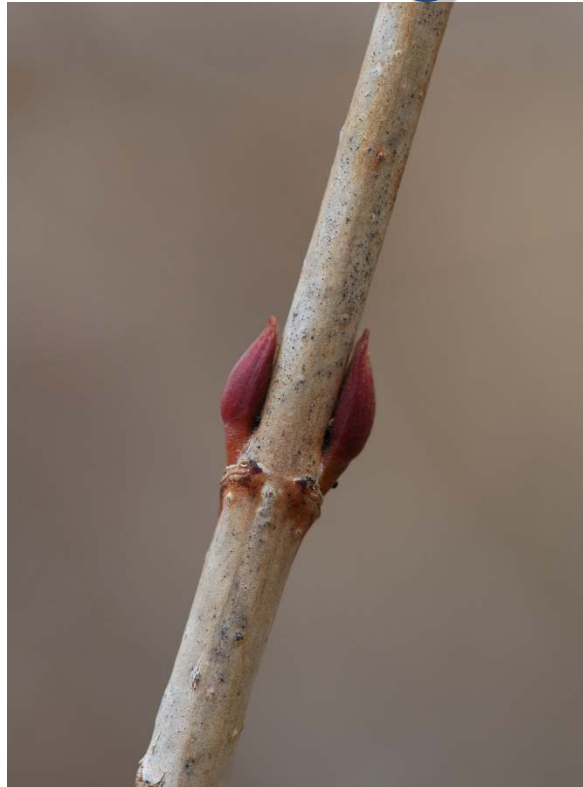
Plains cottonwood (*Populus
deltoides* ssp. *monilifera*)

Bud Arrangement



Coyote Willow (*Salix exigua*)

**ALTERNATE
1 LEAF PER
NODE**



Cranberry bush (*Viburnum sp.*)

**OPPOSITE
2 LEAVES PER
NODE**



Common buckthorn (*Rhamnus cathartica*)

**SUB-
OPPOSITE**

LEAF COMPOSITION

SIMPLE

Single
segment



American plum (*Prunus americana*)

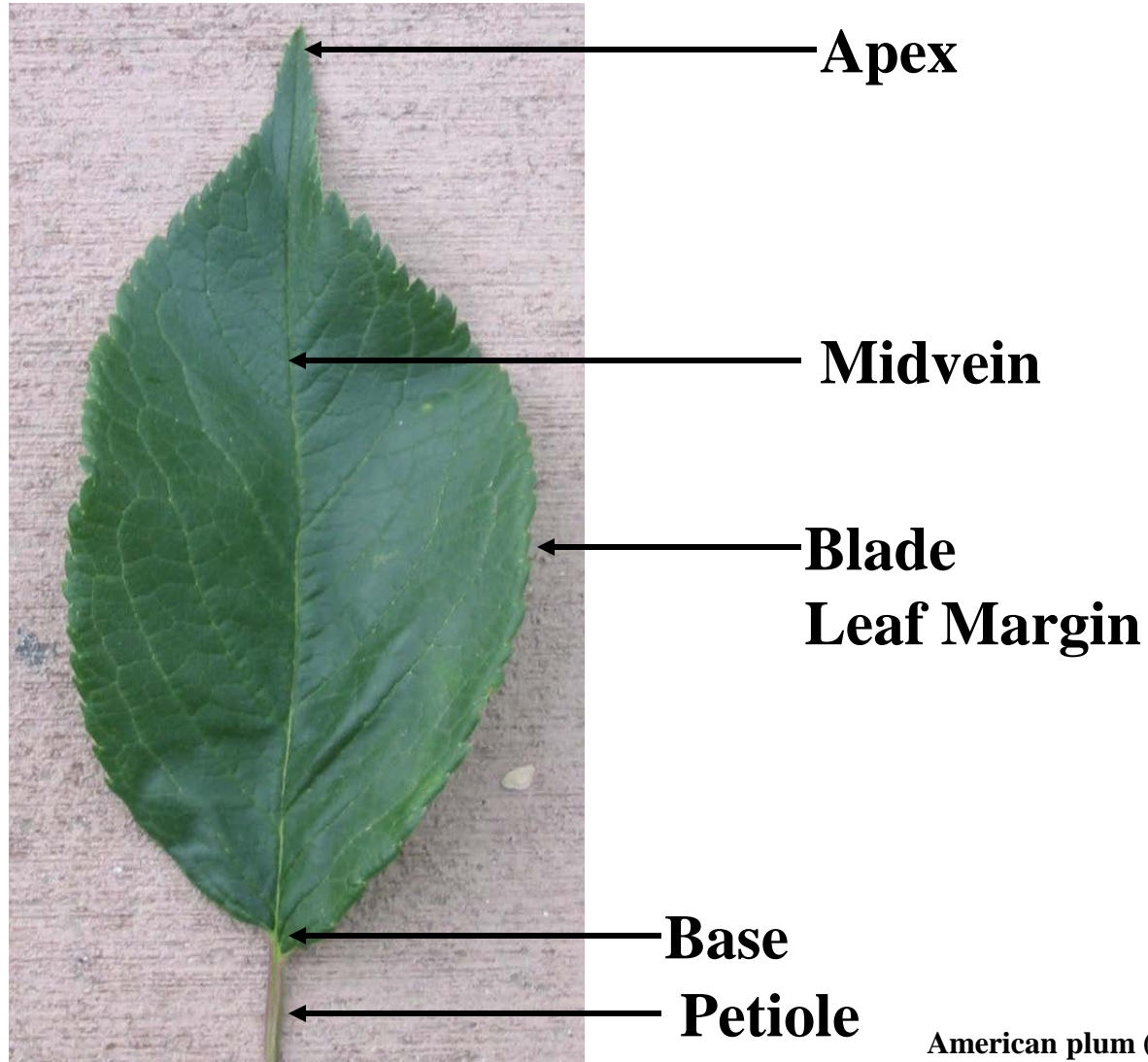


Mountain ash (*Sorbus scolopulina*)

COMPOUND

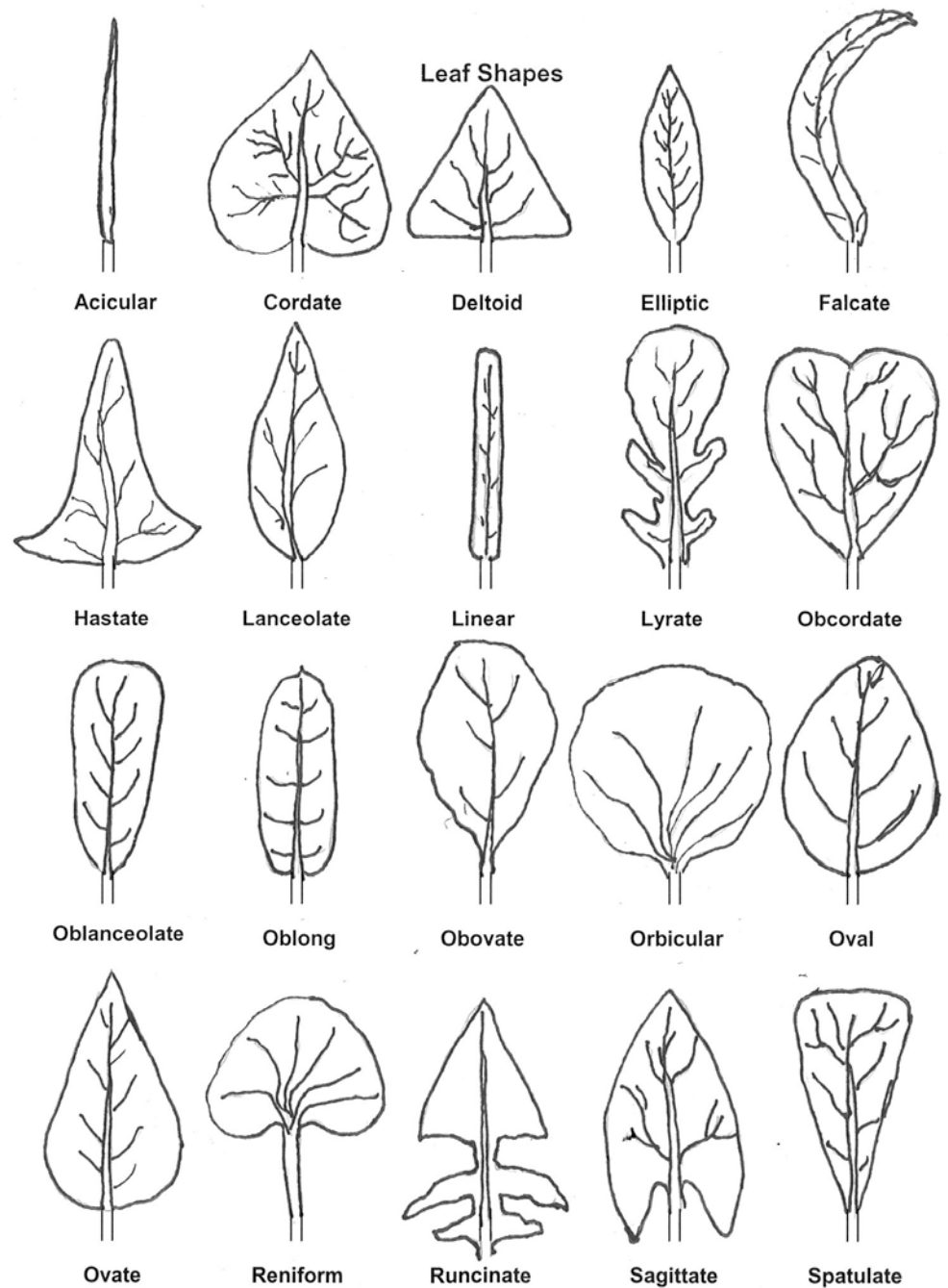
Two or more
segments

PARTS OF A SIMPLE LEAF



American plum (*Prunus americana*)

LEAF SHAPES



Illustrations by Crystal Strouse

LEAF APICES



Broadly



Narrowly



Abruptly



Broadly



Narrowly



Apiculate



Aristate



Caudate

Acuminate



Cuspidate

Acute



Emarginate



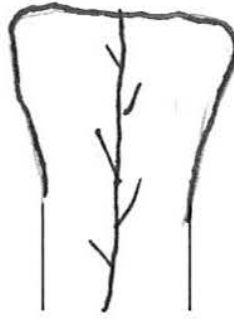
Mucronate



Obtuse



Rounded



Truncate

LEAF BASES



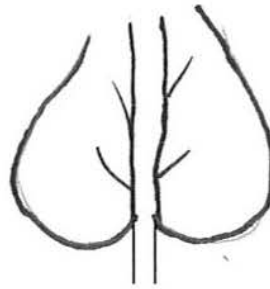
Acute



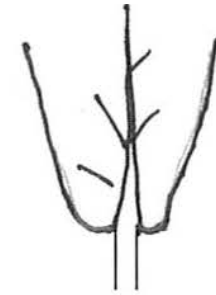
Auriculate



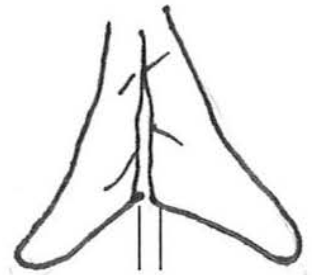
Clasping



Cordate



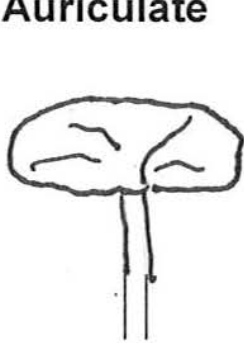
Cuneate



Hastate



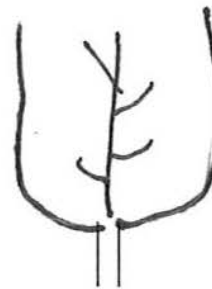
Oblique



Peltate



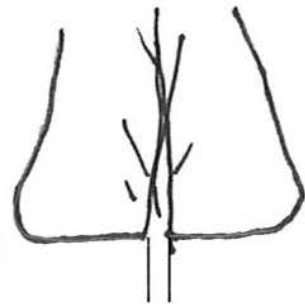
Perfoliate



Rounded



Sagittate

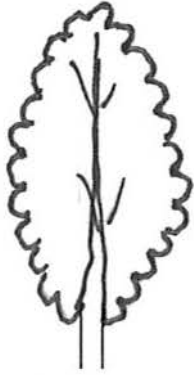


Truncate

LEAF MARGINS



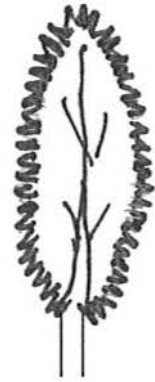
Ciliate



Crenate



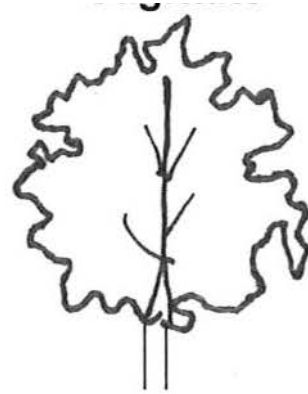
Dentate



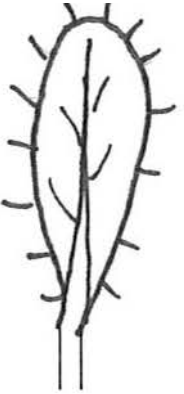
Denticulate



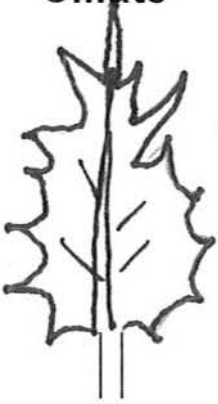
Entire



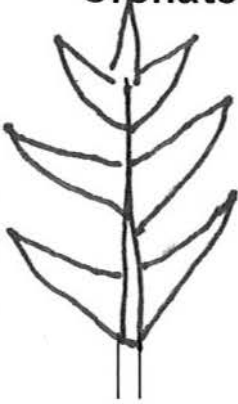
Erose



Fimbriate



Incised



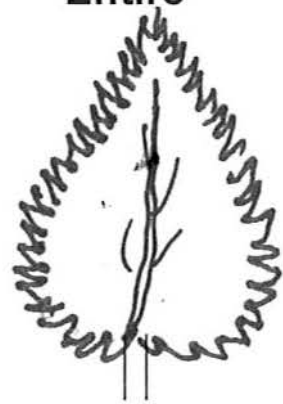
Laciniate



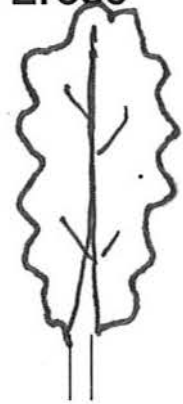
Serrate



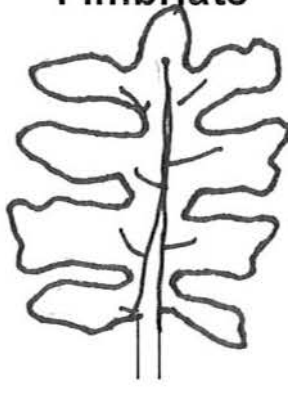
Double Serrate



Serrulate



Sinuate



Undulate

PARTS OF A COMPOUND LEAF



— Leaflet

— Rachis

— Petiole

— Stipule

Wood's rose (*Rosa woodsii*)

COMPOUND LEAF COMPOSITION

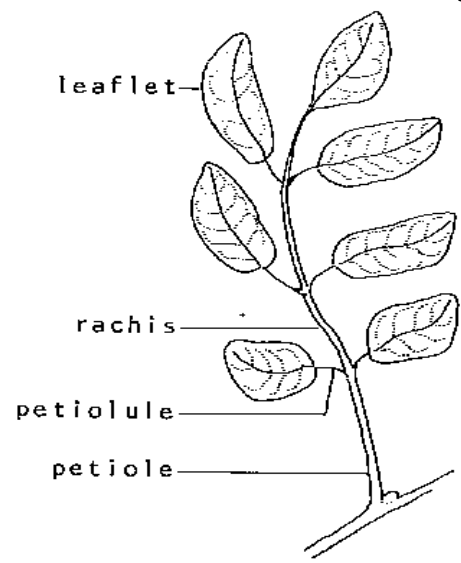


Palmately Compound

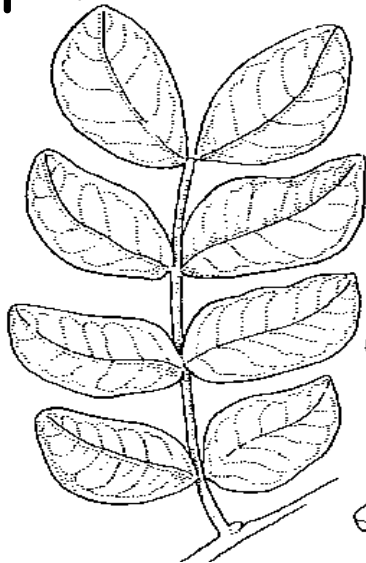
Ternate

Biternate

Pinnately Trifoliate



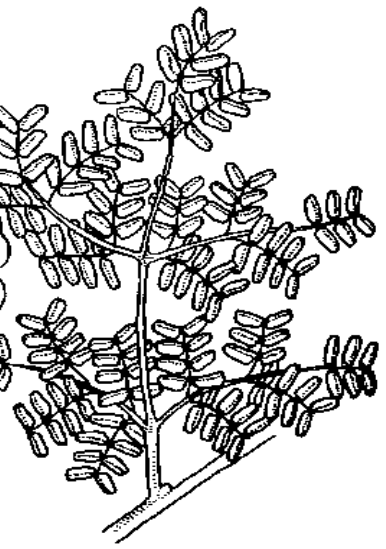
Odd Pinnate



Even Pinnate



Bipinnate



Tripinnate

LEAF VENENATION



Yucca (Yucca glauca)

PARALLEL



Mountain ash (Sorbus scolopulina)



American plum (Prunus americana)

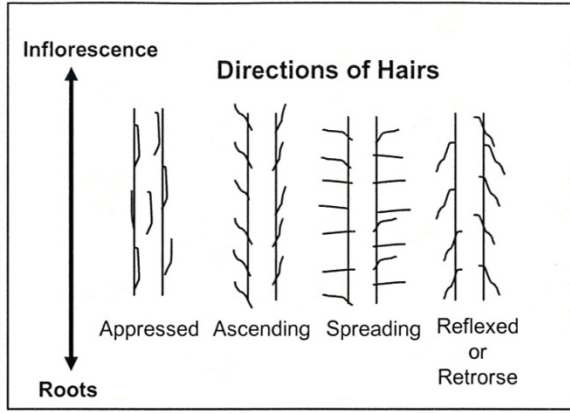
PINNATE



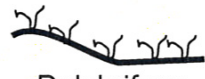
Golden currant (Ribes aureum)

PALMATE

Splitting Hairs



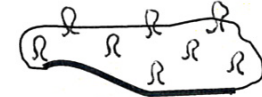
Barbellate



Dolabriform
(attached in middle of hair)



Echinate



Farinose or Mealy



Floccose



Glandular



Hirsute



Hirtellous



Hispid



Hooked



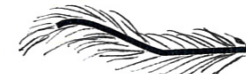
Lanate



Peltate



Pilose



Plumose



Puberlent

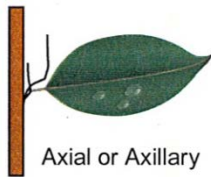
General Terminology of Hairs



Glabrous (no hair) Glaucous (waxy coating) Pubescent (with hair) Glabrate (nearly hairless)



Ciliate



Axial or Axillary



Scabrous



Sericeous



Setae
(long bristle)



Stellate



Strigillose



Strigose



Tomentose



Velutinous



Villous

FLORAL SYMMETRY

ACTINOMORPHIC

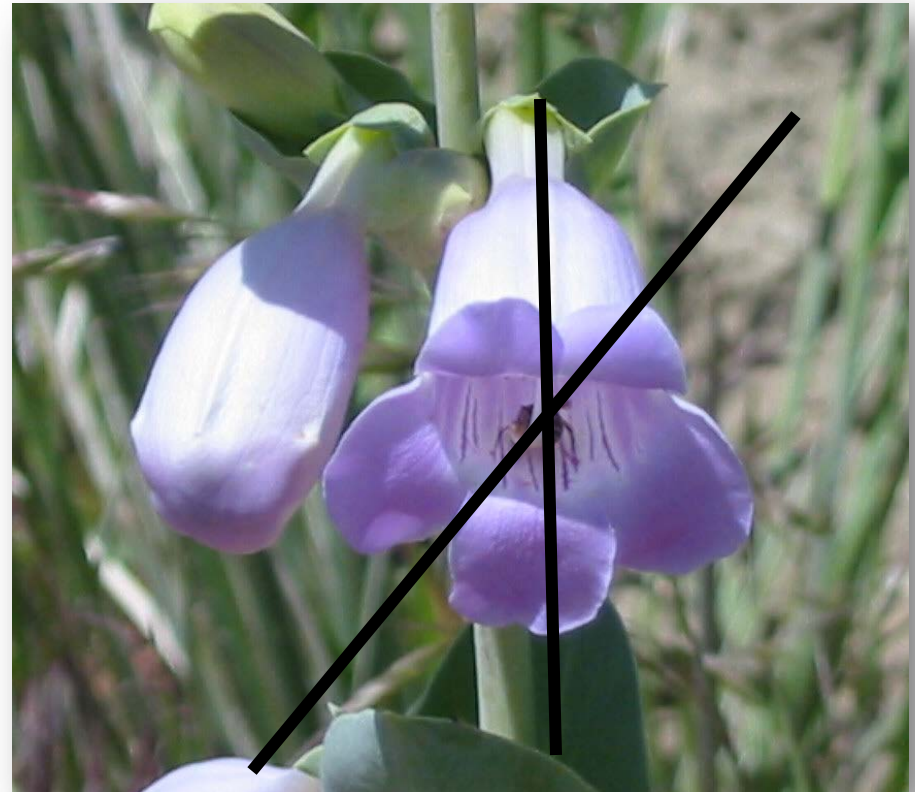
RADIAL



Ball cactus (*Pediocactus simpsonii*)

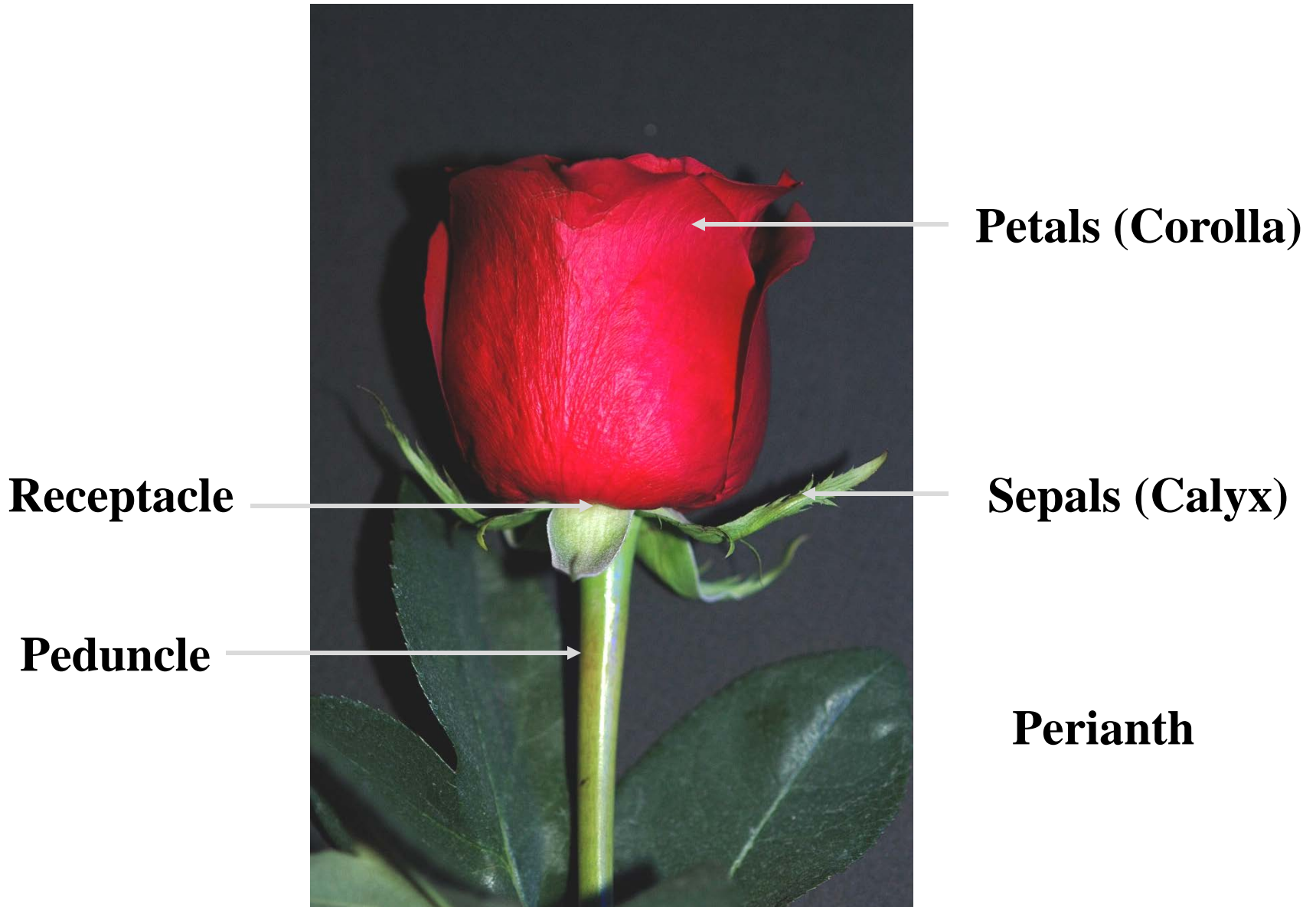
ZYGOMORPHIC

BILATERAL



Large beardtongue (*Penstemon grandiflorus*)

Parts of a Flower



Parts of a Flower



Stigma

Style

Ovary

**Carpels
Female**

Anther

Filament

**Stamens
Male**

INFLORESCENCE TYPES



CORYMB

New Jersey tea
(*Ceanothus herbaceus*)



SPIKE

Fourwing saltbrush
(*Atriplex canescens*)



RACEME

Chokecherry (*Prunus virginiana* var. *melanocarpa*)



CATKIN

Coyote willow (*Salix exigua*)



FASCICLE

Mountain mahogany
(*Cercocarpus montanus*)



CORYMB OF HEADS

Rabbitbrush (*Ericameria nauseosus*)



CYME

Virgin's bower
(*Clematis ligusticifolia*)



SOLITARY

Ball cactus
(*Pediocactus simpsonii*)

Fruits



Mountain mahogany (*Cercocarpus montanus*)

ACHENE



Douglas fir (*Pseudotsuga menziesii*)

CONE



Yucca (*Yucca glauca*)

CAPSULE



Hackberry (*Celtis reticulata*)

DRUPE



Rocky Mtn. maple (*Acer glabrum*)

SAMARA



Goldenbanner (*Thermopsis divaricarpa*)

LEGUME



Thimbleberry (*Rubus deliciosus*)

AGGREGATE

Master Naturalist Plant ID



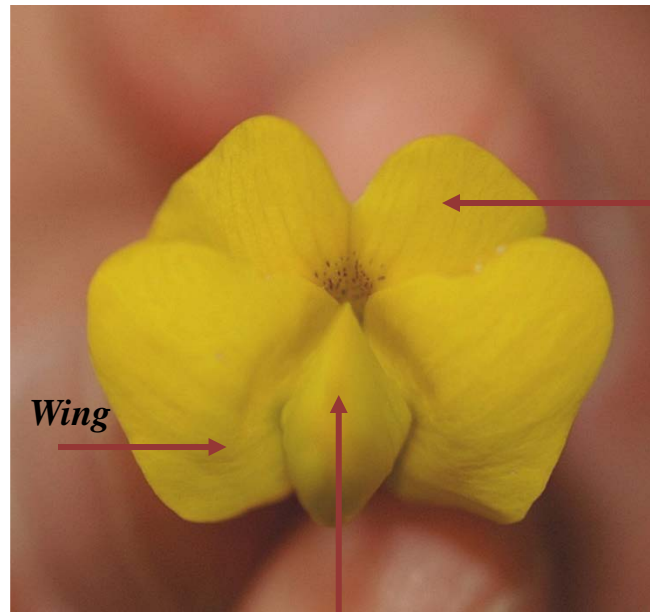
Leaves alternate, ternately compound, palmate, stipulate; leaflets with entire margins.

Inflorescence a raceme; flowers zygomorphic, papilionaceous; petals 5, yellow; stamens 10, distinct.

Fabaceae Family Characteristics

Herbs, shrubs or trees; flowers zygomorphic; leaves compound; fruit a legume or loment.

Fruit a legume, sessile, pods widely spreading, curved, glabrous or nearly so.



Wing

Banner or Standard

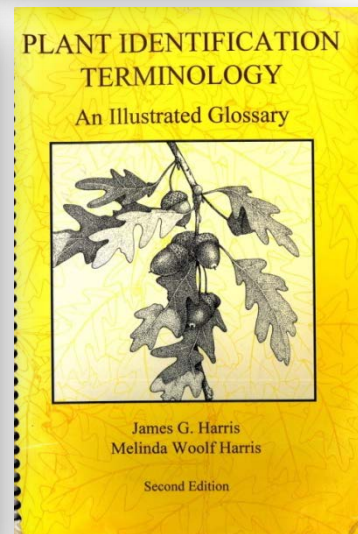
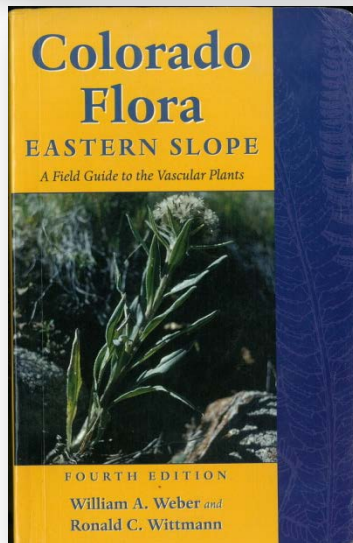
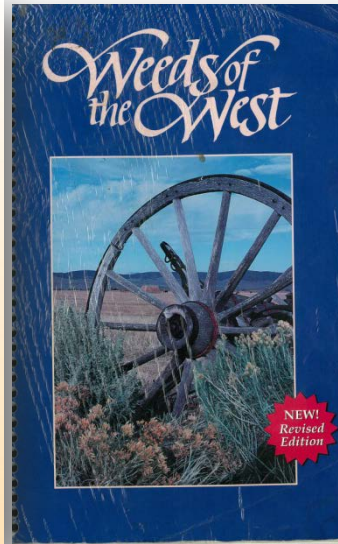
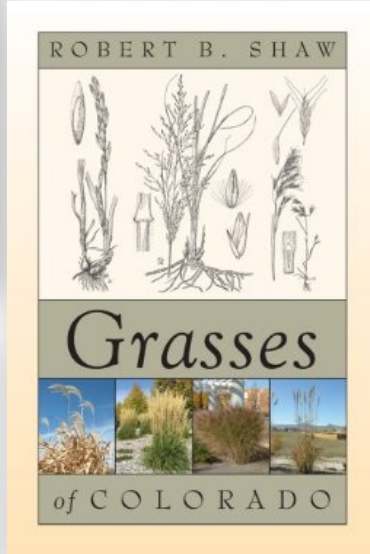
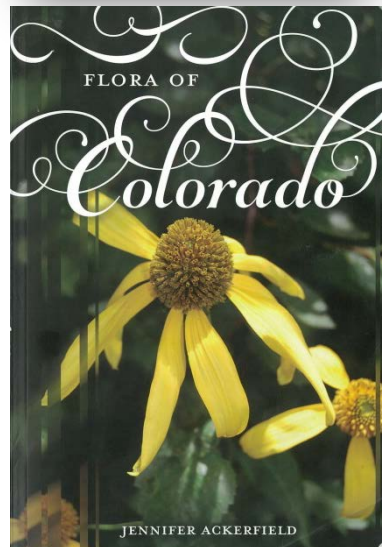
Calyx

Keel



Golden banner (*Thermopsis divaricarpa*)
Herbaceous, perennial with showy flowers; blooms April-June.

Helpful Hints!



Learn Your Plant Families

Photographs, Line Drawings

Look at Many Parts

Take Multiple Keys

Key Backwards

Local Herbaria

Bring a Friend

Ring Binding

Read the Entire Couplet

Try Again!



When Teaching Your Own Plant Class

Humans “Out” and Animals “In”

Collecting Plants is Illegal

Start Preparing Early

Walk Your Route and Tag Plants

Be Certain of Your ID

Stay On Trail

Scientific Names or Not?